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PUPILS' LEARNING STYLES AND ACADEMIC PERFORMANCE IN MODULAR LEARNING

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ABSTRACT

This study assesses the student learning styles and academic performance in modular learning among Grade IV, V, and VI learners of Hindang Central School. This considered the learning styles and academic performance of the respondents in modular learning. A total of 252 learners from Hindang Central School participated as respondents in the evaluative method of research that consists of two parts questionnaires. This study used a modified survey questionnaire from the University of California at Merced, Student Advising and Learning Center to gather the data of the respondents. As to the significance of learning styles and academic performances of the respondents in modular learning, Analysis of Variance (ANOVA) was used to analyze the significant differences. The study's findings indicated that auditory learning was the respondents' preferred method of learning. This learning style is best through speaking or listening. Moreover, auditory learners prevail dominantly amidst the health crisis faced. The respondents' academic achievement in the academic year 2020–2021 was also revealed to be Very Satisfactory. According to the Analysis of Variance (ANOVA), there was no apparent connection between learning preferences and academic achievement in the new typical education. Therefore, there was no relation or correlation between the two variables.

Keywords: *Learning Styles, Visual Learners, Auditory Learners, Tactile Learners, Academic Performance, Modular Learning*

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INTRODUCTION

Learning amidst the pandemic entails the careful implementation and constant monitoring because the learners depend solely on their pacing and understanding of the topics. Moreover, parents cannot be devout to attend to the needs of their children due to their occupations and other needs to attend in the family. The pupils can learn at their own pace, and it depends on their own learning pace considering the environmental factors in learning (Dayagbil FT, 2021). People's learning styles might vary surprisingly when it comes to their methods for gathering and analyzing information. According to research, each person processes information differently and with various preferences. These preferences are sometimes referred to as learning styles and are used to define and comprehend the various learning styles that exist among individuals (Chick, 2022).

Additionally, he argues that while some students may be particularly responsive to visual information like pictures and diagrams, others may prefer written and verbal explanations. While some people learn better through active participation and interaction, others function best on their own.

Typically, the concept of learning styles refers to a preferred method of learning. It suggests that everyone has a tendency towards the learning of some kind and that if that preference can be identified,



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teaching and learning experiences can be offered to help a person learn more effectively. The goal of learning styles theory is to better understand how people learn rather than to categorize or define them (Team, 2022).

A child's learning style is how he prefers to assimilate new information for effective learning (Ilcin, 2018). Acquiring style, according to Rita Dunn (1993) as cited by Ilcin (2018) is "a unique way developed by students when he/she was learning new and difficult knowledge." Hence, he posits that it is more important to consider how pupils learn than what they learn. Even in the same educational environment, learning does not take place at the same degree of quality for all students since each learner's learning process is distinct. According to studies, people have different ways of learning, thus no particular strategy or approach was able to produce the best learning conditions for everyone. This could be due to differences in students' origins, abilities, weaknesses, interests, objectives, motivation levels, and study methods.

According to Için and colleagues, this may be related to students' various backgrounds, strengths, weaknesses, interests, objectives, levels of motivation, and study methods (2018). Additionally, understanding learning styles may be beneficial for teaching and learning improvements for both students and teachers.

Finding out students' learning preferences reveals information about their particular preferences. It can be simpler to develop, alter, and implement curriculum and educational programs that are more effective when learning styles are understood. In addition, it might compel students to participate in these initiatives and inspire them to acquire professional expertise. Therefore, identifying one's preferred learning style is essential for enhancing learning effectiveness.

The learning styles of learners are one of the problems faced in the implementation of modular distance learning due to the following reasons: lack of supervision from the teacher, and complexity of the learning materials used. There are three basic types of learning: kinesthetic or tactile, auditory, and visual. Visual learners gain knowledge by watching and reading. The most effective technique is to use textbooks, images, diagrams, or live demonstrations that people can see. Through speaking and listening, auditory learners excel. Learners will do well in a lecture hall atmosphere by listening to tapes or music. The greatest way for kinesthetic or tactile learners to learn is by doing and touching. For this type of learner, school scenario activities work well, and a tactile learner tends to do well with manual dexterity tasks (Için et al., 2018).

The result of this study will give the greatest impact on the pupils to come up with effective learning in their academic status in school. This may also help the teachers so they can use teaching strategies to suit each pupil in the learning process. Parents will also provide additional assistance to the students for them to achieve great academic success. The school will help in revisiting its teaching and learning strategies and enhancing its academic policies.

Research Questions

1. What are the learning styles of the respondents?
2. What is the respondents' academic standing in modular learning?
3. Does the academic achievement of students who participate in modular learning differ significantly from their learning preferences?
4. Which course of action can be suggested in accordance with the study's findings?



