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Cognitive Strategies and Learning Styles of High and Low Performance of Elementary School Students

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Abstract

This study investigated the role of cognitive strategies and learning styles in the academic performance of elementary pupils. The study made use of the descriptive correlational research design. A total of 285 pupils were randomly selected from a population of 1147 pupils using the Slovene's Formula for Sample Size Determination. Standard validated questionnaires were adapted and used in data gathering. The results revealed that at higher grade levels, high performing pupils tend to use cognitive strategies more than low performing pupils, and therefore produced a very satisfactory academic performance compared to low performing pupils. The results further indicated that high performing pupils learn best by remembering, organizing, and looking for assistance, and they use these strategies naturally. They also seek help when they find difficulties in their studies, and constantly monitor their progress. Moreover, low performing students prefer to learn with musical background whereas high performing pupils prefer to study in a quiet room. High performing pupils love solving puzzles and similar activities which low performing pupils do not appreciate. Likewise, they move a lot compared to low performing pupils. They learn best in mobile activities and are more adept in the use of language as a tool in learning and have higher visual ability compared to low performing pupils. It is therefore suggested that teachers should identify the learning-style preferences of the pupils so that selection of appropriate instructional methods and materials could maximize pupils' learning.

Introduction

Presently, most research on educational psychology and learning is an outcome of the theoretical paradigm from a constructivist into a socio-constructivist. The socio-constructivist approach emphasizes that knowing is jointly constructed as part of an individual. This means that one cannot objectively define environment interaction, and it cannot be subjectively created as well. The focus of most traditional learning research is on cognitive learning (Ibrahim & Abd, 2016).

Several researchers have reported on cognitive strategies. The study by Hazzard (2016) explains that cognitions are dispersed acts that are connected with different activities. It comprises students' interaction in

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a purposeful manner over time with other persons, and social, physical, and intellectual resources. Francois (2016) highlights that the students' learning environment is influenced by dynamic technological change. It has, therefore, become very essential to understand how learners interact with different learning environments and methods. It is emphasized that even though it is important to analyze the interaction processes between a learner and his environment, it is not possible to define the exact factors involved. Cognitive strategies and learning styles have important implications for elementary pupils because once these pupils enter high school or college, they become primarily responsible for their own learning.

Studies demonstrate that cognitive strategies are indeed predictive of student outcomes. Interestingly, the strategy of self-consequences is affiliated with secondary education. This implies that pupils in elementary who are more aware of their cognitive strategies and learning styles may be more likely to do better in secondary education. Educational theorists feel that educational systems should make an increased commitment to teaching learners how to properly process information by utilizing effective cognitive and metacognitive strategies when faced with academic challenges.

It is the objective of the Philippine government to equip elementary pupils with cognitive abilities necessary in higher education, however, elementary schools do not have adequate teaching and learning materials (Sadeghi, Kasim, Tan, & Abdullah, 2010). In the Department of Education (DepEd) Northern Samar Division, there has been a decrease in the general performance of elementary and secondary students in the last three years. Indeed, the decreasing trend in the general performance of young learners in this part of the country should alert teachers and administrators to take necessary interventions (Lubrica, Montemayor, Botengan, Alvaro, Capili, Yango, Angiwan, & Gallardo, 2012).

As an elementary school teacher, the author observed students who seemed to spend a lot of time writing vocabulary in pocket notebooks. This strategy is considered an excellent learning strategy. However, when the same students were asked questions about the same vocabulary, they were not able to answer. It could be inferred from this that the use of a particular learning strategy is not a guarantee for cognition. Did the students' cognitive or learning strategy not fit them? Perhaps a deeper understanding of this issue is necessary to answer the question. Students who are aware of their learning by initiating and sustaining cognitive processes such as setting learning goals, monitoring their progress, and making adjustments accordingly, are more likely to succeed in future undertakings. It is based on these issues which led the author to develop the concept that high performing students use specific cognitive strategies and adopt individual learning styles differently from low performing students.

Objective

The central objective of this study was to determine the cognitive strategies and learning styles of high performing and low performing students and how they affect students' performance in elementary schools in Catarman, Northern Samar.

