SELF-CONCEPT, LEARNING STYLES AND SCHOLASTIC PERFORMANCE OF GRADE 9 MATHEMATICS LEARNERS IN MODULAR DISTANCE LEARNING MODALITY

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ABSTRACT

This quantitative research study was conducted to determine the level of the mathematics learners' self-concept and learning styles in relation to scholastic performance in modular distance learning modality. A modified survey questionnaire was distributed to *180* respondents. The respondents of the study were the Grade 9 mathematics learners who were enrolled during the school year 2021-2022 within integrated schools of Polomolok 5 District, Division of South Cotabato. Along the process made, statistical tool was used such as frequency and percentage distribution, mean, and Pearson-r. The results revealed that among the indicators of self-concept, only organized self-concept implies the no significant relationship between the scholastic performance and the level of self-concept of the Grade 9 mathematics learners. Furthermore, the study revealed that among the learning styles of the learners, visual and kinesthetic learning styles were found significantly related between the scholastic performance and the extent of learning styles of the Grade 9 mathematics learners. With this, learners' self-concept and learning styles affects their scholastic performance. It is recommended that the learners should focus on developing their full potentials to navigate their perspectives.

Keywords: learning styles, self-concept, scholastic performance, descriptive- correlation method, Polomolok 5 District, South Cotabato Division

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Chapter I

THE PROBLEM AND ITS SETTING

Introduction

Teachers and students who appeared to be eerily similar were baffled by the possible effects on teaching and learning, months after the pandemic was declared. Face-to-face classes have been largely replaced by digital and online delivery modes, mixed delivery modes, synchronous or asynchronous delivery modes, or a combination of all of these alternative learning delivery modes. As a result of the Junior High School (JHS) survey, the modular distance learning approach of teaching and learning has been used since the beginning.

The Department of Education (DepEd) pioneers an approach to education that is accessible, relevant, and liberating, while also being innovative and resourceful in delivering quality education. Through the modular distance learning modality, one of the four *(4)* delivery learning modalities given by the agency, DepEd ensures that learners have safe learning opportunities. By this, the DepEd wants to develop highly competitive learners to grasp their full potential and acquire extra knowledge and skills that improve their academic performance by developing their concept and understanding their different learning styles.

This research hopes to make a difference. It concerned with identifying learners' styles of learning and self-concept in the context of the

new normal. This was considered to be in response to the learners' challenges in mathematics even during pandemic. As a result, once learning frameworks are identified, teachers will have basic information to use in making preparations for subjects to teach. Even if a pandemic occurs, students must first understand the subjects that are known. Teachers' methods or techniques should also indicate the learners' styles of learning and self-concept. Understanding and applying advanced technologies is a new issue in education. Personal learning styles knowing the learners' learning styles assists the teacher in developing a curriculum to address the various needs of the learners in a group or class.

Self-concept is how people perceive themselves. It is one-of-a-kind, dynamic, and ever-changing. The self-image of a person defines their identity, personality, and body image. Self-concept, as a global perception of oneself, shapes and describes who we are, the judgements we make, and the interrelations we form. Self-concept may be the foundation of all intrinsically motivated behavior. The ideal self, the public self, and the real self are the three fundamental components of self-concept.

In previous years, Insorio and Olivarez (2021) viewed that students learn lessons via self-learning modules in modular remote learning; the most widely used learning delivery technique. The first grading period employing students fail to master mathematics lessons independently when using self-learning modules. They found that modular learning for students in learning

Mathematics is much more complicated than regular classes. A learner's preferred method of acquiring additional knowledge for efficient learning is referred to as their learning style. Dunn and Dunn (1978) as cited in Sana (2015) defined learning style as the distinct way in which students learn new and challenging knowledge. Learning style refers to how learners learn rather than what they understand.

An Individuals' self-concept is their perspective of themselves, such as their feelings or level of confidence in accomplishing various academic assignments. When a child is recognised, endorsed, treated with respect, and loved while in school, they can acquire a self-acceptance and regard attitude (Awan, Noureen, & Naz, 2011). Self-concept is described as persons' self-assuredness in them, as per Wang and Lin (2008), cited in Chen, Yeh and Hwang (2013), and the levels of individuals' self-impact whether or not he or they will be able to perform academic activities successfully.

According to Taheri, Zandi, and Honarparavan (2012), people have distinct learning styles. They found a significant association of students' communication habits and self-concepts concerning learning styles. The four primary learning styles are visual, auditory, tactile, and kinesthetic, and were used simultaneously by the learners at Marawi State University. The majority showed *78%* of the respondents (Bangcola, 2016).

This is especially true in the case of basic education in the Philippines,

as evidenced by the overall performance result of high school students. Since 2010, the National Achievement Test (NAT) results have been decreasing in public high schools across the country (Valdez, 2016). NAT is one of several criteria used in the country to evaluate participants' academic performance in mathematics. The Philippine NAT results continue to demonstrate the importance of developing mathematics teaching- learning process in the country.

In the local setting, the rural environment of Polomolok *5* District is affected by the COVID-19 where selected schools, including Klinan Integrated School, Viray-Lising Integrated School, and Polo-Creek Integrated School are offering modular distance learning modality as basis for the learning enhancement of the learners. Academic achievement, in addition to learning styles and learner self-concept, is a subject of concern in teaching methods. Achievement research has progressed from simple issues of competence and prior school performance to how learners engage with learning resources and methodologies.

Statement of the Problem

This study aimed to determine the mathematics learners' self-concept and learning styles to scholastic performance in Modular Distance Learning Modality in Polomolok 5 District for the school year 2021-2022.

Specifically, it answered the following questions:

1. What is the level of self-concept of the Grade 9 mathematics learners in terms of:
    1.1. learned self-concept;
    1.2. organized self-concept; and,
    1.3. dynamic self-concept?
2. What is the extent of learning styles among Grade 9 mathematics learners in terms of:
    2.1. visual learning styles;
    2.2. auditory learning styles;
    2.3. tactile learning styles; and,
    2.4. kinesthetic learning styles?
3. What is the level of scholastic performance of the Grade 9 mathematics learners?
4. Is there a significant relationship between the scholastic performance and the level of self-concept of the Grade 9 mathematics learners in terms of:
    4.1. learned self-concept;
    4.2. organized self-concept; and,
    4.3. dynamic self-concept?
5. Is there a significant relationship between the scholastic performance and the extent of learning styles of Grade 9 mathematics learners in terms of:

5.1. visual learning style;

5.2. auditory learning style;

5.3. tactile learning style; and,

5.4. kinesthetic learning style?

Hypotheses

The following null hypotheses were tested at *0.05* level of significance:

Ho_1: There is no significant relationship between the scholastic performance and the level of learned self-concept of the Grade 9 mathematics learners.

Ho_2: There is no significant relationship between the scholastic performance and the level of organized self-concept of the Grade 9 mathematics learners.

Ho_3: There is no significant relationship between the scholastic performance and the level of organized self-concept of the Grade 9 mathematics learners.

Ho_4: There is no significant relationship between the scholastic performance and the extent of visual learning style of the Grade 9 mathematics learners.

Ho_5: There is no significant relationship between the scholastic performance and the extent of auditory learning style of the Grade 9 mathematics learners.

Ho_6: There is no significant relationship between the scholastic performance and the extent of tactile learning style of the Grade 9 mathematics learners.

Ho_7: There is no significant relationship between the scholastic performance and the extent of kinesthetic learning style of the Grade 9 mathematics learners.

Significance of the Study

This study may provide additional information on self-concept and learning styles, specifically on the following beneficiaries:

School Administrators. This study is a good starting point for developing programs that may assist and guide teachers and learners. The result of the study may give more awareness to the school administrators that provide clear insights into mathematics learners' self-concept and learning styles among Grade 9 learners. This study may help them lessen their time and effort in implementing this research. They may be able to solve problems involving learning styles and self-concept in modular learning through this study. Also, this study may give the administrators a constructive critique of this study.

Teachers. This study may help the teachers figure out their learners' learning styles preferences. Moreover, this may also provide one of the teacher's guides in introducing training, offering materials, and offering

options in evaluation. This study may give technical assistance in guiding and delivering learners' performance. This study may help them incorporate the proper learners' self-concept and learning styles.

Learners. This study may help the learners determine their mathematics self-concept and learning styles as motivation for the learners to study. Indeed, they may learn to take advantage of their strong learning style when concentrating on new educational tasks. This study may give them a meaningful and informative learning process. They may provide them with additional information that may guide the learners in participating in activities by knowing one learning style and self-concept.

Parents. This study may provide adequate information for the appropriate assistance in their children's investigation. This study may give support to their children in developing their full potential as a learner. This study demonstrates the perseverance and eagerness of the learners to acquire learning.

Researcher. This study may give avenue in finding out the learning styles of the students to what styles they are capable of. This study may consider the self-concept of the learners they could implement in their classes. This study suggests the need to focus on the development and enhancing learners’ whole being.

Other Researchers and Future Studies. This study may provide information that enables other researchers and future studies to determine

the significant relationships of self-concept and learning styles to the learners' scholastic performance. This study may provide additional background on the different learning styles and self-concept of the learners.

Scope and Limitations

This study focused on the self-concept, learning styles, and scholastic performance of Grade 9 mathematics learners in a modular distance learning modality. The self-concept in modular distance learning modality level of the Grade 9 mathematics learners were delimited to the following categories; self-concept was divided into three categories: learned self-concept, organized self-concept, and dynamic self-concept. The learning styles of Grade 9 mathematics students in the modular distance learning modality were as follows: visual learning style, auditory learning style, tactile learning style, and kinesthetic learning style.

The total respondents of the study were one hundred eighty *(180)* Grade 9 learners who were chosen and currently enrolled in the following public schools: Klinan Integrated School with fifty *(50)* learners, Polomolok-Creek Integrated School with ninety *(90)* learners and Viray-Lising Integrated School with forty *(40)* learners under Polomolok *5* District, South Cotabato Division.

Chapter II

REVIEW OF RELATED LITERATURE

This chapter discusses the review of related literature and studies, which have direct bearing on the study.

Theoretical framework

This study is anchored on the Self-Concept Theory. Descartes was the first to introduce the concept of self. Rashid, Iqbal, and Khalid (2015) were the second to reintroduce self and ego theories as experimental positivism, including personality, identity, consciousness, perceptible ego, ego engagement, and ego striving. Personality theory, developed by Rogers, is a theory that is relevant to this subject (McLeod, 2014).

By far, Rogers (1947), who created an entire philosophy of assisting structured around the value of the self, was the most important and articulate voice in self-concept theory. According to Rogers, the self is a necessary element of human personality and behavioral adjustment. The self is a product of society that emerges from interpersonal relations and strives for consistent performance. He also believed that everyone has a sense of personal and growth, as long as it is permitted and assisted by a welcoming environment (Purkey & Schmidt, 1987).

The learning style theory of Kolb's inventory; has been used in numerous research investigations to determine learning styles (Kolb, 1981).

Experiential approach learning is defined as the development by which information over the conversion of knowledge in this experiential approach. According to Mayer and Massa (2003), rather than forecasting students' ability to achieve, the LSI was better suited to enable students to study their learning styles. Fahy and Ally (2005) cited in Çakıroğlu (2014) used Kolb's LSI in two distances learning using asynchronous interactions. One of the most extensively utilized learning style surveys for establishing adult learning styles is Kolb's Learning Style Inventory (LSI). The four dimensions are substantial experience (feeling), thoughtful analysis (seeing), reasoning (thinking), and active investigation (doing).

A study from Subang, Jawa Barat, Indonesia (Delima, Rahmah, & Amam, 2018) discussed that several factors, such as mathematics self-concept, can contribute to the success of mathematics learning. According to certain studies, mathematics self-concept is linked to mathematics achievement. Meaningful learning can help students develop their performance.

Based on the theories of self-concept and learning styles, this study aims to know the importance of understanding and developing learners' potential, especially in academics. These theories explain how relevant learning styles and self-concept are to each other. Learners are involved in different learning strategies that enable them to acquire additional skills and knowledge to enhance their performance in school. When learners develop

their full potential within themselves, like understanding their personality and socializing with others, they can develop their learning styles because of the influence of their surroundings.

Self-Concept

Sincero (2012), self-concept has three essential aspects in assessing learners' performance. Self-concept is learned, described as the perception that an individual in society is much more reliable than others; self-concept is organized; this aspect is the stereotyping of learners' abilities may reinforce this mindset; self-concept is dynamic, when a learner encounters various situations in life, his personal views may differ depending on the type of type of scenario and how he reacts to those situations.

According to Peteros, Gamboa, Etcuban, Dinauaonao, Sitoy, and Arcadio (2020), self-concept in mathematics is a student's appraisal of their talents, aptitude, happiness, and love of learning, which was seen as a significant factor in their school performance. A positive self-concept has a motivating influence on students, which may help them get higher grades. Learners' self-concept may be formed based on the norms and values of their family and peer groups. Self-concept may also assist them in defining themselves by allowing them to compare their functioning to that of others, allowing them to manage their desires. According to Sincero (2012), self-concept is a product of socialization.

This study aligns with the findings of Dramanu and Balarabe (2013), which found a significant correlation between self-concept as learned and dynamic and academic achievement in *1470* Ghanaian junior high school pupils. The study by Awan, Noureen, and Naz (2011) cited in Peteros et al. (2020) looked at achievement and its relation to achievement self-development and self. According to the findings, scholastic achievement is most closely related to achievement self-esteem and motivation as dynamic.

A study from Subang, Jawa Barat, Indonesia, discussed that mathematics self-concept can contribute to the success of mathematics learning. According to certain studies, mathematics self-concept is linked to mathematics achievement. Meaningful learning can help students improve their performance. Teachers who pay attention to each student's learning style will achieve meaningful learning during the learning process. As a result, mathematics self-concept and learning styles are two crucial factors ensuring that learning processes are successful (Delima et al., 2018).