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REVIEW OF RELATED LITERATURE

This chapter presents the results of studies that are already published that support the study. This also includes similar studies of the said research which are significant and thus provide directions for the study. The learning process is significantly influenced by learning styles. Aboe (2019) states that every student has different styles to learn. They have their way of studying something which makes them comfortable to be able to absorb and understand the material easily. Furthermore, he emphasizes that some students prefer to read a book and memorize the material, while others require the assistance of notes to comprehend the subject. Other students prefer viewing a video tutorial to learn how to do something rather than reading a manual book. Learners select the method that is most comfortable for them to learn and comprehend the subject. Thus, there are considerable relationships between learning style and student accomplishment (Yufrizal et al., 2015). Students' preferred learning methods may influence how well they achieve academically. Teachers can incorporate teaching patterns and tactics by considering students' preferred learning styles.

The preferences of students' learning styles are crucial to understanding and improving their level of comprehension, as well as understanding how they learn. Without identifying and comprehending students' preferred learning styles, teachers are unlikely to employ effective teaching techniques that correspond to the various learning preferences of the students. The alignment between students' learning styles and teachers' teaching styles lead to better comprehension and understanding of complex lessons. The teaching-learning process can benefit greatly from both students' and teachers' awareness of different learning styles (Yasmin, Akbar, & Hussain, 2016).

There are studies that support that learning styles significantly affect the academic performance of learners. According to Ramirez (2022), learning styles significantly affect academic performance. This suggests that learning style and academic success are substantially correlated. This implies that pupils' learning preferences and academic success are related. Knowing this, educators may design classes and activities that best fit the learning preferences of their students. In doing so, they said their students in enhancing their abilities and improving their academic achievement. According to Yazici (2016), learning style choices have an impact on learning and academic success. Thus, Magulod Jr. (2019) reveals that students in applied science courses preferred visual, group, and kinesthetic learning modes as major preferences, while they regarded tactile, auditory, and individual learning modes as minor preferences. This information is based on an analysis of the academic achievement levels, preferred learning styles, and study habits of students taking applied science courses. Furthermore, he states that there are strong correlations between students' academic success in applied science courses and their learning preferences, study techniques, and routines.

In as much as there are studies that show that learning style preferences are significant in academic success there are also those who claim the opposite. From the reviewed literature of Almigbal (2015), he contends that there is a substantial gender difference in learning style preferences. Additionally, there was a statistically significant link between students' preferences for different learning styles and the instructional curriculum they were enrolled in. Further, he posits that learning style preferences are unrelated to a student's academic achievements, marital status, domicile, or study resources and learning style preferences were also unrelated to General Percentage Average (GPA) after other study characteristics were considered. As a result, learning styles affect how pupils learn and are also influenced by a person's personal experiences, culture, maturity, and development, according to Hong JC and colleagues (2016). Every learner has a unique and favored way of organizing, perceiving, and learning. Additionally, participants' pleasure with the teaching strategy is unaffected by their learning styles.

Moreover, Liew, et. Al (2015) asserts that learning preferences do not have a major impact on the outcomes of learning. Future research is helpful to medical teachers in assisting students to become



more adept learners by re-evaluating the sustainability of these learning preferences (styles and approaches) following the incorporation of teaching-learning instructions tailored individually to the students. This was supported by Sankey et al. (2011) in their research which assesses the influence of various representations on various learning outcomes, such as engagement and performance of students. According to their findings, multiple representations of the same piece of information did not significantly enhance learning outcomes. With this, Rahmadani (2021) presents the findings of his study that when looking at mean scores, learning style had no discernible impact on students' listening performance. It means that there is no discernible difference between students' listening performance when it comes to their visual, auditory, or kinesthetic learning styles.

For students to easily understand what is being taught, learning styles are a crucial component of how the teacher exhibits the students' knowledge (Busilaoco et al., 2014). In a study conducted by Rezaeinejad (2015) on the Learning Styles and Its Relationship with Educational Achievement among Iranian High School Students, he found that knowing the student's learning styles will help the teacher deliver the lesson that students can cope with easily, make diverse teaching strategies, and lead to their educational achievement. Maya and colleagues (2021) want to compare learning styles based on personal and educational characteristics, analyze the relationship between learning styles and academic achievement and consistency in four assessment techniques, and investigate the impact of learning dimensions. The study's findings support the adoption of teaching-learning methods that are based on the identification of learning styles.