Conceptual framework

This study will assess the influence of cognitive strategies and learning styles of elementary pupils in Catarman, Northern Samar. These factors are assumed to affect the school-ability of the children based on the SRL theory of Azevedo & Aleven (2013). A cognitive strategy is not just about finding a solution to a problem. It is also about finding ways or components that would make the process easier. Thus, for pupils to solve a particular problem, they must come up with strategies suited to their ability in dealing with the subject. From this perspective, it is assumed that pupils who use one or more strategies and learning styles will have higher academic performance.

Additionally, age, sex, grade level, previous honors received, academic performance and socioeconomic status of parents are conceptualized to show the relationship with cognitive strategies and learning styles. It is assumed that older pupils will use varied components compared to younger pupils. On the other hand, females will have different learning components from males because of individual differences. Each sex type will have components that suit or go along with their natural likes. In addition, higher grade levels would have taught them to develop and adopt learning components that work for the best. Lastly, a previous honor received is likely to affect the problem-solving ability of respondents. Pupils who have proven themselves in a previous grade are expected to use more strategies and styles than other pupils.

These key operational definitions were used in the study: High Performing Pupils - This refers to the pupils who belong to the upper 30 percent of the class

ranking for the latest grading period. Low Performing Pupils- conceptually and operationally refers to the pupils who belong to the bottom 30 percent of the class ranking for the last grade level. Academic Performance-conceptually and operationally refers to the final rating earned by the pupils in all the subjects for the 1st and 2nd grading periods in the school year 2016-2017.

Figure 1 shows the relationships between the independent and dependent variables of the study. The independent variables (i.e. profile in terms of age, sex, grade level and honors received and cognitive strategies in terms of memory strategy, goal setting, self-evaluation, seeking assistance, environmental structuring, learning responsibility, and organizing) are assumed to predict academic performance.

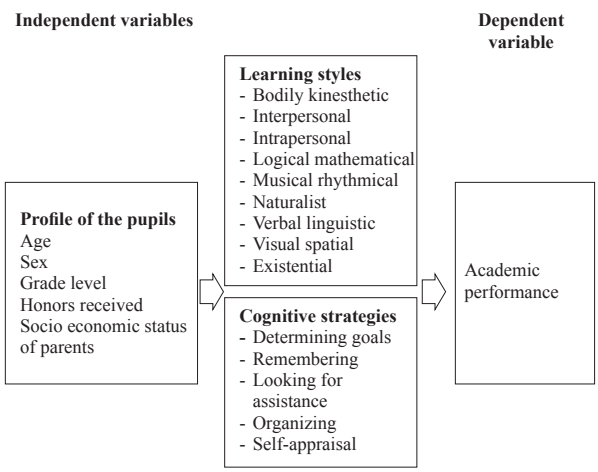

Figure 1 Conceptual framework

Research methodology

1. The locale of the study

This study was conducted in five municipalities of the Northern Samar, namely: Catarman, Bobon, San Jose, Mondragon, and Lope de Vega. Catarman hosts four school districts with 36 elementary schools. The second municipality, Bobon has two school districts hosting 19 elementary schools. The third, San Jose, contains nine elementary schools. The fourth, Mondragon has two school districts with a total of 17 elementary schools.

The fifth, Lope de Vega hosts seven elementary schools. All the elementary schools in the five municipalities were selected for the study.

2. Research design

A descriptive correlational research design was used in this study. Cognitive strategies and learning style components were conceptualized as predictors of academic performance of the pupils. In addition, personal circumstances were also investigated as possible factors that influence cognitive strategies and learning styles. Specifically, age, sex, grade level, and previous honors received were posited as factors that affect cognitive strategies, learning styles and academic performance. Considering the large size of the population, the sample size was computed using Slovin's formula. After determining the sample size, it was distributed among the randomly selected elementary schools from different municipalities. Distribution of the sample was made proportionately among the different schools, thus, schools withlarge populations had a bigger share of pupil-respondents. Small schools, on the other hand, had a lesser number of pupil-respondents. The high performing and low performing pupils were selected by the class advisers based on their previous grade level ranking. The following table summarizes the distribution of the respondents.