Students' self-perceptions of their academic ability play a significant role in their school transition. These self-perceptions have a considerable impact on how students approach their educational work. According to Shavelson and Bolus (1982) cited in Jones (2012), self-concept is multifaceted, layered, defined and measured, description and evaluative, stable, and context-specific.

According to Dramanu et al. (2013), self-concept is multidimensional, centralized, ordered and organized, analytical and critical, stable, and situational. Furthermore, academic self-concept is a quantification of a student's views based on anecdotal evidence and assessments of school-related activities, which results in the formation of specific approaches, sentiments, and ideologies about a student's rational strengths in the academic context.

Guay, Ratelle, Amelie, and David (2010) cited in Peteros et al. (2020) found that kids with an excellent academic self-concept get improved marks since they are more driven to do well. Learners with low self-confidence, on the other hand, avoid math homework because they recognise it as a threat, resulting in poor performance.

Researchers have consistently noticed an increasing relationship between educational self-concept and scholastic performance (Ross, Scott, & Bruce, 2012); (Sarouphim & Chartouny, 2016). According to Ercikan, Lapointe, & McCreith (2005) cited in Lee and Kung (2018), students' mathematical assurance was the highest analyst of academic achievement, while their orientations towards mathematics were the significant predictor of involvement in innovative mathematics classes.

Timmerman, Van Luit, and Toll (2017) examined the association between mathematics self-concept and mathematics achievement of *108* respondents, aged *12* to *14* year old pupils from a Dutch secondary school.

They discovered a significant positive association between students' assessment, relationships, numbers, and scale self-concept and performance in all four mathematical domains.

According to Othman and Leng (2011) cited in Peteros et al. (2020), students' organized self-concept and scholastic achievement have a negative and insignificant relationship, as do students' intrinsically motivated and school performance, and students' identity and academic achievement have a negative and insignificant relationship. Previous research has found that several critical elements influence student academic achievement, including self-concept such as organized, innate drive, and self-determination, both directly and indirectly. Aside from this association, other aspects are necessary but not as well-known as contributing to learners' success.

Learned Self-Concept. Self-concept is a skill that can be learned. Individuals develop and change their self-concept, influenced by their surroundings (Zimmerman, 2013). Similarly, when children observe the common belief that men are better at math than girls, they are more likely to form an opinion based on what people perceive to be accurate (Sincero, 2012).

Lee and Kung (2018) investigated the significance between mathematics self-concept and mathematics performance among Taiwanese high school learners using organizational equivalence modeling. They

discovered that the kids' math self-concept and performance differed significantly by gender. Boys exhibited more self-esteem than girls, and girls did better in mathematics than boys. Similarly, multiple regression analysis was utilized by Ajogbeje (2010) cited in Peteros et al. (2020) to examine the relationship of self-concept and scholastic performance among *450* secondary learners in Ekiti State. According to the data, there was a considerable correlation between self-esteem and mathematics achievement.

The learners' self-concept has to be developed, especially in doing and understanding mathematics problems. Learners with a strong self-concept are much more likely than students with a low self-concept to complete their activities successfully. Students' self-concept influences their grades positively because students with a better educational self-concept are more motivated to do well in school (Tavani & Losh, 2003) as discussed by Peteros et al. (2020). Students with low self-esteem, on the other hand, avoid classwork because they interpret it as a threat, resulting in poor performance.

Individuals' self-concepts also aid them in attributing and giving significance to events (Dorner, 2017). According to McLeod (2008) cited in Ambikar and Mathur (2017), self-concept allows people to identify themselves and gives personal attributes towards others. Such knowledge may offer learners an intellect of which they are, what they are capable of, and what their lives represent.

Organized Self-Concept. The self-concept is organized. Although there are many ways to look at the learners, one observation will assist the individual in arranging these perceptions. When a person's behavior is consistent with who he is, the idea remains attached to him, making it difficult to change his mind, but it is possible. Students who believe they are valuable in mathematics and perform well in school are more likely to have a favorable attitude toward it. If students perceive mathematics to be a challenging subject and their examination and achievement results are wrong, they will feel they will fail in the field. The stereotyping of learners' abilities may reinforce this mind-set (Sincero, 2012).

Guay et al. (2010) cited in Peteros et al. (2020) developed the Perceived Competence Scale in French to assess academic self-concept. This mechanism had a *7* point scale and four items (for example, "I have difficulty doing my schoolwork properly" – contrary scoring; "As a student, I had also established very good skills and knowledge; I do not believe that I am a very talented student" – contrary scoring; "Over-all, I believe that I am a good student" – contrary scoring); "Over-all, I believe that I am a good student" – reverse scoring). For this measure, T1 and T2 had Cronbach Alphas of *0.78* and *0.74*, respectively. These scores were substantially associated (above *0.54)* with official report card grades for students. These findings align with earlier research on the relationship between learners' self-concept and academic accomplishment.

Self-concept is multidimensional, classified, planned and structured, expressive and evaluative, established, and yet more context-specific, according to Dramanu et al. (2013). Furthermore, academic self-concept is an assessment of students' understandings from personal experiences and understandings of school activities, which results in the formation of influenced attitudes, states of mind, and perceptions about one's knowledge and academic abilities based on the educational setting (Sincero, 2012).

Seaton, Parker, Marsh, Craven, and Yeung (2013) found that students who are driven and have a positive academic self-concept can manage difficulties in mathematics. Although there is strong evidence linking learners' self and performance, there is fewer evidence linking self-efficacy and achievement.

Learners' self-perceptions of their school performance are critical in their actions to modify to their school engagements, because these perspectives may control the level of effort students put in to accomplish their schoolwork (Farrington, Roderick, Allensworth, Nagaoka, Keyes, Johnson, & Beechum, 2012). Students who are less optimistic about finishing their work will perform worse academically, according to Ryan & Patrick (2001) cited in Peteros et al. (2020). Students who have a strong sense of identity in their field, on the other hand, are more likely to strive for excellence in any related tasks that are assigned to them. It affects their academic performance. Better

student performance has been linked to a better educational self-concept as a result (Khalaila, 2015).

In a study of *200* senior high schools from the Ibadan Metropolis, Kamoru and Ramon (2017) employed random sampling to examine the association between self-concept and mathematics achievement. The students completed a *30*-item multiple-choice achievement test and a *20* item mathematics self-concept questionnaire. There was also a strong link between the children's self-esteem and their math performance. As a result, they advised that teachers should help students build a good self-concept about mathematics and give an enjoyable learning involvement to help students improve a positive self-concept and develop their math performance.

Dynamic Self-Concept. The self-concept is dynamic. Individuals' perspectives may differ when confronted with various scenarios in life, depending on what type of problem they face and how they react appropriately to those situations. Individual reactions were based on how individuals view themselves in a given scenario, with the inclination to let go of things inconsistent with who they are and hang on to things consistent with who they are and beneficial in establishing a more encouraging personal presence. Students' educational experiences shape their self-concept in any academic subject, particularly those that most students consider difficult (Sincero, 2012).

According to the self- improvement paradigm, students' self-worth is component of academic achievement. This study implies that academic achievement stems from a better educational self-image. According to the experiential learning idea, academic self-concept is the product of academic achievement. According to experiential learning approach, improving pupils' academic self-concept develops intellectual accomplishment (Lui, Wang, & Parkins, 2010 cited in Yorke, 2013). When these two models were compared, it became clear that the causation is in one way. This has sparked a lot of debate among scientists. The common effects concept originated as a concession between the self-development and skill improvement approaches. According to this approach, academic self-concept and accomplishment are mutually related and reinforcing. Previous academic accomplishment influences future academic self-concept, and prior performance affects a student's educational personality (Green, Nelson, Martin, & Marsh, 2006) cited in Akomolafe, Ogunmakin, and Fasooto (2013).

The majority of students struggle with subjects just like Math. As a result, when learners engage in mathematics, they will understand the issue more confidently. This study will improve pupils' self-confidence in their ability to learn the material (Gbollie & Keamu, 2017). Teaching practices that narrow the achievement gap between pupils could help students do better in school (Sincero, 2012 cited in Peteros et al., 2020).

The self-concept of a person is their perspective of themselves. It

could be interpreted as a person's feelings or level of confidence in accomplishing various academic assignments. When a child is acknowledged, endorsed, treated with respect, and loved during the educational process, they can develop a sense of self-acceptance and regard (Awan et al., 2011) cited in Peteros et al. (2020). Self-concept is described as "persons' self-assuredness in themselves" (Wang & Lin, 2008). The levels of individuals' self-impact on whether or not they will be able to perform academic activities successfully.

According to Chen, Chiu, and Wang (2014), their study aimed to see how academic self-concept influences the application of learning strategies that lead to academic success. The linear structural relation (LISREL) which has *8.80* equation modeling software was used to analyze the data from *407* national implementing inclusive education students in Taiwan. The study's results were as follows: learners' self has a positive and significant effect on the deep, area, and strategic strategies, and also academic ability; systematic decision mediated a favorable association among self-concept and learners' achievement; and strategic decision has a significant beneficial influence on student accomplishment, whereas indication of the potential has a negative and significant effect. This guidance system shapes a person's perceptions of themselves, and their surroundings, directing action and allowing individuals to take a stance in life. Over-all, these findings suggest that higher-level educators can use positive reinforcement to help students

enhance their student engagement, efficiency, and self-concept and recognize self-learning and meta-cognitive abilities. These findings could help students choose the most efficient learning methods and improve their grades.

Learning Styles

Every human being can learn if they are given the right tools. Everyone has the right to know according to his or her own needs and preferences (Zapalska & Brozik, 2006 cited in Moussa, 2014). In their study, it is essential to improve modular learning effectiveness by offering education suited to each student's learning style. Learners can enhance their learning strategies by applying different learning styles.

There has been a lot of interest in building educational experiences based on different learning styles in recent years. Learning styles are among the essential aspects of detecting individual differences. As a result, traditional internet learning environments have given way to constantly update flexible e-learning platforms based on more innovative learning methodologie (Ozyurt & Ozyurt, 2015). The impact of adapting training and teaching to precise learning style preferences on learning outcomes has been studied and argued for years. Many topical evaluations have determined that the meshing concept is unsupported by facts and persisting neuromata in education. However, the idea is still used in educational situations and favors many academics (Aslaksen & Loras, 2018).

Ahmad, Mulalic, and Shah (2009) cited in Bangcola (2016) said that lecturers' teaching styles and students' learning styles should be matched to improve teaching and learning competencies. Most people believe they understand because they attended a course or read a book that explained the idea. Visual-Auditory-Kinaesthetic is presumably how most readers are thinking. However, this isn't the only idea about learning styles. The tension between teaching and learning approaches makes it challenging for the learner to accomplish in classes (Naqeeb, 2011).

In the study of Abidin, Jafre, Helen, Kohr, and Singh (2011) as also mentioned in Abidin, Haqiki, Muryede, Wijaya, Firdaus, El Bali, and Rozi (2020), when taught according to instructional techniques, average and low achievers performed better on standardized tests. They examined the relationship between high school female learners' visual and kinesthetic learning styles and their scholastic performance. Their findings revealed a link between learners' learning styles and their academic grades. Likewise, in a more recent study of Akbari, Ghanbari, and Talab (2013), a correlation existed between these learning processes and scholastic performance of *488* students at an Iranian high school. The results indicated that learning styles should be taken into account to enhance learners' success.

Similarly, Orhun (2012) investigated whether academic success is affected by learning style selection to determine the students' learning styles; he used David Kolb's learning styles inventory. The study discovered that the

choice of learning styles influence academic performance. According to Hariharan and Ismail (2003), as cited in Ahmad (2016), high school Malaysian students do not have distinct learning styles. The data suggested that respondents ranked kinesthetic, visual, and group learning as minor learning styles and tactile, auditory, and individual learning as negative learning styles.

One of the most significant functions of learning styles is that they enable teachers to easily integrate them into their teaching. There are various types of learning styles. Students can absorb information in three ways: visual, auditory, and kinesthetic (Vaishnav, 2013). Accordingly, a recent classification of learning styles is divided into visual, aural, and kinaesthetic (Ahmad, Shah, Shenoy, & Srikant, 2013).

Studies globally pay attention to the significance of learning style in improving learners' educational experiences at Sohar University (SU), one of the Sultanate of Oman's premier private universities. The majority of the professors conduct courses in a conventional passive manner. However, the university encourages students to engage in more active learning (Hamdani, 2015).

According to Costa, Souza, Valentim, and Castro (2020), Distance Education (DE) in conjunction with the use of Virtual Learning Environments (VLE) as instruments for student-teacher interaction has grown into a large research area all over the world. Learning efficacy in VLEs techniques

explores connections between pedagogical advances and pedagogical technological solutions in VLEs. In this context, this study aimed to link the Learning Styles theory to Distance Education students' behavior by monitoring their engagements with the Virtual Learning Environment and connecting them to their learning style as indicated by the “Cuestionario Honey-Alonzo de Estilos de Aprendizaje” (CHAEA) questionnaire.

Some people prefer the way to learn, especially during the pandemic. Many schools provide online, modular, or blended courses to increase their instructional approaches with distance learning courses to answer today's learners' different distance and time needs. They concentrate on specializing or customizing systems to meet the needs of students. Learners' demands include a variety of learning methods that might affect learning outcomes (Hamilton, 2002) cited in Çakıroğlu (2014).

According to Farkas, Mazurek, and Marone (2015) study about health care education, the Visual, Auditory, Reading/ Writing, Kinesthetic (VARK) learning style is an instructional focus. This study investigates the association between course success and VARK learning preferences, study time, and career plans among students enrolled in a large metropolitan university's undergraduate anatomy and physiology course. Individuals prefer different learning techniques, according to experts. In many circumstances, how things are presented has a more significant impact on learners' accomplishments than what was taught. Learning styles are an essential part

of learning development (Abbas, 2012).