Teachers' knowledge of the learners' learning styles and preferences is important. According to Shabani (2012), teachers are unable to give effective teaching strategies to meet the various learning style preferences of the students if they lack sufficient knowledge about their preferences. However, given the variety of learning styles present in a particular student group, the most successful teaching methods that teachers might employ tend to vary depending on these styles. However, Kharb, et.al (2013) mention that not all pupils or even most students respond well to a single teaching strategy. All students may benefit from a productive learning environment if educators consider the diverse learning preferences of the students and work to match teaching and learning methods. Thus Gilakjani (2012) asserts that the identification of each student's learning style, the matching of the teaching style to the learning style for challenging tasks, the strengthening of weaker learning styles through simpler tasks and drills, and the teaching of learning-style selection techniques are all ways that teachers can incorporate learning styles into their classrooms. Multiple learning opportunities and "learning style-shifting" are crucial for students, and teachers should successfully tailor their instructional tactics to each student's individual learning preferences. Teaching different learning styles helps students learn more effectively overall, enhances motivation and productivity, and fosters a good attitude toward the language being taught. Finding the most effective teaching and learning methods for both students and teachers is the goal of using learning styles. Furthermore, when the learning styles of the students and teaching strategies complement, it may result in high academic performance. The researcher also added that students' learning styles remained the same for all subjects. As a result, teachers should consider the learning styles of their students from the start of the school year to improve the learning environment and students' academic performance by using the right teaching techniques.

In the learning styles and academic performance of learners in modular learning, Carlton (2021) states that learning styles during pre-pandemic and pandemic periods have no differences at all. Hence, visual learners tend to learn through diagrams, designs, or even doodles and taking some notes for retention as same as the pre-pandemic perspectives. Furthermore, auditory learners can excel due to the recent situation as distance learning specifically online classes tend to place a greater emphasis on sound and listening. Moreover, hybrid and virtual learning environments are particularly helpful for kinesthetic learners. In addition, learners tend to learn more through engaging or movements.



Numerous elements contribute to the learning process because the pandemic adopted a modular approach to learning. First, their inability to lead and explain the modules that were offered to their kids (Guiamalon, 2021). Second, parents complain that the time allotted for doing learning activities was insufficient because there were so many of them (Olivo, 2021). Third, some parents asserted that they were unable to comprehend certain concepts in the module and were unable to assist their kids in completing the learning tasks (Olivo, 2021). The delivery, modality, curriculum content and standards, educational tools and resources, parents' ability to provide support, and students' preparedness to read and study independently all had a significant impact on the quality of education (Panganiban et al., 2021).

The results of their English test, as reported by Bihis and Velasco (2021) in their paper Learning Styles in Modular Distance Learning and the English Achievement of Grade V Pupils, fall under demonstrates that regardless of the respondents' preferred learning technique (visual, aural, or kinesthetic), they are still skilled in English in terms of vocabulary, reading comprehension, and grammar. Reading comprehension, vocabulary, and grammatical proficiency in English were significantly correlated with the visual learning approach.

However, in terms of auditory/aural learning style, only vocabulary was found to be significantly related. Despite this finding, educators should be aware of their student's preferred learning styles so they can offer activities, topics, or discussions that best suit the learners' needs. They should also be inventive and resourceful when creating learning materials to be distributed to students. Be informed of their preferred learning method to aid in their academic progress, as this will allow future researchers to undertake comparable or more involved studies.

RESEARCH METHODOLOGY

Research Design

This was a quantitative research design wherein empirical evidence was made after the raw data was analyzed statistically. Suitable statistical tools were employed to interpret the study's findings when the necessary data were gathered. This study used descriptive correlation methods. Descriptive statistics were employed, including mean, frequency, and percentage. To investigate the connection between learning styles and academic achievement, analysis of variance (ANOVA) was utilized.

Research Respondents

The study was conducted in Hindang Central School, Hindang District, Division of Leyte. It is located at Poblacion I, Hindang, Leyte, in the southern part of Población. It is near the highway and is accessible by any transportation. Based on the Learner Information System (LIS) in 2020, it had an average enrolment of 743 learners with 26 teachers from Kindergarten to Grade VI. It is supervised by a school principal. The learners were mostly the residents of Poblacion I, Poblacion II, and its surrounding barangays. The livelihood of parents were government employees, businessmen farmers, fisherfolks, laborers, and housewives.

The grade four to six learners of the school with a total population of 319 learners served as respondents. A total of 252 respondents were chosen based on the Qualtrics online sample size calculator. Out of the sample size determined, the researcher utilized a fishbowl draw method. This method was a type of simple random sampling where the researcher assigned numbers to each respondent and put them into a fishbowl or container and shuffled them. Each slip of paper was randomly picked out one by one. Learners from lower grades (Kindergarten-Grade 3) were not considered in the study since the tool used is not appropriate for them.