Table 1 Distribution of the respondents

Municipality	Population	Total sample high performing	Low performing	Total
Catarman	287	43	38	81
Bobon	229	32	37	69
San Jose	218	25	27	52
Mondragon	215	25	23	48
Lope de Vega	198	17	18	35
Total	**1147**	**142**	**143**	**285**

3. The variables

The variables included in this study consisted of independent variables and a dependent variable. Independent variables were respondents' profiles, i.e. age, sex, grade level, and previous honors received. Another independent variable was the respondents' cognitive strategy. This composed of determining goals, remembering, looking for assistance, organizing, and self-appraisal.

The third independent variable was learning style. It consisted of a bodily-kinesthetic, intrapersonal, interpersonal, logical-mathematical, musical rhythmical, naturalist, verbal-linguistic, visual-spatial and existential are also considered as independent variables. The dependent variable was the academic performance of the pupil-respondents.

4. Research instruments

The 37-item instrument (Cognitive Strategies

Inventory-CSI) was constructed by Martinez-Pons (2002). Each participant was rated based on their answers to each statement in terms of how frequently they used the strategy. The scale measured five cognitive strategies that included determining goals, remembering, looking for assistance, organizing, and self-appraisal. The measure constructs validation, specifically convergent validity of the scale and standardized measures of pupils' achievement. The items were translated to the Filipino language to facilitate a better understanding on the part of the pupil-respondents.

Learning Styles Inventory. The 90-item instrument contains nine dimensions with 10 indicators for each dimension. It was adapted from the article of Armstrong, Multiple Intelligences in the Classroom (Armstrong, 2009). This instrument had already been validated by the authorities and was used in previous studies locally and internationally as stated in the literature.

The nine dimensions include Kinesthetic, Intrapersonal, Interpersonal, Logical, Musical, Naturalist, Verbal, Visual and Existential. Kinesthetic learning style requires that the learner touch material to learn. Kinesthetic techniques are used in combination with visual and/or auditory study techniques, producing multi-sensory learning. Intrapersonal learners are students who prefer working alone. These are self-motivated learners, set individual goals, study by themselves with their own thoughts and ideas rather than with others.

Interpersonal learning has to do with a learner's ability to interact with and understand other people and social situations. Logical learning style has to do with a learner's ability to reason, solve problems, and learn using numbers, abstract visual information, and analysis of cause and effect relationships.

Musical learning style refers to a learner's ability to understand and process sound, rhythm, patterns in sound, relationships between sounds, and ability to process rhymes and other auditory information. Naturalistic learners are instinctively interested in and aware of their surroundings. They are able to learn very easily outdoors and are drawn to working with nature. They enjoy opportunities to learn about living things, like plants, animals, and other biology-related subjects, and natural events, such as weather or geology.

The verbal learning style involves both the written and spoken word. Learners who use this style find it easier to express themselves both in writing and verbally. Visual learners prefer using images, pictures, colors, and maps to organize information and communicate with others. Existential intelligence is the ability to use intuition, thought and meta-cognition to ask (and answer) deep questions about human existence (Armstrong, 2009).

5. Validation of instruments

Content validation of the instrument on cognitive strategies was necessary because the items were adapted from a foreign author. Although the items were used in scientific research abroad, the items were localized to suit the local respondents' level of thinking and reading skills. The items were shown to experts on scale development as well as education program supervisors in the DepEd. On the other hand, the learning styles inventory had already been validated by master teachers from the DepEd when it was administered in the study of Las Marias. Hence, no validation was necessary to establish its functionality.

6. Data gathering procedure

The researcher sought permission from the school division superintendent to conduct the study in Catarman districts, after which the researcher then coordinated with the respective school administrator of the schools for the distribution of the questionnaire. The respondents were instructed and assisted by the researcher while answering the instruments.

7. Statistical treatment

The data for each respondent was scored by taking average scores on the items. Separate scores were obtained for each use of strategy. The mean scores of the pupils on each scale were regressed with the academic performance of the pupils. The bivariate relationship of determining goals, remembering, looking for assistance, organizing, and self-appraisal with academic performance was established using Pearson r. In the presentation of respondents' age, sex, grade level, and honors received from the previous grade and socio-economic status of parents, level of manifestation on different cognitive strategies, and academic performance, descriptive statistics were used. This included frequency counts and percentages. In addition, the weighted mean was used in the presentation of respondents' ratings for the items on the CSI instrument.