According to Ehrman and Oxford (1990) as cited in Song (2011), one of the most critical aspects that could promote tailored or modified training that aids learners' learning and develops their performance is their learning styles (Liu, Kuljis, & Lines, 2007) cited in Zhang, Huang, Liu, Yin, Li, Yang, and Xia (2020). Individual differences in preferred or habitual techniques of cognitive functioning and working with new knowledge (Joy & Kolb, 2009) cited in Zhang et al. (2020) and individual variances in choice are referred to as learning styles. Learners enter the learning process with their unique characteristics, like learning styles, methods, and personality types, according to (Abdullah, Sadeghi, Kasim, & Tan, 2012). If instructors give a variety of instructional activities focused on the VARK model, students will be able to learn more efficiently.

The majority of learning style definitions concentrate on how people learn. According to Hawk and Shah (2007) cited in Schulze and Bosman (2018), learning style is a person's preferred technique of accumulating, structuring and thinking about new learning. It has been defined as behaviors that lead to mental health problems and knowledge and affective perspectives of teaching and learning set-up interaction. Learning styles are defined more by students' tactics to deal with learning and are less constant. Cognitive types, on the other hand, are pretty consistent. As a result, learning styles, rather than learner preferences, can be expanded over time.

A current evaluation of the system works on learning styles revealed no indication to back up the claim that instructional strategies that match people's learning styles produce the most significant results. Several types of research refute this assertion. People have strong feelings about their learning preferences (e.g., graphic, kinaesthetic, natural), but it's less obvious whether or not these feelings matter (May, 2018).

According to Gonzales and Reyes (2016), teachers must take into account the learning styles of their students. To do so, the instructor must plan the lesson so that it integrates activities that satisfy the needs of the pupils. It is the instructor's responsibility to support all students with different learning styles to make the teaching method more relevant.

The internal motivation of pupils might be based on individual differences in self-concept (McDonough & Ramirez, 2018). Learning styles are established on reasoning, affective, and psychological characteristics that influence how people engage with and respond to their learning setting (Duff & Duffy, 2002) cited in Marica, Pengerb, Todorovic, Djuricic, and Pintar (2015). Visual learners learn through seeing, auditory learners through hearing, and physical learners through moving and touching (Jazuli, Solihatin, & Syahria, 2019).

In the first stage, one of the most challenging aspects of academic life is dealing with students from various cultures and areas (Menekse & Tinkir, 2019). The observation channel model, often known as the VAK (Visual-

Auditory-Kinesthetic) model, is based on the primary observation channels of humans. When the term tactile is combined with the kinesthetic category, the paradigm is referred to as Visual-Auditory-Kinaesthetic-Tactile (VAKT).

Visual Learning Style. Visual learners prefer written notes, diagrams, and illustrations as study tools. Image is everything to a visual learner. In order to fully comprehend a class's content, they must pay attention to the teacher's movements and facial expressions. To avoid visual impairments, they prefer to sit in the front of the classroom. They frequently choose to take extensive information (Sana, 2015). Visual learners benefit from studying with their eyesight. Visual learners are said to need to be able to see and read. They can benefit from photographs, tabular, demonstrations, hand - outs, and mind maps. The most effective learning method is to read course materials, reading materials, and other printed text. It is easy to incorporate those elements into the educational setting, allowing visually impaired students to use and study in a virtual setting (Sana, 2015).

As the name implies, when visual learners use their human perception, they learn best. They develop an early interest in reading and reciting, starting with storybooks and quickly progressing to textbooks. Bright colors and clear illustrations captivate them, and they can learn from video content, demonstrations, and classroom handouts. Visual learning is the most comparable to traditional pedagogical approaches of the three different types of learning. Reading works, taking and evaluating personal notes, and

the use of flip charts, illustrations, and other visual aids by many teachers can aid visual learners in understanding (Mead, 2020).

According to Raiyn (2016), visual skills development necessitates information designed for and supported by visual tools. A representation is defined mathematically as the substitute for an argument in a function. It's simply a mapping relationship in which inputs and current states are mapped to future states and outputs in the same way. A function is an object representation, and there is always an implied correlation to behavior.

Images, illustrations, flow diagrams, time lines, videos, and demonstrations help visual learners recognize what they see. Charts, concept art, mock-ups, portraits, process flow, or any other graphical demonstration of primarily verbal course content are extremely beneficial to their learning. They use concept maps to list key points and encircle them in boxes or circles, with lines drawn to show connections between concepts (Pallapu, 2007 cited in Akdemir, 2013).

Visual learners think of it in terms of illustrations and learn best when visual images are used. They rely on non-verbal body language and facial expressions from the instructor or facilitator to gain a clearer understanding. Visual learners may prefer to sit near the front of the room. They also take extensive notes on the material being presented (Syofyan & Siwi, 2018).

Auditory Learning Style. Auditory learners will sit and listen to the conversation before writing down their thoughts. They will benefit from

reading study materials aloud rather than simply looking at them. They learn best through oral lectures, debates, and active listening. They decipher the underlying meanings by paying attention to the voice, the pitch, and speed of speech. These students frequently benefit from reading slowly and clearly and employing a tape recorder (Sana, 2015).

Students that learn best by hearing (aurally) will benefit from virtual learning if video clips, virtual lectures, and video conferences are available, as auditory learners value listening and speaking. The buckles are straightforward to include in the surroundings. Auditory learners like to hear explicit instructions spoken aloud. They can only concentrate on one subject at a time. Listening to lectures and participating in conversations are beneficial to auditory learners (Raiyn, 2016).

Auditory learners are said to be exceptional listeners according to Kayalar and Kayalar (2017). Auditory learners have qualities such as obtaining information through listening rather than reading or writing and preferring listening to reading or writing (Kayalar & Kayalar, 2017). Like hearing aids, auditory-type learners rely on the success of their learning through their ears. Students with an auditory learning style might learn more quickly by engaging in verbal discussions and listening to what the teacher says (Malik, 2019).

An auditory learning style is one in which a person learns by listening. Auditory learning style is defined by Coffield, Mosdey, Hall, and Ecclestone

(2004) cited in Gogusa (2016) as a method of learning in which students learn by having listened to tapes, communication devices, and lectures They went on to say that auditory learners learn primarily by hearing and talking. In a similar vein, they emphasized that auditory learner's process information best when it is spoken to them. According to Vincent and Ross (2001) cited in Gogusa (2016), auditory learners benefit most from group discussion methods.

Auditory learners are classified into two types. They place emphasis on spoken messages. This classification, which has less grasp, wants to understand their voices in order to fully comprehend the information. The first is the most common type, "listeners", who are more likely to perform well in school. The same is true for them outside of school. They can also show intellectual modification of concepts and gain knowledge on how to remember other people's words (Khan, Arif, & Yousuf, 2019). Auditory learners learn by listening to a set of information and interpreting it with pitch, greater focus, and speed. These learners gain knowledge through reading aloud in school and may not properly understand written information (Syofyan & Siwi, 2018).

The second classification is classified as "talking it out" and is frequently required to communicate to those around them. Having heard oral processors gradually comment like muttering to talk in a classroom setting when the facilitator is not asking questions. They appear to be

troublemakers; one cannot deny this, but they believe it is important to speak. Some researchers refer to these students as "interactive," emphasizing the importance of listening to both themselves and everyone else (Khan et al., 2019).

Tactile Learning Style. Tactile learners enjoy manipulating materials and taking notes with their hands. The most effective method for these students to learn new content is to work on a laboratory experiment. Such kids may benefit from writing notes or directions to help them retain material more efficiently and physically, student engagement plays a vital role in their retention of information (Sana, 2015).

According to Sener and ÇOkçaliskan (2018), hands-on learning is ideal for this learner. To learn about things, they like to touch them. They frequently highlight what they read, take notes while listening, and engage their hands in various activities.

Tactile learners must touch or try anything similar to fully grasp the concept. This learning style is commonly known as multi-sensory learning since tactile learners comprehend or even seek to learn and then complete their learning by doing it themselves. Auditory and visual learning, on the other hand, require learners to see or hear directions in order to comprehend them (Khan et al., 2019).

Also, tactile learners enjoy manipulating things. Because they love simulations, exploratory activities, and problem-solving, laboratory or hands-

on learning approaches are best. The focus of sensory modality preferences is on extending learners' strengths and broadening their variety of modalities rather than matching learning and teaching methods. Faculty can do this by engaging students in various activities and requiring them to complete assignments in a variety of formats (Stephenson, 2019).

Kinesthetic Learning Style. According to Putintseva (2006) and Danchak et al. (2005) cited in the study of Sana (2015), kinesthetic learners enjoy utilizing their physique, hands, and sensory organs to actively participate in their learning. They learn best by doing things themselves and actively investigating the physical world. They may struggle to sit quietly for long periods and get easily distracted.

The kinesthetic learning style can access any type of motion or emotion, whether created or remembered. This learning style emphasizes coordination, rhythm, emotional reaction, and physical comfort. Students who arere highly kinesthetic can be classified as follows: for starters, students are constantly touching each other, standing in close proximity and moving around a lot. Second, learners know more by indicating things while reading and physically responding (Syofyan & Siwi, 2018).

The kinesthetic technique was the most popular, monitored by tactile and auditory. The learning styles of pupils and teachers were not compatible (Naqeeb, 2011). He added that the kinesthetic learning style is dominant among the learning styles. Feeling and experimenting are the best ways for

kinesthetic learners to these students enjoy physical experiences such as touch, feel, holding, doing, and practice of professional backgrounds.

Manipulatives are tangible physical devices that children can use to learn hands-on. In the study of Cockett and Kilgour (2015), *32* students participated in various mathematics activities involving multiple types of manipulatives and activities in which manipulatives were not utilized at all. Clocks, currencies, MAB blocks, and the interactive board were manipulatively employed. A survey was used to obtain quantitative data, and qualitative data in the form of experiences was also collected. The findings revealed that when students are manipulative, they are more engaged, and their assessment of their classroom environment improves in terms of enjoyment, understanding, and efficiency.

Kinesthetic or physical and perceptible learners choose to use their good judgment, intelligence, and logic to solve the problem at hand. Learners who prefer to touch rather than see and hear are more likely to succeed. Even when discussion or written materials are ineffective for kinesthetic or physical learners, they intend to extend lesson planning and seek assistance from pictorial forms and labs. As a result, these types of students cannot thrive in traditional classroom settings (Khan et al., 2019).

Kinesthetic learners prefer to learn through an active performance and hands-on method. These students enjoy working with people with their surroundings. Kinesthetic learners frequently struggle to stay on track and

can become easily distracted. Kinesthetic students exhibit movement, synchronization, rhythm, emotional feeling, and physical comfort (Syofyan & Siwi, 2018).

Scholastic Performance

In recent years, divergence in intellectual achievement and fluency requirements has resulted from government influence over standardized tests. According to the National Center for Education Statistics (NCES), approximately *20%* of states changed annual assessment standards between 2007 and 2009. Based on the NCES, *21* of *34* cases where guidelines were modified resulted in more research evaluations than in previous years. These changes make it more difficult to compare state competence levels and assess advancements in educational accomplishments from previous years (Flores, 2019).

Filipino students' math ability needs to improve, according to Capuno, Necesario, Jonathan, Espina, Padillo, and Manguilimotan (2019), as evidenced by the 2016-2017 Global Competitiveness Report. The Philippines was placed *79th* out of *138* countries in terms of science and math educational standards. This study is consistent with the results of the Department of Education's (DepEd) National Achievement Test (NAT), which revealed that the overall average score in mathematical concepts was *48.63%*, substantially below the minimum of *50*% set by the DepEd. To address these concerns, factors influencing students' Math performance

must be investigated; otherwise, the country's educational development the situation will deteriorate. To address these issues, an assessment of the present state of the problem must begin in the classroom.

Flores (2019) claims that statistical reports show that students' mathematical abilities deteriorated. The NCAE results over the last five years have been highly concerning high - stakes standardized academic ability and achievement tests, such as the NSAT, reveal students' weak areas; additionally, the results reveal poor achievement in mathematics. Furthermore, NAT results (national assessments taken by learners about to begin their college careers) demonstrated a decline in incompetence, with an average score of *50.70%* throughout 2004-2005, *47.82%* through 2005-2006, and *46.37%* through 2011-2012, which appears unattainable when compared to DepEd's goal of *75%*.

Only *19%* of Filipino students met the minimal benchmark in mathematics, which means they had "some basic mathematical knowledge," while *81%* did not. "They can add, subtract, multiply, and divide whole numbers with one and two digits." They are able to solve simple word problems. They are familiar with simple fractions and geometric patterns. Students can read and fill out simple bar charts and tables. "The assumption that math is a difficult subject magnifies the state of mathematical concepts education in the Philippines. Some students are unwilling to engage in and hesitant to learn about the subject, and rather than being questioned, they

have accepted that they will perform poorly.” Furthermore, students' inability comprehending and recognizing mathematical concepts and strengthening abilities leads to poor mathematics achievement, poor specific knowledge and skills performance, and poor academic success (Flores, 2019).

The parental involvement in their child's school performance impacts their mathematics achievement. According to Mertens (2011), students who have the guidance of their parents perform better academically and are more likely to graduate from high school than students who do not have parents involved. This finding was corroborated by Latterell (2015), who stated that students with parents who are interested in their children's education perform better in school. The involvement in a child's education is regularly proven to be favorably associated with their academic success.

Research Gap

Based on Bangcola's (2016) study, the four primary learning styles, visual, auditory, tactile, and kinesthetic were used simultaneously by the students at Marawi State University. The majority of them *(78%)* preferred kinesthetic learning style while having little or no preference for peer learning styles. However, Bangcola did not show the students' choices at Marawi State University regarding the visual, auditory, and tactile learning styles. In addition, learners' mathematics aspects in self-concept were not discussed.