The table below shows the school's population and the sample size determined.

Table 1. Distribution of Respondents

Grade	Population	Sample Size
Grade Four	111	87
Grade Five	95	77
Grade Six	113	88
Total	319	252

Research Instrument

The researcher used a simplified online learning style questionnaire to fit the attention span and capability of the respondents. The survey questionnaire was adopted from "Learning Style Questionnaire University of Texas Learning Center, 2006 (Free access). The researcher chose this tool because of its simplicity, and it was enriched because it came up from two sets of learning-style questionnaires.

The questionnaire had two parts. The learning styles survey was Part 1. The survey determined which of the different types of learning the learner fits. There were three learning styles: auditory, kinesthetic, and visual learning styles. The tool was composed of twenty-four statements equally distributed to three learning style preferences.

Questions 2, 3, 7, 10, 14, 16, 19, and 22 were for visual learners. On the other hand, questions 1, 5, 8, 11, 13, 18, 21, and 24 were for auditory, and questions 4, 6, 9, 12, 15, 17, 20, and 23 were for tactile or kinesthetic. The research tool was found in the appendices for easy reference.

The respondents' academic performance was covered in Part II. The GPA of the respondents during the SY 2020-2021 was the data collected on the full modular learning modality. A proper process was followed in acquiring from the adviser after written approval from the school administrators. To maintain the confidentiality of this delicate data, the anonymity of the respondents was upheld, and data was handled strictly.

Data Analysis

The Dean of the graduate school approved the collection of data by sending a letter, and then letters requesting permission from the school principal were sent after that. Since this study involved minor respondents, written consent from their parents or guardians was furnished before the respondents participated in the study.

The respondents were informed of the study's objectives, asked for their consent, and instructed to answer the questionnaire truthfully to produce reliable results. The researcher adhered to the local IATF guidelines for COVID-19 health protocols. The use of a face mask, hand washing, and temperature monitoring were noted.

After gathering all the necessary information, the study's results were analyzed using the proper statistical methods. Initially, the respondents' score on Part 1 of the Learning Style Questionnaire was calculated and analyzed. The learners were divided into groups based on the respondents' scores and their dominant learning preferences, such as visual, auditory, kinesthetic, or tactile. Descriptive statistics including mean, standard deviation, frequency counts, and percentages were used to describe respondents' academic performance across all topics, perceptions of the students, and prevalent learning styles.

Learning styles were measured using 5, 3, 1 where respondents check their preference where 5 means "always", 3 is "sometimes" and 1 is "seldom". The rating was added then the highest score was the



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preferred learning style of the respondents. In data gathering, the researcher summed up the scores from the respondents, the highest score was the preferred learning style of the respondents. It could be visual, auditory, kinesthetic, visual-auditory, visual-kinesthetic, auditory-kinesthetic, or visual-auditory-kinesthetic kind of learners. After knowing their preferred learning styles, the researcher determined the average mean per learning style namely: visual, auditory, and kinesthetic.

As to the academic performance of the respondents in modular learning, the Grades of the respondents for the 1st to 4th quarters were taken from DepEd Form 138-E.

An integral component of curriculum implementation was classroom assessment. It allowed the teachers to track and assess learners' academic performance and make necessary instructional adjustments accordingly. The progress report card followed the description and grading scale based on DepEd Form 138-E. 90-100 was outstanding, 85-89 was very satisfactory, 80-84 was satisfactory and 75-79 was fairly satisfactory. If the grade was below 75, it means the student did not meet the syllabus expectations. For the significant difference between the academic performance among the different learning styles of the students in the new learning, Analysis of Variance (ANOVA) was utilized.

RESEARCH FINDINGS AND DISCUSSION

Learning Styles of the Respondents

These learning styles are visual, auditory, tactile, or kinesthetic learning styles. Each learning style has 8 indicators as indicated in the given questionnaire found in Appendix F. Through this, the researcher determines the average mean of each learning style and then ranks them.

The learning styles of the respondents are reflected in Tables 2, 2.1, 2.2, and 2.3. It is shown in the table that the highest mean score of the learning styles is "tactile" (4.31) followed by the auditory learning styles with a mean score of 4.25 and the visual learning styles have the lowest mean score of 3.54.

