

Effects of Teaching Strategies in the Academic Performance of Senior High School Student

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Abstract: *This study was conducted to analyze the influence of learning styles and teaching strategies on academic performance in mathematics. Surveys were conducted to 183 randomly selected Senior high school students and 3 purposively sample mathematics teachers. Findings reveal that most of the student-respondents have a combination of dependent, collaborative, and independent learning styles. Multiple regression analysis indicates that among the learning styles, independent style has the highest significant influence on the academic performance of Senior high school students. By understanding the learning styles of students, teachers will be guided in designing different strategies to help students enhance learning for their improved performance in mathematics.*

Keywords— learning styles, mathematics, performance, high-school, teaching strategies

1. INTRODUCTION

Mathematics is extremely vital in everyday life. Learning mathematics is beneficial for students to think critically and have improved reasoning skills it developed their ability to tackle challenges especially in problem solving. It is the topic that most students despise or enjoy (Prayaag and Abraham, 2017). Because of the formulas and rules that are contained in this subject, students tend to develop negative concerns towards this subject, they struggle in learning mathematics at some point. But with the help of mathematics teachers, they must experiment with different learning styles in learning mathematic subject. Learning styles are the composite of factors writes Keefe (1979 in Ariola, 2012).

Also learning is influenced by the educational teachers in which a student learns according to Stewart and Felicita (1992). Therefore, learning style is concerned with how students learn rather than what the students need to learn. They want it to learn in the simplest way possible. Knowledge and education are the foundations for all that may be attained in life. Teachers provide today's youngsters with the power of education, allowing them to have a brighter future.

Teachers help pupils understand abstract topics by simplifying the complicated. Teachers also introduce students to concepts and subjects that they would not have encountered otherwise. They can broaden their pupils' interests and challenge them to accomplish better. Teachers do not tolerate failure; thus, kids are more likely to achieve. Teachers understand when to push students, when to gently guide them in the correct way, and when to let them figure it out on their own. They will not, however, allow a pupil to give up. (Nair, 2023)

A student's method of learning is referred to as their learning style. A person's preferred method of information intake, processing, comprehension, and retention is referred to as their learning style. Visual learners learn best from flash cards and like to utilize diagrams, graphs, and visuals to organize and explain their ideas. Auditory learners favor listening, debating, talking about, and memorizing in class. Audiobooks are preferable than print ones for teaching purposes. The greatest way for tactile learners to learn is by touch and movement; they look for opportunities to participate in demonstrations, write, or construct models. Kinesthetic learners prefer to use their entire body while learning; they transmit ideas with gestures and do best in a hands-on setting. (Top Hat, 2019)

OBSERVED TEACHING STRATEGIES BY THE STUDENT RESPONDENTS

Being the central figure in education, instructors need to be skilled and knowledgeable to pass on what knowledge they have to their students. Good instruction is done in a very individualized way. Teaching that is effective cares for the student's whole growth and who he is as a person. The teacher must consider the unique characteristics of each of his or her students and modify the lesson plan accordingly. It is a truth that teachers play a variety of important functions in the classroom. As a part of the teachers' work or purpose, they meet them every day. To have motivated students in the classroom, it is crucial that we comprehend the necessity to be driven to accomplish our work properly. When kids are driven to learn, it will be simple for them to do so. However, the function of the instructor in inspiring children to learn is quite difficult. Just to pique pupils' attention, a range of instructional methods must be used. The instructor must first acquire

STUDENT'S LEARNING STYLE

sufficient resources for teaching. (“The Effect of the Teacher’s Teaching Style on Students’ Motivation,” 2019)

II. METHODOLOGY

RESEARCH DESIGN

The study employed a descriptive-correlational research approach. Descriptive study merely summarizes the sample population's characteristics and/or behavior. 2016 (Dudovskiy). Because it illustrates how the understanding of learning styles and teaching techniques responds to improving the teaching and learning of mathematics, quantitative descriptive designs are also used. Additionally, it describes and explores the quantitative exploration design, focusing on the executions, structures, and designs that have an impact on the results and require careful attention. It offers strategies for the conceptualization, comprehension, and design of the study by Bloomfield & Fisher (2019)

RESEARCH QUESTIONS

1. What are the learning styles and teaching strategies towards improving the teaching and learning of mathematics?
2. Is there a significant difference on the styles and learning strategies of education in the perspective as observed among the interviewees?

PARTICIPANTS OF THE STUDY

The subjects of the study are the professional educators and students in Northwestern Agusan Colleges, - in high school department, a private institution. They consist of teachers in Mathematics in all.

Male	Female	Population
93	90	183

RESEARCH INSTRUMENTS

The questionnaire contains demographic questions – for teachers- such as name, age, gender, and years of teaching. Also, demographic profile is being asked for the students such as name, age, grade level. The instrument is based on a 5-point Likert scale: strongly disagree, disagree, 3-undecided, agree, and strongly agree. The questionnaire has 60 questions for the students’ learning styles and 49 questions for the teaching strategies. This paper summarizes the section on the development of teachers' skills to think and express themselves through teaching techniques. Reliability and validity analysis was used in this study. Also, the researchers created questionnaires for the students as part of their respondents.

STATISTICAL TOOL

Frequency - this will describe the composition of the population.

Likert Scale - measures the participants understanding and opinions.

Average Weighted Mean - an average computed by giving different weights to some of the individual values.

Standard Deviation - a summary measure of the differences of each observation from the mean.

DATA ANALYSIS

Table 1. Means, frequencies, and percentages were among the descriptive statistics that were utilized to outline the fundamental characteristics of the study's data. The math grades of the pupils were examined using the indicators that the Philippine Department of Education (DepEd) mandated.