The future study aims to correlate the mathematics self-concept and learning styles to the Grade 9 mathematics learners' performance.

Delima et al. (2018) studied learners' learning styles and mathematics self-concepts of high school students of Subang Jawa, Barat, Indonesia. The study correlated the learners' learning styles and mathematics self-concept. In this study, the researcher aims to correlate the self-concept, learning styles to the Grade 9 mathematics learners' scholastic performance in Modular Distance Learning Modality.

Based on the study of Vaishnav (2013), there are three learning styles in which the learners can incorporate learning- visual, auditory, and kinesthetic. However, the author did not mention the tactile learning style, one of this study's most essential learning styles. In connection with the author's study, the learners' learning styles were correlated to the scholastic performance of the *200* students of the *9th*, *10th*, and *11th* classes of Maharashtra State. However, the author includes the mathematics self-concepts of the learners because he only focused on the academic achievements. Thus, the researcher is interested in studying secondary school students' learning styles and scholastic performance.

Definition of Terms

For a clearer understanding of the study, the following terms are operationally defined:

Auditory Learning Style. It is characterized by students' learning styles that prefer to interpret information by listening to a tape recorder or radio. These students enjoy conversation and dislike long periods of silence. If they are not actively engaging in the class discussion or discussion, it is tough to maintain their attention. Music is preferred by auditory learners for working or studying.

Dynamic Self-Concept. It is defined as individual reactions based on how they view themselves in a given scenario, with the inclination to let go of things inconsistent with who they are and hang on to things consistent with who they are and beneficial in establishing a more favorable personal being.

Kinesthetic Learning Style. It is defined as the learning style of learners who have preferences in interpreting the information through actual participation. Individuals with this thinking style are frequently restless or hyperactive due to their consistent need for movement. Anyone who taps their foot while pondering or frequently gestures while speaking is an example of this.

Learned Self-Concept. It is defined as self-concept when the learners believe what they know and understand based on society's perception.

Learning Styles. It refers to how learners understand, process, and retain new comprehensive understanding using their visual, auditory, tactile, and kinesthetic senses.

Modular Distance Learning Modality (MDLM). This approach refers to the learning delivery that requires learners to learn independently at their own pace. Operationally, MDLM defines purely module paper as the basis to identify learners' learning style and self-concept.

Organized Self-Concept. It is defined as when a person's behavior is consistent with who they are, the implication tends to stick with them, making it difficult, but not impossible, to change their perception.

Scholastic Performance. It is defined as the academic achievement of Grade 9 learners, school year 2020-2021. The respondents' performance was the basis to correlate self-concept and learning styles in MDLM.

Self-Concept. It is defined as students' evaluation of talents, abilities, enjoyment, and interest in the subject, which is viewed as a severe facet of their success. This study refers to how learners apply and understand through learned, organized, and dynamic aspects.

Tactile Learning Style. It is defined as the learning style of learners who prefer touching, moving, creating, or drawing things for easy access in learning. Learners engage in these learning activities if they are doing something physically.

Visual Learning Styles. It is defined as students' learning style who prefer to present information through aids and visual materials. They are skilled at memorizing diagrams, charts, and images, and tend to visualize even abstract ideas in order to better understand them.

Conceptual Framework

The Department of Education offers four learning deliveries; Modular Distance Learning Modality, Online Distance Learning Modality, Blended Learning Modality, and Radio-Based Instruction (RBI). Students can continue their schooling despite the pandemic (Llego, 2021). However, teachers learn differently and can apply the modular distance learning modality convenient to the students' learning to improve their performance. Appropriate educational instruction is used to educate learners how to implement self-learning modules (SLMs) in print or digital template copy, depending on the learner's context. Learners are also expected to actively respond in the teaching-learning process by using modular learning delivery, which is one of the main objectives of this study.

This study aimed to identify the self-concept and learning styles of Grade 9 mathematics learners from Klinan integrated School, Polomolok-Creek Integrated School, and Viray-Lising Integrated School in Polomolok *5* District. Also, this aimed to determine the self-concept and learning styles of their scholastic performance.

Figure 1 shows the schematic diagram of the study. The independent variables are the mathematics self-concept, which are classified as learned, organized, and dynamic; and learners' learning styles, which are classified as visual, auditory, tactile and kinaesthetic. The dependent variable is the Grade 9 mathematics learners' scholastic performance.

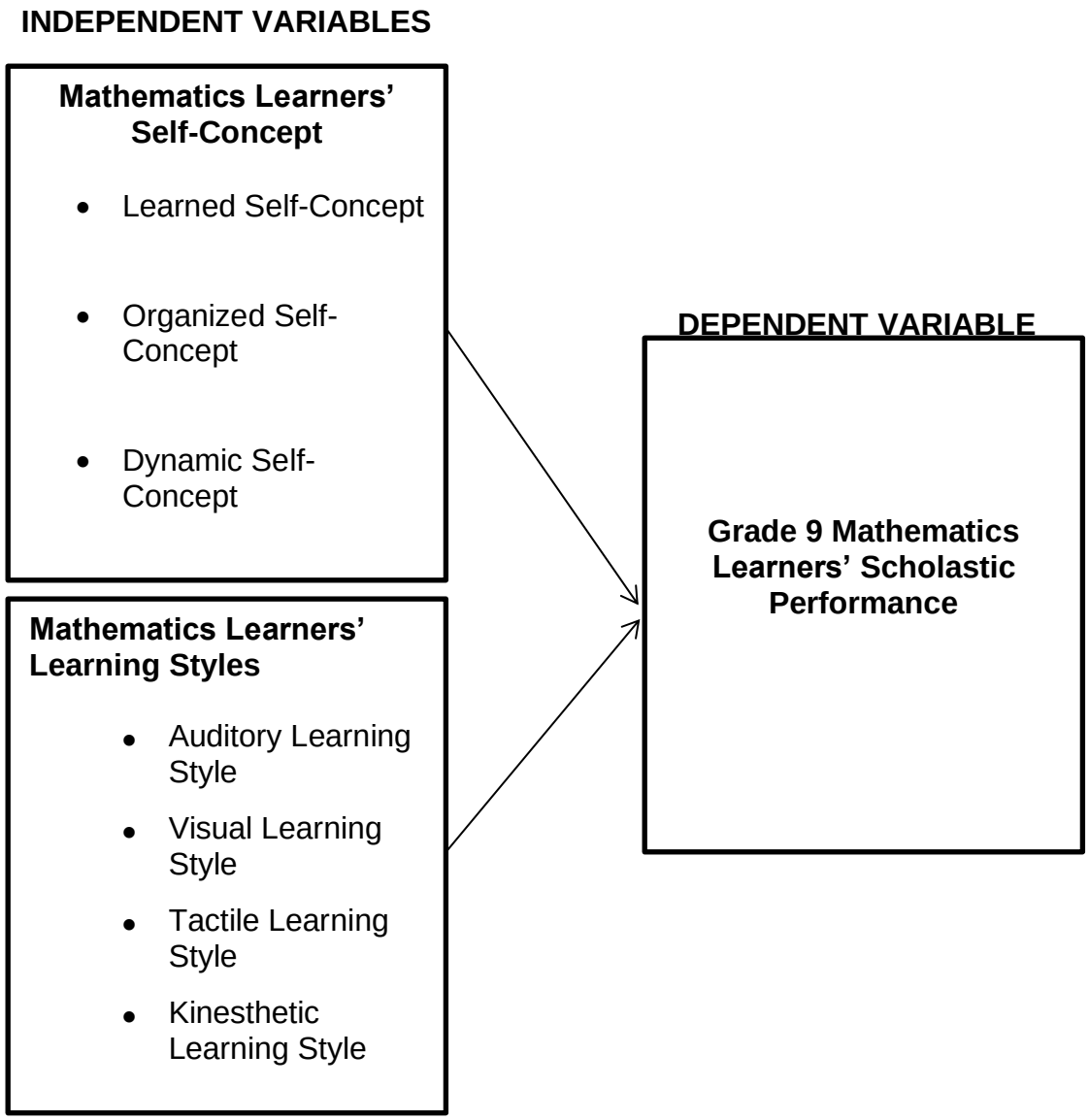

Figure 1. Conceptual Framework

Chapter III

METHODOLOGY

This chapter presents and discusses the methods and procedures done in this study. It includes research design, locale, respondents, instrument, data gathering, analysis, and statistical treatment.

Research Design

Quantitative research focuses on interpretive stress measurements and numerical, mathematical, or analysis of data obtained via questionnaires and surveys, as well as developing pre-existing statistical data using computing tools. Around 1250 A.D., quantitative research first appeared and was inspired by researchers who needed to accurately measure data. It is one that approaches research design numerically or statistically. The assumption of an empiricist paradigm underpins quantitative research methodology (Creswell, 2002) cited in Hu and Chang (2017).

The researcher utilized the descriptive-correlation method of research. Quantitative research is the process of gathering, evaluating, and interpreting a study's findings. This study found the visual, audio, tactile, and kinesthetic learning styles (Creswell, 2002) cited in Hu and Chang (2017). The self-concept identified is the learned, organized, and dynamic self-concepts of Grade 9 learners in mathematics. These are correlated to the Grade 9 mathematics performance.

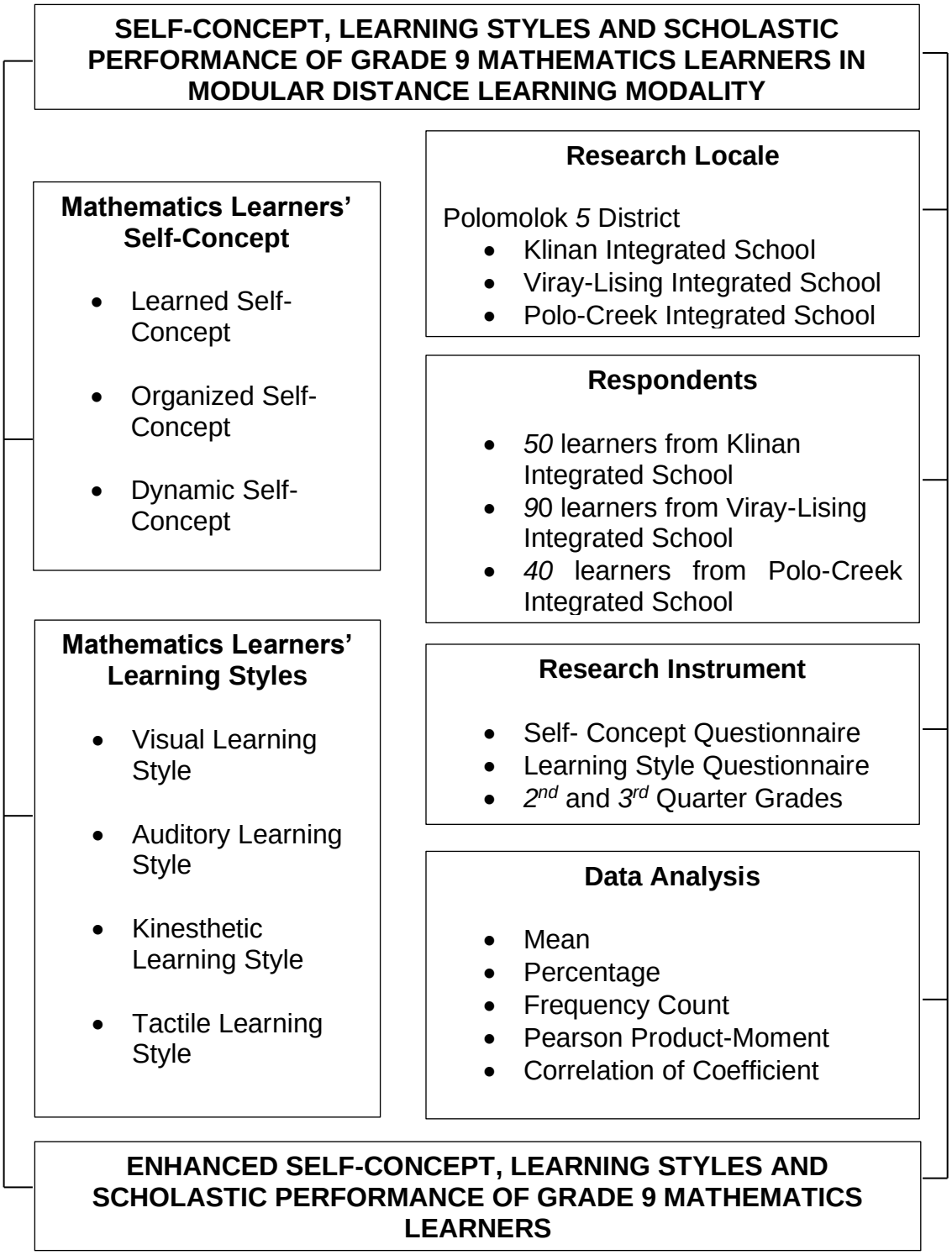

Figure 2. Research Design

Research Locale

The researcher conducted a study in Klinan Integrated School, Polo-Creek Integrated School, and Viray- Listing Integrated School. These schools are under the Integrated Schools of Polomolok *5* District, Division of South Cotabato. Klinan Integrated School headed by Ronald T. Tudlasan, Principal-I, is a public institution located at Purok Malipayon, Barangay Klinan 6, Polomolok, South Cotabato with School ID 501233. Viray-Lising Integrated School headed by Hermie F. Dumayas, Principal-I, is a public institution located at Purok 1, Barangay Glamang, Polomolok, South Cotabato with School ID 501846. Polomolok-Creek Integrated School headed by Ruth L. Prudente, Principal-I, is also a public institution located at Barangay Magsaysay, Polomolok, South Cotabato, with School ID 501198.