Table 2. Summary Table on the Respondents' Learning Style

Learning Style	Mean	Rank
Tactile	4.31	1
Auditory	4.25	2
Visual	3.54	3

Table 2 provides an overview of the respondents' learning preferences. It displays the means and ranks. Overall, the tactile learning style (mean score: 4.31) ranked first on the list followed by auditory (mean score: 4.25) and visual learning styles (mean score: 3.54). The study's conclusions show that touch or movement are the primary learning modalities for most respondents. This supports the study of Tyas and colleagues (2013) and Carlton (2021) that learners learn best by doing or engaging in hands-on activities. During the pandemic, a disruption in learning showed to be affected as this study revealed that most of the respondents were tactile learners. This implies that tactile learners were the dominant learning style in the modular learning (Tyas et al, 2013; Carlton, 2021).

Tactile or Kinesthetic Learners

Kinesthetic or tactile learners acquire knowledge through hands-on experiences and comprehend without the aid of reading or listening. In this study, there are eight indicators to identify tactile or kinesthetic learners. The study's findings are displayed in the table below.



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The distribution of respondents rating for each indicator is presented in Appendix I.

Table 2.1 Mean preference score of respondents on Tactile/Kinesthetic Learning Styles(n-21)

Learning Style Indicator	Mean
Indicator 4 – I prefer to use posters, models, or actual practice and other activities in class.	4.71
Indicator 6 - I like making things or working with my hands.	4.71
Indicator 9 - I recall things better when I write them down multiple times.	4.71
Indicator 12 - In my pocket, I fiddle with coins or keys.	4.33
Indicator 15 - While studying, I smoke, chew gum, or eat.	3.95
Indicator 17 - I use "finger spelling" to learn how to spell words.	4.33
Indicator 20 - During lessons, I hold things in my hands.	4.00
Indicator 23 - I'm really at ease touching and hugging people.	3.71
Weighted Mean	4.31

The kinesthetic learning style obtained a mean score of 4.31. Indicators 4, 6, and 9 are categorized to be the dominant indicators among the respondents. Based on the data in Appendix J, most of the respondents give the highest score to the said indicators. This suggests that the respondents preferred to use posters, models, or actual practice and other activities in the class. Following these activities, the respondents enjoyed using their hands to create things, and they found that they remembered information best by writing down notes or things multiple times. According to Tyas et al. (2013), their study stated that when kinesthetic students experiment and participate physically in-class activities, the students learned more effectively. When children actively participate in events, field excursions, and role plays, the learners retain information effectively.

With tactile learners, the kinesthetic type differs slightly since they acquire knowledge through "hands-on" experience. They enjoy conducting experiments in a lab, making models by hand, handling, and manipulating materials. They actively participate in class and take notes or instructions to help them recall material.

Contrastingly, indicators 23, 15, and 20 are categorized as the "lowest" mean score as reflected in the above table. Indicator 23 has a mean score of 3.71. This means that the learners seldom use this indicator because learners are hesitant of touching someone. This conveys that the respondents occasionally feel comfortable by touching and hugging others. The average score for indicator 15 (While studying, I smoke, chew gum, or eat) is 3.95. This implies that respondents intermittently chew gum or eat snacks when studying. Indicator 20 has a mean score of 4.00. This indicates that students grip objects on their hands during learning periods. Alfira (2016) states that the students who exhibit these traits are known as tactile learners: (a) they write very firmly with a pen or pencil; (b) they enjoy using tools; (c) In my pocket, I fiddle with coins or keys; (d) While studying, they smoke, chew gum, or eat; (e) they use "finger spelling" to learn how to spell words; (f) they are skilled at completing mazes and jigsaw puzzles; (g) during lessons, they hold things in their hands.

The 4.71 is attributed to the results of 21 respondents who are distinguished to be tactile learners. In this research, there are some respondents who are always tactile (5) and sometimes tactile (3). The always tactile respondents are interpreted as the learners who strongly prefer to use posters, models, or actual practice, enjoy working with hands or making things and remember best by writing things down several times. While for sometimes students, although the students are tactile but their ability to prefer to use posters, models, enjoy working with hands and by writing things down for several times different with always tactile students. To conclude, sometimes tactile learners have lower ability to the said indicators than the always tactile learners.



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Auditory Learners

Auditory learners learn through listening because the learner depends on their hearing and speaking skills. In this research, there are eight indicators used to identify auditory learners. Indicators 1, 5, 8, 11, 13, 18, 21, and 24 are identified to be auditory learning styles. Table 2.2 presents the distinct standards of auditory learning style and the weighted mean rating on the auditory learning style is 4.25. The distribution of respondents rating for each indicator is presented in Appendix H.