Table 1. Descriptors, grading scale and remarks

Descriptors	Grading Scale	Remark
Outstanding	90-100	PASSED
Very Satisfactory	85-89	PASSED
Satisfactory	80-84	PASSED
Fairly Satisfactory	75-79	PASSED
Did not meet Expectations	Below 75	FAILED

Finding the relationship between teaching methods and learning style and academic achievement required the application of inferential analysis techniques like multiple linear regression. It explicitly identifies which teaching methods and learning styles have a major impact on senior high school students' academic achievement. The most popular type of linear regression analysis is multiple linear regression (MLR). Multiple linear regression is a predictive methodology that explains the relationship between one continuous dependent variable and two or more independent variables. With dummy codes, the independent variables were categorical. The student's final grade or average served as the study's dependent variable.

III. Result and discussion

Profile of the student respondents

Table2. It indicates that most of the student respondents have a mix of dependent, participant-driven, and cooperative

learning approaches. They're students who take pleasure in cooperating with their peers. 43 percent of the students have independent learning styles. Such students are more likely to like to work alone.

Table 2. Students' learning styles

Students' learning styles	f	%
Dependent	36	19.8
Collaborative	43	23.6
Independent	28	15.4
Participant	44	24.2
Competitive	25	13.7
Avoidant	6	3.3
Total	182	100.0

In this table, the highest learning style is participant; it has a total frequency of 44 and a total percentage of 24.2%, while the dependent has a total frequency of 36 and a percentage of 19.8%, the collaborative has a total frequency of 43 and a percentage of 23.6%, the independent has a total frequency of 28 and a percentage of 15.4%, the competitive has a total frequency of 25 and a total percentage of 13.7%, the avoidant has a total frequency of 6 and a total percentage of 3.3%, the total of all the frequency is 182 while the total percentage is (100%).

PROFILE OF THE TEACHER RESPONDENTS

Table 3. Presents the profile of the teacher respondents. A mathematics teacher is composed of three females. From these three teachers, they were aged 20–29 years old. Each teacher has their own civil status as single. Most of them were teaching mathematics for 1-3 years.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	88.770	1.945		45.651	.000
Independent	-.002	.093	-.004	-.023	.982
Avoidant	.092	.078	.168	1.173	.242
Collaborative	.006	.082	.010	.072	.943
Dependent	-.022	.093	-.035	-.237	.813
Competitive	-.021	.071	-.038	-.294	.769
Participant	-.100	.083	-.159	-1.194	.234

Table 3. Profile of the teacher respondent

Demographic Profile	f	%
Age		

20 – 29 years old	3	1
30 – 39 years old	0	0
40 – 49 years old	0	0
n	3	1
Sex		
Male	0	0
Female	3	1
n	3	1
Civil Status		
Single	3	1
Married	0	0
n	3	1
Number of years as a Math Teacher		
Less than a year	0	0
1 – 3 years	3	1
more than 5 years	0	0
n	3	3

Teaching strategies applied by the teacher respondents.

Three teachers used demonstration, and three instructors used cooperative learning. This supports the pupils' assessment that demonstration and cooperative learning were the two most often used instructional techniques by their mathematics instructors.

Regression analysis.

Table 4. The summary output of regression statistics of academic performance in learning style.

This table shows the significant effect of the factor Constant has a total significance of.000, and then the Independent has a significance of.982, while the Avoidant has a significance of.943, and then the Collaborative has a total significance of.943, and then the Dependent has a total significance of.813, while the Competitive has a total significance of.769, and lastly, the Participant has a total significance of.234

IV. CONCLUSION

The study offers talks of how teaching methods and student learning styles affect students' academic achievement in mathematics. This supports the arguments made in the literature now in publication that understanding students' learning styles is the first step toward improving their academic performance in mathematics. Teachers will benefit greatly from knowing their students' learning preferences when creating and executing a certain approach that works for them. These are a few of the useful strategies that math teachers can use to students' academic lives who don't discover any internal drive-in numerical methods. There is still more that needs to be done and considered. account to enhance high school pupils' academic achievement in numerical methods. When the processes of teaching and learning are functioning well, a special form of between those two independent parties—a relationship a conduit, link, or bridge that connects the student and the instructor. Teachers will be guided by their awareness of the diversity of their students and their distinct learning styles. when creating various tactics. These will facilitate learning and improve pupils' academic success in math's.

V. RECOMMENDATION

1. Engage students through active learning: Incorporate hands-on activities, group discussions, and problem-solving exercises to encourage active participation and critical thinking. This approach helps students develop a deeper understanding of mathematical concepts.
2. Employ real-world applications: To help pupils understand mathematical concepts better, relate them to problems they may encounter in the real world. They may see the real-world applications of what they are learning, which can increase their motivation and comprehension.
3. Offer tailored assistance: Acknowledge that every learner possesses distinct learning modalities and capacities. Provide individualized support, such as one-on-one tutoring or differentiated assignments, to children who might require extra assistance or challenge.
4. Employ technology: Incorporate technological tools, including internet resources, instructional applications, or graphing calculators, to improve learning possibilities and provide students the chance to explore mathematical ideas interactively.
5. Encourage a growth mindset by highlighting the idea that skills can be acquired with work and repetition, as well as by encouraging a positive attitude toward studying mathematics. Stress the value of tenacity and taking lessons from your mistakes.

6. Work together: Take advantage of professional development opportunities and work together with other math instructors to discuss best practices, brainstorm ideas, and remain up to current on cutting edge instructional strategies. Both student results and the efficacy of instruction may benefit from this.

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