These are the public schools wherein learners learn in an environment that is child-friendly, gender-sensitive, safe, and motivating. All students and staff require a safe and supportive school environment to achieve this. A safe school is one in which teaching and learning is not disrupted.

The most effective strategy to ensure safe and supportive school environments necessitates a comprehensive, coordinated effort that includes tactics at the school, district, and community levels. School surroundings should promote academic achievement, social cooperation, and overall well-being.

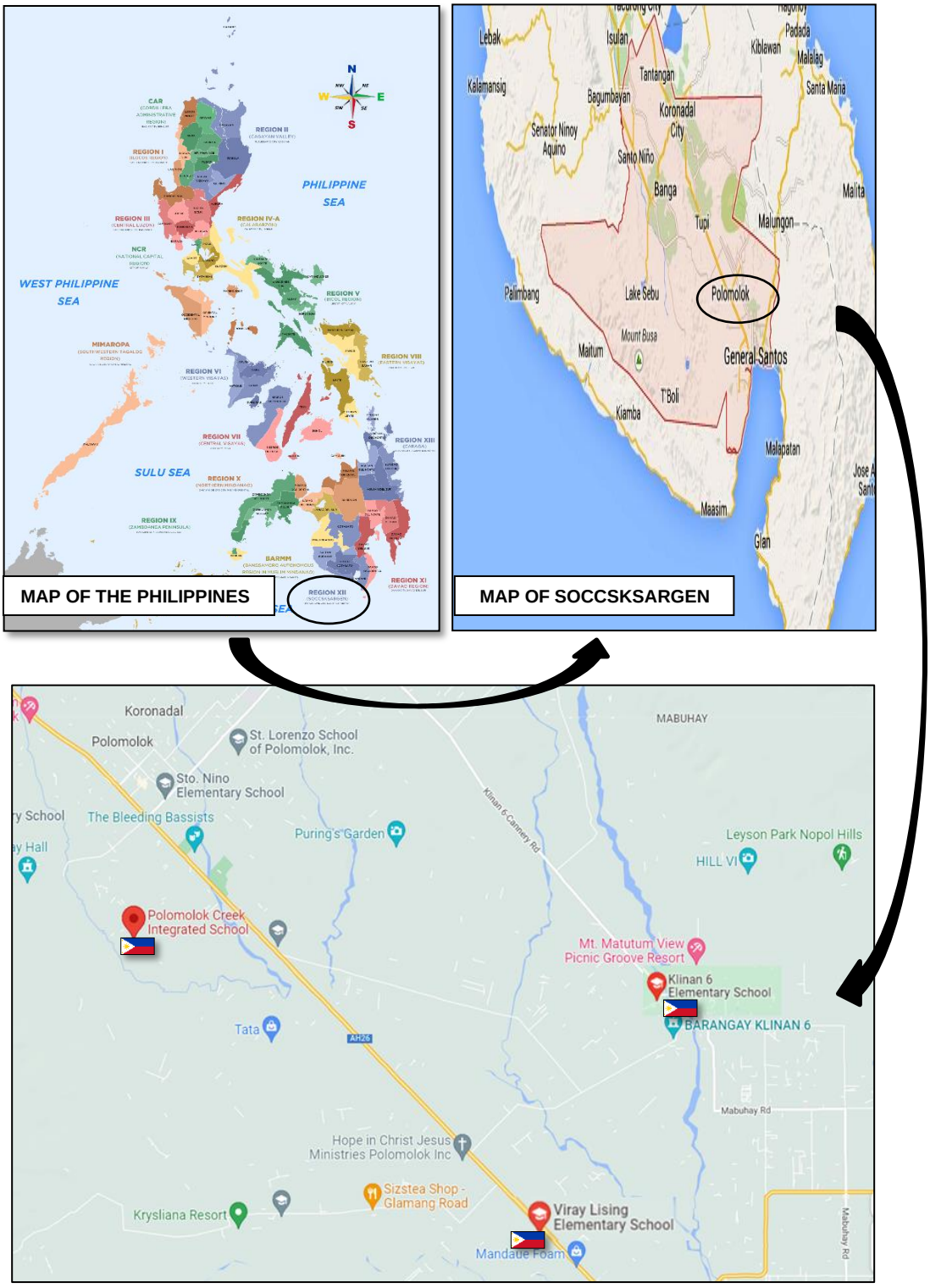

Figure 3. Map of the Locale of the Study

Respondents

The respondents of this study were one hundred eighty *(180)* learners who were chosen using a complete enumeration to answer the survey on Self-Concept and Learning Styles in Modular Distance Learning Modality. The learners are enrolled online through the Learners' Information System (LIS) during the school year 2021-2022 in Klinan Integrated School, Polo-Creek Integrated School, and Viray- Listing Integrated School.

The researcher decided to follow the complete enumeration method where students of the population are the study's respondents. In the distribution of the respondents, Klinan Integrated School had fifty *(50)* respondents, Viray-Listing Integrated School had ninety *(90)* respondents, and Polomolok-Creek Integrated School had forty *(40)* respondents.

Research Instrument

The researcher adopted and modified the questionnaire of Kvedere (2012). The said instrument consists of *15* items used to determine the self-concept of Grade 9 mathematics learners of selected Integrated Schools of Polomolok *5* District. There were *5*-item questions each for learned self-concept, organized self-concept, and dynamic self-concept. The data for this study were gathered via a survey questionnaire. They asked to rate each statement regarding how well it described their mathematical self-concepts.

The reliability of the study was calculated by using the Cronbach's

Alpha formula. The alpha coefficient for the three indicators of self-concept is *0.848* or *84.8%*, suggesting that the items have relatively excellent internal consistency. Since the value of Cronbach Alpha was above *0.7* or *70%*, all items were deemed reliable.

The questions were answered using the following scale description:

Mean Range	Description	Interpretation
4.50-5.00	Very High	The learners have exceptional self-concept.
3.50-4.49	High	The learners have remarkable self-concept.
2.50-3.49	Moderately High	The learners have good self-concept.
1.50-2.49	Low	The learners have average self-concept.
1.00-1.49	Very Low	The learners have poor self-concept.

In the conduct of this study, the researcher adopted and modified the questionnaire of Rabba (2011). The said instrument consisted of *20* items used to determine Grade 9 mathematics learners' learning styles of selected Integrated Schools of Polomolok *5* District.

The reliability of the study was calculated by using Cronbach's alpha formula. The alpha coefficient for the four indicators of learning styles was *0.864* or *86.4%* suggesting that the items have relatively excellent internal consistency. Since the value of Cronbach's Alpha was above *0.7* or *70%*, all

items were deemed reliable.

The questions were answered using the following scale description:

Mean Range	Description	Interpretation
4.50-5.00	Always	The learners display a very high evident learning style.
3.50-4.49	Frequently	The learners display a high evident learning style.
2.50-3.49	Often	The learners display a moderately evident learning style.
1.50-2.49	Sometimes	The learners display a somewhat evident learning style.
1.00-1.49	Seldom	The learners display a not evident learning style.

The average of first and second quarter grades of Grade 9 mathematics learners during the school year 2021-2022 served as the basis of their scholastic performance. The following scale and description was used based on the DepEd Order No. 8, s. 2015.

Grading Scale	Description	Interpretation
90-100	Outstanding	The learners display a very high proficient performance in Mathematics.
85-89	Very Satisfactory	The learners display a high proficient performance in Mathematics.
80-84	Satisfactory	The learners display a moderately high proficient performance in Mathematics.

75-79	Fairly Satisfactory	The learners display a somewhat high proficient performance in Mathematics.
74 below	Did Not Meet Expectations	The learners display a not proficient performance in Mathematics.

Data Gathering Procedure

Before gathering the data, the researcher asked the adviser for substantial assistance, from changing the title and revision of the literature to guiding the researcher. The adviser gave necessary information about the researcher's study, set meetings, and provided additional knowledge that the adviser to the researcher can impart. When the paper was done, checked, and validated by the adviser, the researcher then set a schedule with the Dean of the Graduate School Program for the proposal defense. After the plan of the proposal defense was all set, the researcher defended his study about "Self-Concept, Learning Styles, and Scholastic Performance of Grade 9 Mathematics Learners in Modular Distance Learning Modality".

In gathering the data, the researcher asked permission from the school principal through a letter to conduct a study in their respective schools. The letter of intent was approved, and the researcher coordinated with the grade nine advisers in the selected integrated schools to assist in administering the questionnaire to the learners. Since Polo-Creek Integrated School, Klinan Integrated School and Viray-Listing Integrated School are COVID-free schools, the researcher gathered the respondents in their

respective schools. The researcher explained the study's objectives and clarified the general directions before answering the questionnaire. The respondents were given thirty *(30)* minutes to finish answering all the items in the questionnaire and retrieve them after the allotted time. The respondents' *2nd* and *3rd* quarter grades in the school year 2021-2022 were obtained from their respective classroom advisers who kept their report cards, respectively.

After gathering the data, the researcher asked assistance from the statistician to tabulate the study results. And after the study was approved by the panelists and the Graduate School program, the researcher's study was published.

Data Analysis

This study used the complete enumeration research method in selecting the Grade 9 mathematics learners in selected integrated schools of Polomolok *5* District. The data gathered were tabulated, analyzed, and interpreted.

To determine the learners' self-concept level in terms of learned, organized and dynamic self-concepts of the Grade 9 mathematics learners in Modular Distance Learning Modality, the mean was used.

To determine the extent of the learners' learning styles in terms of visual, auditory, tactile, and kinesthetic learning styles of the Grade 9 mathematics learners in Modular Distance Learning Modality, mean was

used.

To determine the level of scholastic performance of the Grade 9 mathematics learners, percentage frequency, and mean were used.

To determine the relationship between the scholastic performance and the level of self-concept such as learned self-concept, organized self-concept, and dynamic self-concept of the Grade 9 mathematics learners, Pearson Product- Moment, and correlation of coefficient were used.

To determine the relationship between the scholastic performance and the extent of learning styles such as visual, auditory, tactile, and kinaesthetic learning styles of the Grade 9 mathematics learners, Pearson Product Moment, and correlation of coefficient were used.

Ethical Considerations

The researcher ensured that he followed all of Holy Trinity College Council of Ethics' ethical considerations. It assisted him in avoiding practices that could implicitly or explicitly abuse those on whose behalf he sought to conduct research with.

The researcher did not force the respondents to complete the questionnaire and ensured that all personal information provided by respondents was kept confidential. Because of the COVID-19 pandemic, protocols were followed in conducting the research, particularly in face-to-face interviews/ surveys.

Informed Consent. Prospective participants were informed of the study's objective, procedures, and observed potential benefits, as well as their privilege to willingness to participate, the potential to revoke and terminate consent at any time, the autonomy to hide information, and the privacy of the information, prior to participation, and provided full permission to participate. It used no inducement or stress to encourage learning study participation. The survey participants gave the researcher their permission.

Voluntary Participation. When determining whether something is entirely voluntary, the economic situation of prospective respondents must be considered to determine which safeguards should be implemented to safeguard the exercise of free will. The amount of effort required to define perceived behavioral control varies and is determined by a number of factors, including the respondents' ability to resist persuasion through cash rewards, government bureaucracy leadership, or other means. When survey participants have a limited ability to refuse, extra vigilance is required to avoid extra stress (both real and perceived).

Data Privacy Act. All information required for the study was included in the research instrument, so no permission to access confidential details was required. All personally identifiable information was kept strictly confidential. It was safeguarded against unauthorized access, use, modification, theft, or loss. The collected data was securely locked in the researchers' personal cabinet and stored on a password-protected computer.

The researcher may or may not publicly release personal details in the participant information sheet and research instrument. To protect participants who chose to disclose such information, the researcher assigned a numeric code from data collection to the appearance and/or publication of results. The findings of the research were indicated in aggregate form. To ensure that participant personal information was protected during the research, the researcher included a confidentiality declaration in the informed consent. The researchers shred all collected information as well as the data collection instruments. Personal documents were completely deleted.

Gender Sensitivity. In this study, there was gender equality in both males and females. Learners were treated equally by the researcher, teachers, parents and even their school mates. All questions in the questionnaire were considered a non- gender-biased to avoid lapses and discrimination.

Cultural Sensitivity. Cultural sensitivity has varied connotations. Learners' comprehension and communication with teachers and parents would be improved if they had a better understanding of the term about one's culture. The researcher treats everyone fairly.

Conflict of Interest. To avoid potential compromise in the study's conduct, participants will strictly select based on the inclusion and exclusion criteria, which will ensure that they are understood prior to participating in the study. All respondents are in Grade 9 and are capable of making decisions

and giving permission. There are no financial conflicting interests in the study's conduct. The researcher is personally funding the study as an academic requirement in the MAED-Mathematics studies, and the information gathered and results were used objectively for research purposes only.

Safety and Health Protocols. Safety and health protocols maintain students and faculty to be safe while also providing learning and social opportunities. The researcher understands that individual responsibility and commitment to following health guidelines are critical to the success of research. The researcher's control is only as effective as the learners' willingness to carry it out. It was critical for everyone- faculty, staff, and students to accept responsibility for their actions and follow the rules.

Chapter IV

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter presents the results of the data gathered, the analysis, and the study's interpretation. The results on the self-concept, learning styles, and scholastic performance of Grade 9 learners are presented in the succeeding tables.

Level of Self-Concept of the Learners

The tables presented below are the results of the level of self-concept of the learners in terms of learned self-concept, organized self-concept, and dynamic self-concept.