Table 2.2 Respondents' average preference score for auditory learning styles (n-101)

Learning Style Indicator	Mean
Indicator 1 – My favorite memory comes from attending lectures that include information, justifications, and conversations.	4.39
Indicator 5 - I need explanations for any graphs, diagrams, or other visual cues.	4.60
Indicator 8 - When presented with pairings of sounds, I can determine if they match.	4.17
Indicator 11 - I learn most effectively via lectures and instructional CDs.	4.45
Indicator 13 - Speaking the words aloud helps me spell words more accurately than writing them down.	4.39
Indicator 18 - Instead of reading about the same subject, I would prefer to listen to a good lecture or speech.	4.37
Indicator 21 - I like to read the news online or on the radio.	3.84
Indicator 24 - I am better at following spoken directions than written ones.	3.79
Weighted Mean	4.25

Auditory learning style emerged to be the second preferred learning style of the students with a mean score of 4.25. The top four indicators under the auditory learning styles were 5 which states "I require explanations of diagrams, graphs or visual directions", 11 which states "I do best in academic subjects by listening to lectures and cassettes," 1 (I can retain information, explanations, and conversations best when listening to a lecture), and 13 (I learn to spell better by repeating things out loud than by writing the words on paper)". Many respondents under this learning style preferred explanations of diagrams, graphs, or visual directions followed by listening to lectures and tapes that include information, explanations, and discussions, and respondents learn to spell by repeating words out loud than by writing the words on a paper.

However, the least-scored indicators among the respondents were 8 (which means "I can tell if sounds match when presented with pairs of sounds," 21 (which means "I prefer listening to the news on the radio or online," and 24 (means "I follow oral directions better than written ones"). This indicates that when presented with pairings of sounds, the respondents can determine whether they match. They also chose to follow oral instructions over written ones and listen to the news on the radio or online. According to this study, pupils are strongly capable of understanding the material if it is delivered in audio form because they are always auditory learners. Even though learners who are occasionally auditory are assumed to be auditory learners, they lack a good understanding of the subject if it is provided in audio form. In conclusion, always auditory learners are better at understanding material than occasionally auditory learners (Alfira,2016).

The results show that kids learn more effectively while they are listening. In a 2017 study, Kayalar & Kayalar found that verbal communication is the most effective form of instruction for auditory learners.



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Due to their ability to learn information through auditory representation, they are good at remembering what they hear.

Visual Learners

Visual learners prefer either visuals, diagrams, drawings, or text. The quickest-to-understand lectures or text-based presentations are the ones that help students learn the most. Based on the instrument's preference score, the learners' learning preferences were ascertained. The learning style would be more pronounced based on the higher preference score. The table shows the different indicators of visual learning styles, and the weighted mean rating on the visual learning styles is 3.54. The distribution of respondents rating for each indicator is presented in Appendix G.

Table 2.3 Average preference score of responders (n=87) on the visual learning styles

Learning Style Indicator	Mean
Indicator 2 – I prefer knowledge to be presented on the board, supported by visual aids and accompanied by prescribed readings.	4.01
Indicator 3 - I enjoy taking notes or writing things down for later visual inspection.	4.13
Indicator 7 - I am proficient in and enjoy creating graphs and charts.	3.16
Indicator 10 - I can read and follow directions on a map with ease.	3.07
Indicator 14 - Reading about something helps me better comprehend a news piece.	3.44
Indicator 16 - I believe that visualizing something in my mind is the greatest method to remember it.	3.41
Indicator 19 - I am skilled in working and clearing mazes and jigsaw puzzles.	3.64
Indicator 22 - I prefer reading about an interesting topic to learn more about it.	3.46
Weighted Mean	3.54

Based on Table 2.3 presented, the top three indicators under the visual learning styles were indicators 3, 2, and 19. The usual visual learners of indicators two and three have higher scores than the occasional visual learners of indicators 19. In addition to viewing information written on the board and supplemented by visual aids and assigned readings, many respondents preferred to jot things down or take notes for visual review. The respondents were also skilled at working and solving jigsaw puzzles and mazes.

The result suggests that the respondents used the information extensively and that this was reflected in their survey responses. The pupils have the traits of visual learners, and they readily comprehend the material that was delivered in a visual format. However, children who don't use visuals often are assumed to not fully comprehend the information presented visually, even though they are visual learners. As a result, visual learners are more adept at understanding the content of learners who use it very occasionally (Alfira,2016).

On the other hand, indicators 16, 7, and 10 are categorized as “lowest” as reflected by the mean scores. Indicator 16 has a mean score of 3.41. This means that respondents sometimes picture something in their minds. The mean score for indicator 7—“I am skilled at and love generating graphs and charts”—is 3.16. This indicates that people occasionally favor creating graphs and charts. Indicator 10 has a mean score of 3.07. This means that the respondents least preferred understanding and following directions on the map.