Multiple regression analysis was used to test the effect of personal profile variables on cognitive strategies and learning styles. A similar statistical tool was used to test the relationship between cognitive strategies and academic performance.

Lastly, multiple regression analysis was also

used in determining the effect of learning styles on academic performance (Kendeou, 2014).

Results

1. Cognitive strategies of high performing and low performing pupils

The cognitive strategies of respondents were determined based on factors such as goals, remembering, looking for assistance, organizing and self-appraisal were considered. With regards to goals, both the high performing and low performing pupils had a low manifestation of cognitive strategy. Although high performing pupils had a mean of 2.54 compared to 2.10 for the low performing group, both means were interpreted as low. This finding shows that these pupils do not use this strategy. It implies that both types of learners do not make notes to remind them about school activities.

In terms of remembering as a cognitive strategy, both types of learners registered a moderate use with a sub-mean of 2.95 and 3.14, respectively. The low performing group had a higher mean which means that most pupils from this group are using this strategy compared to the high performing group. It could be inferred that the low performing pupils make an outline of the topics they need to study. In addition, the low performing pupils read notes while studying whereas high performing pupils do not use this strategy. This finding, however, contradicts the conclusion of Bergin & David (2009) that taking notes is a natural behavior of high performing pupils.

As to the strategy of looking for assistance, the high performing group had higher sub-mean of 3.67 (high) compared to 2.72 (moderate) sub-mean under the low performing group. This finding means that high performing pupils enjoy group work because of cooperation and they regularly ask for help from classmates or friends compared to low performing pupils. This finding confirms the study of Francois (2016) that pupils with help-seeking ability perform better compared to pupils who do not look for help from peers or other people. The detail results are provided in Table 2 below.

2. Learning Styles of the pupil-respondents

The learning styles of the respondents were determined by considering the factors of bodily-kinesthetic, intrapersonal, interpersonal, logical-mathematical, musical rhythmical, naturalist, verbal-linguistic, visual-spatial, and existential. In Table 3 the high performing pupils manifested high extent in kinesthetic activities compared to low performing pupils. This means that high performing pupils do not learn best by sitting still for long periods of time. They like working with tools and learn them by doing.

Table 2 Cognitive strategies of high performing and low performing pupils

Cognitive strategies	High performing		Low performing	
	WM	INT	WM	INT
Determining Goal	2.54	Low	2.10	Low
Remembering	2.95	Moderate	3.14	Moderate
Looking for Assistance	3.67	High	2.72	Moderate
Organizing	3.09	Moderate	2.49	Low
Self-appraisal	2.19	Low	1.73	Very low
Mean	**2.83**	**Low**	**2.44**	**Low**

The results also show that the intrapersonal type of intelligence did not manifest on both types of learners. Both groups had less manifestation, suggesting that they are not keenly aware of their beliefs and attitudes. This is however understandable considering their age or maturity level. Most pupils have not yet developed their moral beliefs and how their attitudes affect learning.

The interpersonal skill of high performing pupils was found to be at a high extent compared to the moderate extent of the low performing group. This means that the high performing group considers study groups as productive compared to low performing pupils. They also learn best by interacting with others and watching television shows. The high performing pupils are also more active in school clubs and other extracurricular activities compared to low performing pupils.

In terms of logical learning style, high performing pupils manifested high extent with a mean of 3.43 while low performing pupils registered a mean of 2.81, considered to a moderate extent. This means that high performing pupils use step by step directions in doing their task. They keep things neat and orderly and get easily frustrated with disorganized people. This type of pupils can easily calculate musical intelligence mentally compared to a moderate level for the high performing pupils. This means that low performing pupils focus on noise and sounds and are always interested in musical instruments compared to high performing pupils. This finding implies that low performing pupils are inclined to listening to music compared to high performing pupils.

Table 3 depicts the level of manifestation in the naturalist learning style of high performing and low performing pupils. It shows that low performing pupils had moderate manifestations in the learning style while the high performing group had less extent of manifestations. This finding shows that underperforming

pupils enjoy categorizing things by common traits. The ecological issues, however, are not important to both types of learners. It should be noted that low performing pupils consider animals as important to their lives. This is contrary to the manifestations of high performing pupils where they do not consider the animals as important to them.