Table 1.1

Level of Learned Self-Concept of Grade 9 Mathematics Learners

Items	Mean	Description
1. I learn the skills taught in Mathematics concepts quickly.	*3.72*	High
2. I understand Mathematics even though it poses challenging problems.	*3.29*	Moderately High
3. I am capable of making a good grade in Mathematics.	*3.66*	High
4. I do extra work to learn Mathematics.	*3.32*	Moderately High
5. I can answer every question in Mathematics.	*3.49*	Moderately High
Over-all Mean	***3.50***	**High**

Table 1.1 shows learned self-concept of Grade 9 mathematics learners. The learners learning the skills taught in mathematics concept quickly obtained the highest mean of *3.72* described as high and interpreted

as learners have a remarkable self-concept; the learners are capable of making a good grade in mathematics got a mean of *3.66* described as high and interpreted as remarkable self-concept; the learners can understand mathematics subject even if it poses challenging problems obtained a lowest mean of *3.29* described as moderately high and interpreted as learners have a good self-concept. The overall mean of the level of learned self-concept of Grade 9 mathematics learners is *3.50* described as high and interpreted as remarkable self-concept.

This study implies that the learners can adapt the learning and information taught in the subject. Learners can gain knowledge by comprehending the subject matter. This could assist them in reaching their full potential in performing and solving mathematical problems. It also develops the ideas and knowledge of the learners by enhancing and strengthening their understanding in mathematics subjects. Even when faced with difficult mathematical problems, students can conceptualize them.

The respondents' self-concept has to be developed, especially in doing and understanding mathematics problems. Students with a strong self-concept are more likely to complete their activities successfully than students with a low self-concept. Students' self-concept, which they discovered, has a positive impact on grades because students with a positive academic self-concept are more driven to do very well in school. On the other hand, students who have low self-esteem ignore school assignments because they

see it as a threat, which leads to poor performance (Tavani & Losh, 2003) as discussed by Peteros et al. (2020).

Table 1.2

Level of Organized Self-Concept of Grade 9 Mathematics Learners

Items	Mean	Description
1. I can handle difficulties in Mathematics	*3.93*	High
2. I am more enthusiastic about learning Mathematics.	*3.70*	High
3. I excel in Mathematics compared to other subjects.	*3.07*	Moderately High
4. I am good at Mathematics so I get good grades.	*3.12*	Moderately High
5. I can pass the Mathematics subject easily and it is worth passing well.	*3.56*	High
Over-all Mean	***3.48***	**Moderately High**

Table 1.2 shows organized self-concept of Grade 9 mathematics learners. The learners can handle difficulties in mathematics subject has the highest weighted mean of *3.93* described as high and interpreted as remarkable self-concept; the learners are more enthusiastic in learning mathematics got a mean of *3.70* described as high and interpreted as remarkable self-concept; and the learners excel in mathematics compare to other subjects got the lowest mean of *3.07* described as moderately high and interpreted as good self-concept. To analyze, the learners have a moderately high level of organized self-concept with the mean of *3.48* interpreted as good self-concept.

This data implies that the learners can manage to answer the mathematics subject, which provides meaningful learning. By this, learners

tend to have a good performance if they accept the challenges in the mathematics subject. A learner excelled in academe is a prerequisite to have a better and profound knowledge regarding the subject matter. Bright children who have a strong sense of logic and reasoning have a high tolerance in handling difficult mathematics problems. Having basic math skills is important regardless of the career path one chooses. That is why it is critical to identify problems early on. Every student can achieve his or her full math potential with the right combination of classroom accommodations and learning strategies.

Seaton et al. (2013) found that students who are driven and have a positive academic organized self-concept can manage difficulties in mathematics and do better academically. Although there is strong evidence that there is a link between academic self-concept and performance, there is less evidence of a link between self-efficacy and achievement. The study included *2,786* Australian high school students measured at four-time intervals six months apart. Separate models revealed reciprocal relationships between mathematics self-concept and accomplishment and between mathematics performance-approach goal orientation and achievement. As a result, they advised that teachers should help students build a good self-concept about mathematics and give an enjoyable learning involvement to help students improve a positive self-concept and develop their mathematics performance.

Table 1.3

Level of Dynamic Self-Concept of Grade 9 Mathematics Learners

Items	Mean	Description
1. I am delighted when answering Mathematics problems.	*3.85*	High
2. I am comfortable answering Mathematics problems.	*3.82*	High
3. I have retention capacities in learning Mathematics.	*3.58*	High
4. I can think fast in Mathematics problems.	*3.25*	Moderately High
5. I engage in learning Mathematics for real-life situations.	*3.98*	High
Over-all Mean	***3.70***	**High**

Presented in Table 1.3 is the dynamic self-concept of Grade 9 mathematics learners. Learners are engaged in learning mathematics for real-life situations got the highest mean of *3.98* described as high and interpreted as the learners have remarkable self-concept; the learners are delighted when answering mathematics problems got a mean of *3.85* described as high and interpreted as the learners have remarkable self-concept; and the learners can think fast in mathematics problems and have the lowest mean of *3.25* described as moderately high and interpreted as the learners having good self-concept. To interpret, the learners have a high level of dynamic self-concept with an overall mean of *3.70* interpreted as remarkable self-concept.

This data implies that the learners involve themselves in learning mathematics by relating the concepts to authentic situations that they have entered. Moreover, learners' eagerness to learn may be enhanced if they

enjoy and feel like everything is good while performing specific tasks. For the learners to have better performance in school, they need to improve their thinking capacities. Through this, learners can incorporate new information and ideas that can help them improve their interests in school.

The majority of students struggle with the subject, just as they do with Math. As a result, when learners engage in mathematics, they will understand the issue confidently. This will improve pupils' self-confidence in their ability to learn the material (Gbollie & Keamu, 2017). Teaching practices that narrow the achievement gap between pupils could help students do better in school (Sincero, 2012) cited in Peteros et al. (2020).

Table 1.4

Summary Table on the Level of Self-Concept of Grade 9 Mathematics Learners

Indicators	Mean	Description
1. Learned Self-Concept	*3.50*	High
2. Organized Self-Concept	*3.48*	Moderately High
3. Dynamic Self-Concept	*3.70*	High
Over-all Mean	***3.56***	**High**

Table 1.4 shows the summary results on the level of self-concept of Grade 9 mathematics learners. The dynamic self-concept got the highest mean of *3.70* described as high and interpreted as remarkable self-concept. The learned self-concept got the over-all mean of *3.50* described as high and interpreted as remarkable self-concept. The organized self-concept got the lowest weighted mean of *3.48* described as moderately high and interpreted

as a good self-concept. The overall mean is *3.56* described as high and interpreted as the learners having remarkable self-concept.

Extent of Learning Styles of the Learners

The tables presented below are the results of the extent of learning styles of the learners in terms of visual learning style, auditory learning style, tactile learning style, and kinesthetic learning style.

Table 2.1

Extent of Visual Learning Style of Grade 9 Learners in Mathematics

Items	Mean	Description
1. I learn better by simply reading my modules in Mathematics.	*4.04*	Frequently
2. I remember what I have studied upon reading instructions in the Mathematics module.	*4.00*	Frequently
3. I understand Mathematics questions when reading directions.	*3.94*	Frequently
4. I understand Mathematics by watching Mathematics video tutorials rather than listening to my parents, guardian or relatives' lectures.	*3.72*	Frequently
5. I learn more by reading my Mathematics modules than by listening to my parents, guardian or relatives' lectures.	*3.68*	Frequently
Over-all Mean	***3.88***	**Frequently**

Table 2.1 shows the learning styles of Grade 9 mathematics learners in terms of visual learning style. The learners learn better by simply reading my modules in mathematics with the highest mean of *4.04* described as frequently and interpreted as the learner display a high evident learning style; the learners remember what they have studied upon reading instructions in the mathematics module got a mean of *4.00* described as frequently and

interpreted as the learner displaying a high evident learning style; and learners learning more by reading mathematics modules than by listening to their parents, guardian or relatives' lectures got the lowest mean of *3.68* described as frequently and interpreted as the learner displaying a high evident learning style. To interpret, the learners' extent of visual learning style is described as frequently and interpreted as they display a highly evident learning style with an overall mean of *3.88*.

This data implies that the learners' visual learning style informed their abilities to learn the mathematics subject by simply reading and comprehending the subject matter. It is so evident that learners' techniques in learning can affect their good performance in school. Moreover, it highly encourages learners to develop their attention span from their parents in answering their modules because it can also enhance their capability and school performance. They develop an early passion for reading and reciting, beginning with picture books and quickly making progress to textbooks.

Visual learners are said to need to be able to see and read. They can benefit from photographs, charts and graphs, demonstrations, hand-outs, and visualizations. The most effective learning method is to read lecture notes, handbooks, and other printed text. It is simple to integrate those elements into the classroom environment, allowing children to interact with and learn in a simulated environment. This type of learner values thematic entities. (Sana, 2015).

Table 2.2

Extent of Auditory Learning Style of Grade 9 Learners in Mathematics

Items	Mean	Description
1. I understand Mathematics when my parents, guardian or relatives tell me the instructions.	*3.87*	Frequently
2. I can easily learn when my parents tell me how to do the activities in my Mathematics module.	*4.30*	Frequently
3. I remember things I have heard from my parents, guardian or relatives better than things I have read in the module.	*3.93*	Frequently
4. I excel in Mathematics when my parents, guardian or relatives explain the activity well in my module.	*4.07*	Frequently
5. I learn better when I listen to the instructions of my parents, guardians or relatives.	*4.15*	Frequently
Over-all Mean	***4.06***	**Frequently**

Table 2.2 shows the auditory learning styles of Grade 9 mathematics learners. The learners can easily learn when their parents tell them how to do the activities in mathematics module got the highest mean of *4.30* described as frequently and interpreted as the learner display a high evident learning style; the learners learn better when they listen to the instructions of their parents, guardian or relatives got a mean of *4.15* described as frequently and interpreted as the learner display a high evident learning style; and learners understand mathematics when their parents, guardian or relatives tells them the instructions got the lowest mean of *3.87* described as frequently and interpreted as the learner display a high evident learning style. The students' evaluation generally agreed that the learners' extent of auditory learning style is described as frequently and interpreted as they display a high evident learning style with an overall mean of *4.06*.

This data implies that the auditory learning style allows learners to identify their skills and knowledge to perform better in school. Learners can develop their learning styles by following the instructions of their parents/ guardians. By this, learners' comprehension and memory skills must improve to retain the subject. Parents have a huge influence on their children's academic success than any teacher or federal program. Parents can serve as role models by supporting their child's education. Assure them of their child's educational progress; demonstrating how important that progress is to them.

In the study of Kayalar and Kayalar (2017) about auditory learners, they said to have extraordinary skills that help them by obtaining different attributes in learning. In order to achieve such learning, learners were able to understand and gather information by listening clearly to the teachers rather than reading books or writing a story. Aural learners depend on achieving their goals in life by focusing solely on hearing materials. Auditory learners who are more engaged in verbal discussions are more motivated in learning (Malik, 2019).

The buckles are straightforward to include in the surroundings. People made a point of saying that auditory learners learn primarily by hearing and speaking. They also addressed that auditory learners take in information best when it is delivered to them. Auditory learners benefit the most from group discussion and lecture methods, Vincent and Ross (2001).

Table 2.3

Extent of Tactile Learning Style of Grade 9 Learners in Mathematics

Items	Mean	Description
1. I learn more when my parents, guardian or relatives model something about what is stated in the Mathematics module.	*4.07*	Frequently
2. I am interested learning how to learn in making activities in my Mathematics module.	*4.00*	Frequently
3. I can easily solve Mathematical problems in the module when writing or making drawings.	*4.10*	Frequently
4. I remember what I have learned when I do hands-on activities in the module.	*4.04*	Frequently
5. I enjoy learning when I explore activities in my Mathematics module.	*4.37*	Frequently
Over-all Mean	***4.12***	**Frequently**

Presented in table 2.3 shows the tactile learning style of Grade 9 mathematics learners. The learners enjoy learning when they explore activities in the mathematics module got the highest mean of *4.37* described as frequently and interpreted as the learner display a high evident learning style; the learners can quickly solve mathematical problems in the module when writing or making drawings got a mean of *4.10* described as frequently and interpreted as the learner display a high evident learning style; and they are interested in learning in making activities in the mathematics module got the lowest mean of *4.00* described as frequently and interpreted as the learner displaying a high evident learning style. The students' evaluation generally agreed that the learners' extent of tactile learning style is described as frequently and interpreted as they display a highly evident learning style with an overall mean of *4.12*.

This data implies that the learners found interest in learning through tactile learning style. The learners display relevant information that they must show an engagement to perform and explore different activities to understand the subject better. Having said this in their interests, learners involve themselves in exciting activities given. Tactile learners enjoy using their hands to manipulate materials and take notes. Working on a laboratory experiment is the most effective way for these students to learn new material. Tactile learners must touch or try something similar to fully grasp the concept. Because tactile learners apprehend or seek to learn and then accomplish their learning by performing the task themselves, this learning style is described as multi-sensory learning.

Hands-on learning, according to Sener and ÇOkçaliskan (2018), is preferred for this learning process. They want to feel and seek opportunities in order to comprehend the topic. They frequently emphasize what they read, take down notes, and perform a variety of activities with their hands.

Physical activity aids in the comprehension and retention of information. They are hands-on learners who choose to create or draw what they learn, and they learn better when they are physically active. Learners engaged in playing a vital role in their retention of information. Faculty can do this by engaging students in various activities and requiring them to complete assignments in a variety of formats such as hands-on activities and learning physical engagement (Stephenson, 2019).