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This implies that the pupils remember and understand concepts better with pictures. A better understanding is manifested with the aid of flashcards, PowerPoint slides, and books. Felder & Solomon (2017) explained that visual learners remember best what they see in pictures, diagrams, and films. They frequently find visual representations of course information that was mostly spoken, such as diagrams, sketches, and photographs, to be highly helpful in learning.

While not all pupils are visual and auditory learners, some learned better when they are physically involved/engaged in the learning activity. According to Goodman Lorry (2017), kinesthetic learning style is the way in which students act and employ stimuli during the learning process. With students often having a solid motor memory and the capacity to react rapidly, this is frequently best suited to circumstances like role plays, field excursions, hands-on projects, and contests.

The above findings show that learners are different. This suggests that teachers should adopt distinct teaching styles for multiple intelligence. According to Silver et al. (1997), their conclusions back up the hypothesis of different intelligences and learning styles. It might lessen each person's weaknesses and accentuate their strengths while giving teachers some useful advice on how to successfully implement learning styles and the multiple intelligences theory in the classroom.

Conforming to Aristotle, "Each child possessed unique talents and skills." Since auditory learners learn best when they can hear the subject they are learning, teachers must provide resources that are appropriate for their needs. The teacher's teaching strategies and approaches must be compatible with the student's learning styles. At the beginning of each class, a learning style diagnosis must be given. Changes to the curriculum should concentrate exclusively on the most important learning competencies while retaining the greatest level of material delivery because the epidemic is still there.

Academic Performance of the Respondents

Academic performance reflects a student's knowledge, skill level, and areas of strength and weakness. It might serve as a useful indicator of how successful they are in their academic setting (Cavilla, 2017).

In this study, Academic performance refers to the grades taken from DepEd Form 138-E for the 1st to 4th quarters of the school year 2020-2021. The academic performance was qualitatively described based on the DepEd Form 138-E or School Form 9, namely: outstanding (GPA 90-100), very satisfactory (GPA 85-89), satisfactory (GPA 80-84), and fairly satisfactory (GPA 75-79). The distribution of respondents rating for each indicator is presented in Appendix J.

Table 3. Distribution of Academic performance of the respondents by category

Category	Number of Respondents	%
Outstanding	63	25
Very Satisfactory	147	58
Satisfactory	42	17
Fairly Satisfactory	0	0
Overall	252	100

Table 3 shows the distribution of the academic performance of the respondents by category. 58 percent of responses fall into the "very satisfactory" category. Next, 25% was "outstanding", and 17% was "satisfactory".



In this study, respondents perform very satisfactorily in their academic performance which has a rating of 85-89%. Learners during the pandemic are performing well as indicated in a very satisfactory rating in their report card. In relation to learning styles, these contributed to their academic performance and to how the learners process the information prescribed by the curriculum. The findings of the study correlate with the study of Busilaoco and colleagues (2014) and Rezaeinejad (2015) about learning styles and academic performance.

For students to easily understand what is being taught, learning styles are a crucial component of how the teacher assesses the student's knowledge (Busilaoco et al., 2014). Furthermore, Rezaeinejad (2015) discovered that identifying the students' learning styles will enable the teacher to present a lesson that students can cope with easily, make varied teaching-learning strategies, and lead to their academic performance.

Based on the findings of this study, out of 252 respondents, a considerable 58 % of learners belong to the very satisfactory category. Despite the disruption in learning during the pandemic, learners were positive in terms of academic performance. However, the findings of Garcia and Weiss (2020) and Kuhfeld et al. (2020) opposed the study findings.

It is crucial to employ a thorough model of learning style that identifies each person's strengths and preferences throughout the complete range of physiological, sociological, psychological, emotional, and environmental factors to disclose these innate tendencies and styles (Kolb & Kolb, 2017).

In terms of academic performance, the respondents acquired a cumulative GPA ranging from 85-89% and this is categorized as "Very Satisfactory". Moreover, many factors are to be considered in determining school performance based on learning styles such as teaching strategies (Yasmin et al., 2016). In the study, there were 101 (40%) auditory learners with a mean GPA of 87.45 (SD 3.061); 87 (35%) were visual learners with a mean GPA of 86.94 (SD 2.553) and 21 (8%) were kinesthetic/tactile learners with a mean of 87.95 (SD 3.612).

Significant variations between pupils' academic performance and learning styles in the new normal

In the new learning environment, Table 4 displays the mean and standard deviation of academic achievement by learning style. Table 4 displays the mean and standard deviation for each study area and the correlation between respondents' learning preferences and academic performance.

The GPA of visual, auditory, kinesthetic, visual-auditory, visual-kinesthetic, and auditory-kinesthetic learning styles have the "Very Satisfactory" results. The visual-auditory-kinesthetic learning style has an "Outstanding" result. In general, the respondents have a mean GPA of 87.24 (± 2.99250) with a "Very Satisfactory" result.

Since the modular way of learning was used during the pandemic, many factors were contributing to the learning process. First, the incapability of facilitating and explaining the modules provided for their children (Guiamalon, 2021). Second, parents complained that the time allotted for doing learning activities was insufficient because there were so many activities (Olivo, 2021). Third, several parents asserted that they found some themes in the module difficult to understand and that this made it impossible for them to assist their kids with the learning exercises (Olivo, 2021). Lastly, quality education was greatly affected by the delivery of modality, the curriculum content and standards, educational equipment and resources, the competence of parents to give assistance, and the readiness of the learners to read and learn independently (Panganiban et al., 2021).



In relation to the study, learners utilized modular learning because this is the most feasible method of learning in this type of learning environment. With this, the factors mentioned above are relevant and connected to the study.

Table 4. Depending on the respondents' preferred learning modes, the respondents' academic performance

Learning Style	n	Academic Performance		Description
		Mean	SD	
Visual	87	86.94	2.553	Very Satisfactory
Auditory	101	87.45	3.061	Very Satisfactory
Kinesthetic	21	87.95	3.612	Very Satisfactory
Visual-Auditory	32	87.06	3.491	Very Satisfactory
Visual-Kinesthetic	2	86.50	2.121	Very Satisfactory
Auditory-Kinesthetic	8	86.50	3.162	Very Satisfactory
Visual-Auditory-Kinesthetic	1	90.00	.	Outstanding
Total	252	87.24	2.993	Very Satisfactory

All these learning styles were doing good based on their academic performance. With the implementation of modular learning, teachers are hesitant to give high grades to the learners because the learning environment took place at home and teachers cannot assure on how the learners learn (Dangle and Sumaoang, 2020). Moreover, the student's answers in their modules have no validity, and most probably, mastery of the lessons is impossible to attain. Some parents lack the knowledge to assist their child/children.

On the other hand, Analysis of Variance (ANOVA) was used to examine the statistically significant relationship in academic performance among the students' various learning preferences when learning in the new normal. The impact of various learning modalities on students' academic performance was investigated using ANOVA. This statistical method was also used to compare the academic performance among several learning styles.

Table 5. Analysis of Variance (ANOVA) table for the differences in academic performance among different learning styles

Sources of Variation	Sum of Squares	df	Mean Square	F	p-value	Significance
Between Groups	36.724	6	6.121	.678	.667	Not Significant
Within Groups	2210.991	245	9.024			
Total	2247.714	251				

Table 5 presents the analysis of learning styles and academic performance of the learners in modular learning. The association between the learners' learning styles and academic achievement was examined using analysis of variance (ANOVA).

With the computed p-value of 0.667 which is greater than 0.05 (5% level of significance), the learners' learning styles and academic performance have no significant relationship. There are several explanations or attribution factors for why there is no statistically significant correlation between these variables. The first is the epidemic condition, in which students tend to form groups based on their



preferences. Second, the learners' modular approach to learning paved the way for such groupings; and third, the present study did not uncover any learning styles that varied from learner to learner.

The relationship between respondents' academic success and learning preferences in the new normal is shown in the table. The sum of squares, df, mean square, F, and p-value for the sources of variation for the between-groups category are 36.724, 6.121, 6.121, and 6.678, respectively. The total squares for the within-groups category are 2210.991, the df is 245 and the mean square is 9.024.

It demonstrates that there are no significant variations between respondents' various learning preferences and their academic performance. The findings conflict with those of investigations by Yufrizal et al. (2015), Akrolu (2014), Almigbal (2015), and Ramirez (2022). They contend that various pupils have various pedagogies and learning preferences. Student accomplishment and learning style have a lot in common. Depending on the environment and how the teacher and students interact, pupils' preferred learning styles may change. By considering the preferred learning styles of their students, teachers might incorporate teaching methods and ideas.

It can be suggested to provide extra activities in every learning style based on the study's findings. Through these, learners with their preferred learning styles can easily understand the material and get better academic performance. In addition, through these activities found in Appendix L, learners enhance their learning styles.

CONCLUSION

Based on the student's academic achievement and learning preferences, the study assesses the learners' involvement in modular learning. The results show that there are no significant variations between the respondents' academic performance and learning methods. There is no correlation between learning preferences and academic performance. It means that the teacher-learner interaction gives a great impact on the academic performance of the respondents not their preferences for learning. The low mean score manifests their adjustment to the transition of the learning modality. It can be further concluded that despite what learning style preferred these do not curtail their willingness to learn and be given the chance to excel in accordance with the teaching strategies made by the teacher.

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