Table 2.4

Extent of Kinesthetic Learning Style of Grade 9 Learners in Mathematics

Items	Mean	Description
1. I am interested in demonstrating activities found in the Mathematics module.	*4.01*	Frequently
2. I learn better when I do things at home.	*4.12*	Frequently
3. I enjoy learning at home by doing the additional activities provided in the Math module.	*3.79*	Frequently
4. I understand things better when I do it in actual performance with the help of my parents, guardian or relatives.	*3.77*	Frequently
5. I can easily understand my lessons in the module by using manipulative materials found at home.	*3.54*	Frequently
Over-all Mean	***3.85***	**Frequently**

Table 2.4 shows the kinesthetic learning style of Grade 9 mathematics learners. The learners learn better when they do things at home got the highest mean of *4.12* described as frequently and interpreted as the learners display a high evident learning style; the learners are interested in demonstrating activities found in the mathematics module got a mean of *4.01* described as frequently and interpreted as the learners display a high evident learning style; and the learners can easily understand their lessons in the module by using manipulative materials found at home got the lowest mean of *3.54* described as frequently and interpreted as high evident learning style. The students' evaluation generally agreed that the learners' extent of kinesthetic learning style is described as frequently and interpreted as they display a highly evident learning style with an overall mean of *3.85*.

This data implies that the learners engage in learning by doing

activities at home. This means that they are comfortable answering their Mathematics modules and so performance. Learners can develop their skills and knowledge to perform actual activities using different materials. Manipulatives allow students to learn concepts through developmentally appropriate practical learning experience. This is intended to help students grasp some mathematical ideas by transforming them.

Cockett and Kilgour (2015) conducted a study in which *32* students are involved in different mathematics activities that included multiple types of instructional strategies as well as activities that did not involve manipulatives at all. There are strategic materials that are helpful in engaging learning to improve teaching-learning process such as blocks, interactive games and technology devices. Based on the study, learners are more engaged and participative in every activities that are related to actual games are tend to have a better understanding which develops their character and strengthen learning environment. By this, learners have the ability to inspire and involved in a healthy learning habits.

The usage of mathematics manipulatives, the most common types, the motivations for using them, and their ramifications are examined. The potential benefits of employing manipulative mathematics resources in an appropriate and systematic manner should be conveyed to teachers. They should get adequate professional development within themselves to achieve students' learning.

Table 2.5

Summary Table on the Extent of Learning Styles of Grade 9 Mathematics Learners

Indicators	Mean	Description
1. Visual Learning Style	*3.88*	Frequently
2. Auditory Learning Style	*4.06*	Frequently
3. Kinesthetic Learning Style	*4.12*	Frequently
4. Tactile Learning Style	*3.85*	Frequently
Over-all Mean	***3.98***	**Frequently**

Presented in table 2.5 shows the summary table on the extent of learning styles of Grade 9 mathematics learners. The over-all mean is *3.98* described as frequently and interpreted as the learner displaying a high evident learning style. The kinesthetic learning style got the highest mean of *4.12* described as frequently and interpreted as highly evident learning style; the auditory learning style got a mean of *4.06* described as frequently and interpreted as high evident learning style; the visual learning style got a mean of *3.88* described as frequently and interpreted as high evident learning style; and tactile learning style got the lowest mean of *3.85* described as frequently and interpreted as high evident learning style.

Level of Scholastic Performance of the Learners

The table presented below is the result of the level of scholastic performance of Grade 9 mathematics learners during the 2nd and 3rd quarter of school year 2021-2022.

Table 3

Level of Scholastic Performance of the Grade 9 Mathematics Learners

Grade Range	*f*	%	Description
90 - Above	*38*	*21.11%*	Outstanding
85-89	*103*	*57.22%*	Very Satisfactory
80-84	*45*	*19.45%*	Satisfactory
75-79	*4*	*2.22%*	Fairly Satisfactory
70-74	*0*	*0.00%*	Did Not Meet Expectations
Total	***180***	***100%***	
Mean Percentage		***87.21%***	**Very Satisfactory**

Shown in table 3 is the summary result of the level of scholastic performance of the Grade 9 mathematics learners of the respondents from the three integrated schools of Polomolok *5* District. The results show that *57.78%* of the respondents out of *180* have a grade range of *85-89*, described as very satisfactory, and interpreted as the learners displaying a high proficient performance in mathematics. In addition, *38* respondents out of *180* or about *21.11%* have a grade range of *90*-above, described as outstanding, interpreted as the learners displaying a very high proficient performance in mathematics. There are also *19.45%* of the respondents out of *180* have a grade range of *80-84*, described as satisfactory, and interpreted as moderately high proficient performance in mathematics. Moreover, *2.22%* of the respondents out of *180* have a grade range of *75-79*, described as fairly satisfactory, and interpreted as somewhat high proficient performance in mathematics. No learner had a grade range of *70-74* described as did not meet expectations, and interpreted as that the learner

displayed not proficient performance in mathematics.

According to Capuno et al. (2019), learner performance on mathematical problems should be improved, as evidenced by the Global Competitiveness Report for 2016-2017. The Philippines was ranked *79th* out of *138* countries in terms of mathematics and science education. The overall average score on the National Achievement Test (NAT) for students was *48.63%*. This means that students in the Philippines must improve and develop their mathematical problem-solving skills in order to produce highly competitive students.

Flores (2019) claims that learners have a bare minimum of mathematical understanding. Learners can perform the four basic operations but cannot comprehend mathematical problems. They are also engaged in solving simple and easy problems. The suggestion that mathematics is a difficult subject improves the state of mathematical concepts in the Philippine education system. Learners are uninterested in learning mathematics, which causes them to be hesitant to comprehend the subject. Furthermore, a learner's inability to understand, comprehends, and analyzes mathematical concepts leads to poor subject performance, poor performance in specific knowledge and skills, as well as poor academic success. This implies that learners must perform well and participate in any mathematical activities that develop and improve their ability to understand and recognize mathematical concepts.

Significant Relationship Between the Scholastic Performance and the Level of Self-Concept

The table presented below is the result of the significant relationship between the scholastic performance and the level of self-concept of the Grade 9 mathematics learners.

Table 4

Significant Relationship Between the Scholastic Performance and the Level of Self-Concept of the Grade 9 Mathematics Learners

Variables	Scholastic Performance		
	Correlation coefficient (r)	p- value	Remarks
1. Learned Self-Concept	*0.647*	*0.000*	Significant
2. Organized Self-Concept	*0.136*	*0.073*	Not Significant
3. Dynamic Self-Concept	*0.401*	*0.001*	Significant

The correlation is shown in table 4 that the relationship between the scholastic performance and the level of self-concept of the Grade 9 mathematics learners is significant learned self-concept *(r=0.647, p=0.000)* and dynamic self-concept *(r=0.401, p=0.001)*.This data is shown by their p values which are less than *0.05* led to the rejection of the null hypothesis. This implies a significant relationship between the scholastic performance and the level of self-concept of the Grade 9 mathematics learners in terms of learned self-concept and dynamic self-concept.

This data implies that the learners can learn the mathematics subject utilizing understanding the concept and providing relevant information

regarding the subject matter. This also means that the learners' performance in learned self-concept and dynamic self-concept are high enough to cater to their understanding of quizzes, activities, and homework.

This study supports the findings of Dramanu et al. (2013), who discovered a significant relationship between self-concept as learned and dynamic and academic achievement in *1470* Ghanaian junior high school students.

Awan et al. (2011) as cited in Peteros et al. (2020) investigated achievement and its relationship to self-development and achievement. According to the findings, scholastic achievement is most closely related to achievement motivation and self-concept as dynamic. Seaton et al. (2013) discovered that students who are motivated and have a positive academic learned self-concept outperform their peers academically. Although there is strong evidence linking academic self-concept and performance, there is less evidence linking self-efficacy and achievement.

The other factor showed no significance, such as organized self-concept *(r=0.136, p=0.073)*. Therefore, it led to the rejection of the null hypothesis that implies there is no significant relationship between the scholastic performance and the level of self-concept of the Grade 9 mathematics learners according to organized self-concept.

One of the best ways that a learner needs to develop is an organized self-concept in which they should engage and focus in their school activities

to have a fruitful performance outcome. This implies that the learners are inactive and need improvement in performing well in school. In addition, learners' characteristics and personality can affect their performance in school. By enjoying things while learning, learners can excel in the subject matter, and they can create a good version.

According to the study of Othman and Leng (2011), as cited in Peteros et al. (2020), the learners' organized self-concept has a correlation with their scholastic performance, implying that learners can manage their difficulties in learning mathematics and have a bearing on their performances. On the other hand, there was no significant relationship between innate knowledge and learner achievement. This study had an impact on the learners' ability, and it was revealed that some of the learners' self-concept is as organized as their performances. Other factors that contribute to learners' success, aside from this association, are significant but less understood.

Ryan and Patrick (2001) cited in Peteros et al. (2020), discussed that a learner who is lack of interest in learning are the ones who are poor in academic. Students who are passionate about a particular topic are more likely to strive to achieve excellence in any and all tasks that are assigned to them. As a result, learners strive for excellence a positive impact on their scholastic performance which increased academic achievement is linked to a positive academic self-concept (Khalaila, 2015).

Significant Relationship Between the Scholastic Performance and the Extent of Learning Styles

The table presented below is the result of the significant relationship between the scholastic performance and the extent of learning styles of the Grade 9 mathematics learners.

Table 5

Significant Relationship between the Scholastic Performance and the Extent of Learning styles of the Grade 9 Mathematics Learners

Variables	Scholastic Performance		
	Correlation coefficient (r)	p- value	Remarks
1. Visual Learning Style	*0.494*	*0.002*	Significant
2. Auditory Learning Style	*0.239*	*0.089*	Not Significant
3. Tactile Learning Style	*0.098*	*0.195*	Not Significant
4. Kinesthetic Learning Style	*0.503*	*0.000*	Significant

The correlation is shown in table 5 that the relationship between scholastic performance and the extent of learning styles of the Grade 9 mathematics learners is significant in terms of visual learning style *(r=0.494, p=0.002)* and kinesthetic learning style *(r=0.503, p=0.000)*. This data is shown by their p-values which are less than *0.05* which led to the rejection of the null hypothesis that there is a relationship between the scholastic performance and the extent of learning styles of the Grade 9 mathematics learners in terms of visual learning style and kinesthetic learning style.

This data implies that learners often use visual and kinesthetic learning styles. These learning styles help the learners to enhance their educational performance. Through these strategies, learners may be able to

upgrade their learning by understanding the fundamental concepts of learning styles. Visual learning style improves learners' techniques in understanding the mathematics subject by using any visual ideas. Kinesthetic learning styles provide actual and hands-on performance to develop learners' achievement.

In the study of Ahmad et al. (2016), *160* UNITEN students were chosen as respondents using stratified random sampling techniques. Seventy-four students *(46.3%)* and eighty-six students *(53.8%)* participated in the study. The ethnic composition of the sample was *56* Malays *(35.0%)*, *52* Chinese *(32.5%)*, and *52* Indians *(32.5%)*. According to the findings, the most common learning styles among ESL students resulted in the following outcomes. Students preferred kinesthetic and visual learning styles, with only minor preferences for auditory, tactile, and group learning. Similarly, Orhun (2012) investigated whether academic success is affected by the learning style chosen. To determine the students' learning styles, he used David Kolb's learning styles inventory. The study discovered that the choice of learning styles had an effect on academic performance.

According to Abidin et al. (2011) as also mentioned in their study Abidin et al. (2020), when average and low achievers are taught according to their preferred learning styles, they achieve higher scores on standardized achievement tests. They investigated the relationship between visual and kinesthetic learning styles in high school female students and academic

performance. Their findings show a positive relationship between learners' learning styles and their academic grades. Similarly, a recent study of Akbari et al. (2013) found a significant relationship between these learning styles and academic performance of *488* Iranian high school students. The findings suggest that learning styles should be taken into account in order to maximize learners' performance.

The other factors were not significant such as auditory learning style *(r=0.239, p=0.089)* and tactile learning style *(r=0.098, p=0.195)*. Therefore, it did not reject the null hypothesis that implies no significant relationship between the scholastic performance and the extent of learning styles of the Grade 9 mathematics learners according to the auditory learning style and tactile learning style. This data means that learners had a high scholastic performance with their tasks, quizzes, activities, and homework when the auditory and tactile learning styles displayed high evidence. This data implies that the learners opted to use the auditory and tactile learning styles as the basis for developing their scholastic performance. Learners tend to learn better if these learning styles are achieved and acquired. Moreover, learners' interests in learning are visible in their learning styles. Auditory learning style and tactile learning style are essential to enhancing the learners' performance in school, to understand and remember the activities they have done.

According to Hariharan and Ismail (2003) cited in Ahmad (2016), high

school Malaysian students do not have distinct learning styles. The data suggest that respondents ranked kinesthetic, visual, and group learning as minor learning styles and tactile, auditory, and individual learning as negative learning styles.

Chapter V

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents the summary, findings, conclusions, and recommendations of the study.

Findings

This study determined the learners' self-concept and learning styles concerning the scholastic performance of Grade 9 mathematics learners in Modular Distance Learning Modality. The study was conducted in three *(3)* integrated schools of Polomolok *5* District; Klinan Integrated School, headed by Mr. Ronald T. Tudlasan, Viray-Lising Integrated School, headed by Mrs. Hermie F. Dumayas, and Polomolok- Creek Integrated School, headed by Mrs. Ruth L. Prudente. The self-concept and learning styles of Grade 9 mathematics learners enrolled this school year 2021-2022 were surveyed. The researcher of this study obtained the average scholastic performance of the learners during the second quarter and third quarter from their respective advisers.

The frequency distribution, mean, and percentage were used in the presentation and analysis of data in this study. Correlation and Pearson-r were used to determine the relationships among self-concept, learning styles, and learners' scholastic performance. The following are the findings of the study.

1. **The Self-concept of Grade 9 Mathematics Learners in Modular Distance Learning Modality**

    1.1. The learned self-concept of Grade 9 mathematics learners in modular distance learning modality has a total mean of *3.50* described as high.

    1.2. The organized self-concept of Grade 9 mathematics learners in modular distance learning modality has a total mean of *3.48* described as moderately high.

    1.3. The dynamic self-concept of Grade 9 mathematics learners in modular distance learning modality has a total mean of *3.70* described as high.

    1.4. The self-concept of the Grade 9 mathematics learners is described as high with an overall mean of *3.56*.

2. **The Learning Styles of Grade 9 Mathematics Learners in Modular Distance Learning Modality**

    2.1. The visual learning style of Grade 9 mathematics learners in modular distance learning modality has a total mean of *3.88* described as frequently.

    2.2. The auditory learning style of Grade 9 mathematics learners in modular distance learning modality has a total mean of *4.06* described as frequently.

    2.3. The tactile learning style of Grade 9 mathematics learners in modular distance learning modality has a total mean of *4.12*

described as frequently.

2.4. The kinesthetic learning style of Grade 9 mathematics learners in modular distance learning modality has a total mean of *3.85* described as frequently.

2.5. The learning styles of Grade 9 mathematics learners are described as frequently with an overall mean of *3.98*.

3. The Level of Scholastic Performance of the Grade 9 Mathematics Learners in Modular Distance Learning Modality

The level of scholastic performance of the Grade 9 mathematics learners showed that there are *57.22%* of learners who got *85-89* grade described as very satisfactory and *2.22%* who achieved a *75-79* grade described as fairly satisfactory. The over-all of their scholastic performance is *87.21%* described as very satisfactory.

4. The Relationship Between the Scholastic Performance and the Level of Self-concept of Grade 9 Mathematics Learners

4.1. Correlation tests showed that scholastic performance of Grade 9 mathematics learners in modular distance learning modality has a significant relationship in terms of learned self-concept *(r=0.647, p=0.000)*.

4.2. Correlation tests showed that scholastic performance of Grade 9 mathematics learners in modular distance learning modality has a significant relationship in terms of dynamic self-concept *(r=0.401, p=0.001)*.

4.3. Correlation tests showed that scholastic performance of Grade 9 mathematics learners in modular distance learning modality has no significant relationship in terms of organized self-concept *(r=0.136, p=0.073)*.

5. The Relationship Between the Scholastic Performance and the Level of Self-concept of Grade 9 Mathematics Learners in Modular Learning Distance Modality

5.1. Correlation tests showed that scholastic performance of Grade 9 mathematics learners have significant relationships in terms of visual learning style *(r=0.494, p=0.002).*

5.2. Correlation tests showed that scholastic performance of Grade 9 mathematics learners have significant relationships in terms of kinesthetic learning style *(r=0.503, p=0.000)*.

5.3. Correlation tests showed that scholastic performance of Grade 9 mathematics learners have no significant relationships in terms of auditory learning style *(r=0.239, p=0.089)*.

5.4. Correlation tests showed that scholastic performance of Grade 9 mathematics learners have no significant relationships in terms of tactile learning style *(r=0.098, p=0.195)*.

Conclusions

Based on the summary of findings, hereunder are the following conclusions:

1. The Grade 9 mathematics learners are high in learned and dynamic, self-concept, and moderately high in organized self-concept. This means that Grade 9 mathematics learners in Polomolok *5* District have a remarkable self-concept.
2. The Grade 9 mathematics learners in Polomolok *5* District are frequently using the visual, auditory, tactile, and kinesthetic learning styles. This means that Grade 9 mathematics learners display a highly evident learning style.
3. The Grade 9 mathematics learners' scholastic performance in Klinan Integrated School, Polo-Creek Integrated School, and Viray-Listing Integrated School was very satisfactory and displayed a high proficient performance in mathematics.
4. There is a significant relationship between the scholastic performances of Grade 9 mathematics learners in terms of learned self-concept and dynamic self-concept. There is no significant relationship between the scholastic performances of Grade 9 mathematics learners in terms of organized self-concept.
5. There is a significant relationship between the scholastic performance of Grade 9 mathematics learners' visual learning style and kinesthetic learning style. There is no significant relationship between the scholastic performance of Grade 9 mathematics learners' auditory learning style and tactile learning style.

6. The result also correlates to the self-concept theory wherein human characteristics and personal adjustment are essential components that emerge in relationships and strive for consistency. It also relates to the learning style theory in which learners can study their preferred learning styles that best suit their studies.

Recommendations

Based on the conclusions arrived in the study, the following were recommended:

1. The Department of Education may design programs such as personal and social abilities, and even social interactions to improve learners' self-concept. To gain additional insight that strengthens their ability and has a good background in the specific field, learners may encourage revisiting the curriculum. In acquiring several techniques in developing self-concept, the curriculum design may focus on how to make a remarkable self-concept. By this, the learners' self-concept may vary on the curriculum designed by DepEd.
2. Therefore, it is recommended that the schools engage in this study to provide learners' interests by participating and engaging in different activities. Schools may offer significant activities to develop and uplift the learning styles and enhance their styles. Meaningful and interactive activities like crossword puzzles and wall strips for visual

learners, hearing educational songs and rhymes for auditory learners, building models and role-playing for kinesthetic learners enhances their learning styles. Also, using differentiated instructions makes a learner a productive and competitive individual who develops their learning techniques and higher-order thinking skills.

3. The teacher may motivate the learners to mold and enhance their self-concept and learning styles to have good participation in the modular approach. Teachers may design Strategic Intervention Materials (SIM) for learners who are incapable and have a hard time answering modules, especially in mathematics.
4. Therefore, it is recommended that the learners focus on the learning styles to develop their performance in learning mathematics. Learners may motivate themselves to learn and participate in different activities. Learners should engage in self-paced training by following and redirecting to excellent academic performance. Learners may understand the importance of each learning style because it may help them develop their whole being by providing additional engaging and reflective activities to their personal experiences.
5. On the other hand, parents are the ones who motivate the learners to have access to any learning styles. Through the perseverance and eagerness of the learners, parents are capable of guiding their children. Parents developed, engaged, and actively encouraged their

children to participate in school activities. Through monitoring and guidance, learners are eager to learn. Parents may provide assistance and support to their children.

6. Future researchers may study the learning style preferences of junior high school learners in the study habits of mathematics subjects. Furthermore, future researchers may research the academic self-concept and the academic achievement of junior high school learners.

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Appendix A

Questionnaire on Self- Concept

Name (Optional): _____
School (Optional): _____

General Direction:

The following are statements that determine your self- concept. Put a check mark (/) to the corresponding box that describes your answer. Your response will be treated with utmost confidentiality. Please refer to the legend below for your numerical description.

I. GRADE 9 MATHEMATICS LEARNERS' SELF- CONCEPT IN MODULAR DISTANCE LEARNING MODALITY:

Legend:

Mean Range	Description
4.50-5.00	Very High
3.50-4.49	High
2.50-3.49	Moderately High
1.50-2.49	Low
1.00-1.49	Very Low

A. LEARNED SELF-CONCEPT	**5**	**4**	**3**	**2**	**1**
1. I learn the skills taught in Mathematics concept quickly.					
2. I understand Mathematics even it poses challenging problems.					
3. I am capable of making a good grade in Mathematics.					
4. I do extra work to learn Mathematics.					
5. I can answer every question in Mathematics.					
B. ORGANIZED SELF-CONCEPT					
1. I can handle difficulties in Mathematics subject.					
2. I am more enthusiastic in learning Mathematics.					
3. I excel in Mathematics compare to other subjects.					
4. I am good at Mathematics so I get good grades.					
5. I can pass the Mathematics subject easily and it is worth passing well.					

C. DYNAMIC SELF-CONCEPT					
1. I am delighted when answering Mathematics problems.					
2. I am comfortable in answering Mathematics problems.					
3. I have retention capacities in learning Mathematics.					
4. I can think fast in Mathematics problems.					
5. I engage in learning Mathematics for real-life situations.					

Appendix B

Questionnaire on Learning Styles

II. GRADE 9 MATHEMATICS LEARNERS' LEARNING STYLES IN MODULAR DISTANCE LEARNING MODALITY:

Legend:

Mean Range	Description
4.50-5.00	Always
3.50-4.49	Frequently
2.50-3.49	Often
1.50-2.49	Sometimes
1.00-1.49	Seldom

A. VISUAL LEARNING STYLE	**5**	**4**	**3**	**2**	**1**
1. I learn better by simply reading my modules in Mathematics.					
2. I remember what I have studied upon reading instructions in the Mathematics module.					
3. I understand Mathematics questions when reading directions.					
4. I understand Mathematics subject by watching Mathematics video tutorials than listening to my parents, guardian or relatives' lectures.					
5. I learn more by reading my Mathematics modules than by listening to my parents, guardian or relatives' lectures.					
B. AUDITORY LEARNING STYLE					
1. I understand Mathematics when my parents, guardian or relatives tells me the instructions.					
2. I can easily learn when my parents tell me how to do the activities in my Mathematics module.					
3. I remember things I have heard from my parents, guardian or relatives better than things I have read in the module.					
4. I excel in Mathematics when my parents, guardian or relatives explains the activity well in my module.					
5. I listen to the instructions of my parents, guardians.					
C. TACTILE LEARNING STYLE					
1. I learn more when my parents, guardian or relatives model something about what is stated in the Mathematics					

module.					
2. I am interested to learn in making activities in my Mathematics module.					
3. I can easily solve Mathematical problems in the module when writing or making drawings.					
4. I remember what I have learned when I do hands-on activities in the module.					
5. I enjoy learning when I explore activities in my Mathematics module.					
D. KINESTHETICS LEARNING STYLE					
1. I am interested in demonstrating activities found in the Mathematics module.					
2. I learn better when I do things at home.					
3. I enjoy learning at home by doing the additional activities provided in the Math module.					
4. I understand things better when I do it in actual performance with the help of my parents, guardian or relatives					
5. I can easily understand my lessons in the module by using manipulative materials found at home.					

Appendix C

Reliability and Validity Certification

This is to certify that the questionnaire on the **SELF-CONCEPT, LEARNING STYLES AND SCHOLASTIC PERFORMANCE OF GRADE 9 MATHEMATICS LEARNERS IN MODULAR DISTANCE LEARNING MODALITY** have passed the reliability test.

Interpretation:

The alpha coefficient for the three indicators, learned self-concept is *0.788* or *78.8%*, organized self-concept is *0.870* or *87.0%* and dynamic self-concept is *0.868* or *86.8%* and for over-all **SELF-CONCEPT** is ***.848* or *84.8%*** suggesting that the items have relatively excellent internal consistency and since the value of Cronbach's Alpha was above *0.7* or *70%* all items were deemed reliable.

The alpha coefficient for the four indicators such as visual learning styles *0.869* or *86.9%,* auditory learning styles *0.801* or *80.1%,* tactile learning styles *0.845* or *84.5%,* and kinesthetic learning styles *0.824* or *82.4%* and for overall **LEARNING STYLES** is ***0.864* or *86.4%*** suggesting that the items have relatively excellent internal consistency and since the value of Cronbach's Alpha was above *0.7* or *70%* all items were deemed reliable.

Mr. Hardy Bankas
Statistician

Appendix D

Chronbach Alpha Result

SELF-CONCEPT

- **LEARNED SELF-CONCEPT**

Reliability Statistics

Cronbach's Alpha	N of Items
0.788	5

- **ORGANIZED SELF-CONCEPT**

Reliability Statistics

Cronbach's Alpha	N of Items
0.870	5

- **DYNAMIC SELF-CONCEPT**

Reliability Statistics

Cronbach's Alpha	N of Items
0.868	5

OVER-ALL

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.848	0.879	15

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
L1	62.2500	38.303	0.523	.	0.838
L2	62.7000	38.432	0.379	.	0.845
L3	62.8000	38.800	0.410	.	0.843
L4	62.6500	37.713	0.371	.	0.847
L5	62.4000	36.989	0.651	.	0.831
O1	62.1500	37.503	0.851	.	0.828
O2	62.5000	38.053	0.402	.	0.844
O3	62.1500	37.503	0.851	.	0.828
O4	62.4000	38.568	0.396	.	0.844
O5	62.8000	37.537	0.377	.	0.847
D1	62.9500	38.261	0.316	.	0.851
D2	62.2500	37.882	0.688	.	0.832
D3	63.1000	36.621	0.451	.	0.842
D4	62.2500	36.618	0.752	.	0.827
D5	62.6500	37.082	0.430	.	0.843

LEARNING STYLES

- **VISUAL LEARNING STYLE**

Reliability Statistics

Cronbach's Alpha	N of Items
0.869	5

- **TACTILE LEARNING STYLE**

Reliability Statistics

Cronbach's Alpha	N of Items
0.845	5

- **AUDITORY LEARNING STYLE**

Reliability Statistics

Cronbach's Alpha	N of Items
0.801	5

- **KINESTHETIC LEARNING STYLE**

Reliability Statistics

Cronbach's Alpha	N of Items
0.824	5

OVER-ALL

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.864	0.880	20

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
V1	87.7500	50.197	0.148	.	0.869
V2	87.7500	51.882	-0.021	.	0.870
V3	87.7500	52.408	-0.102	.	0.872
V4	87.6000	50.463	0.318	.	0.863
V5	87.6500	49.292	0.490	.	0.859
A1	87.5500	50.471	0.449	.	0.862
A2	87.5500	50.471	0.449	.	0.862
A3	87.5500	50.471	0.449	.	0.862
A4	88.0000	43.789	0.683	.	0.848
A5	87.7000	46.958	0.658	.	0.853
T1	88.0000	46.105	0.509	.	0.856
T2	87.8500	44.976	0.725	.	0.848
T3	88.0500	43.945	0.669	.	0.849
T4	88.1500	44.134	0.560	.	0.854
T5	88.2500	45.566	0.417	.	0.862
K1	88.1500	43.924	0.626	.	0.850
K2	87.8500	44.976	0.725	.	0.848
K3	88.1000	44.726	0.546	.	0.854
K4	88.1000	45.042	0.517	.	0.856
K5	88.1500	44.555	0.523	.	0.856

Mr. Hardy Bankas
Statistician