In terms of verbal intelligence, the high performing pupils had high manifestation compared to the low performing pupils with less manifestation. This means that high performing pupils enjoy all kinds of materials in school; they take notes to help them understand better. They keep a journal and it is easy for these high performing pupils to explain ideas to others compared to low performing pupils. This finding implies that high performing pupils have better communication skills compared to the low performing pupils.

It was also found that the high performing pupils have a moderate manifestation in visual style, higher than the manifestations of the low performing pupils. This means that high performing pupils can imagine ideas in their mind to a moderate extent. Three-dimensional puzzles bring enjoyment to this type of learner. They can easily create art using varied media and good at reading maps and blueprints. According to Villegas (2011), a visual learning style is a characteristic of high performing pupils. The researcher added that visual learners absorb more information compared to other learning styles.

In terms of existential intelligence, the results highlight that both types of learners had less manifestation. This means that both high performing and low performing learners have a low understanding of religion and the universe in general. This is however expected as young learners do not yet have a grasp about life or religion. These learners do not enjoy discussing or reading issues that do not affect them directly. Table 3 provides a summary of the respondents' learning styles.

Table 3 Learning styles of the pupil-respondents

Learning styles	High performing		Low performing	
	WM	INT	WM	INT
Kinesthetic	3.66	High extent	3.11	Moderate extent
Intrapersonal	2.48	Less extent	2.03	Less extent
Interpersonal	3.50	High extent	2.77	Moderate extent
Logical	3.43	High extent	2.81	Moderate extent
Musical	2.71	Moderate extent	3.43	High extent
Naturalist	2.46	Less extent	2.76	Moderate extent
Verbal	3.59	High extent	2.48	Less extent
Visual	3.06	Moderate extent	2.50	Less extent
Existential	2.58	Less extent	2.11	Less extent
Mean	**3.05**		**2.67**	

3. Academic performance of high performing and low performing pupils

The academic performance of the pupils is presented in Table 4. It shows that the majority of the high performing pupils had a very satisfactory rating whereas the low performing pupils had a satisfactory rating. More than 20 percent of the pupils in the high performing group had outstanding performance while only two from low performing group. This finding describes the discrepancy in the performance of the two groups of learners. This could be implied that the cognitive strategies and learning styles of the high performing pupils are really working for them to succeed academically.

The table also shows that 1.41% of the high performing pupils had fair academic performance while 1.40 % of the low performing group had an outstanding rating. This could be traced to the fact that sampling was based on previous grade-level academic performance. This means that some of the pupils who were high performing in the previous grade manifested low performance in the current year. This pattern is similar to the low performing group.

Table 4 Academic performance of high performing and low performing pupils

Academic performance	High performing		Low performing	
	F	%	F	%
Outstanding (90% above)	31	21.83	2	1.40
Very Satisfactory (85%-89%)	88	61.97	14	9.79
Satisfactory (80%-84%)	21	14.79	99	69.23
Fair (75%-79%)	2	1.41	28	19.58
Total	**142**	**100.00**	**143**	**100.00**

4. Difference in cognitive strategies of high performing and low performing pupils

The T-test for independent samples was used to test for a significant difference in the cognitive strategies between high performing and low performing pupils. Significant differences were found in looking for assistance, organizing and self-appraisal cognitive strategies. This means that the means in these strategies of high performing pupils were significantly higher compared to the means of low performing pupils. The findings imply that high performing pupils develop their knowledge by seeking assistance when they find difficulties in their studies. They are not shy in asking for help as long as they will learn from it. This is in accordance with the findings of Bednall & Kehoe (2011) that intelligent students are very good at seeking help from more knowledgeable peers. They are also good at

organizing things and constantly monitor their progress. These findings reflect the conceptualization of Bednall & Kehoe (2011). that high performing pupils use different strategies in different settings or problems. Compared to low performing pupils, high performing pupils use varied cognitive strategies in order to excel in class. Low performing pupils use cognitive strategies different from the strategies used by high performing pupils.

The T-test for independent samples was again used to test for a significant difference in the learning styles of high performing and low performing pupils. Table 5 shows that the high performing pupils differed significantly from the low performing pupils in musical, logical, kinesthetic, verbal, and visual. In musical, the high performing pupils had significantly lower mean compared to low performing pupils. This means that low performing pupils are into a musical type of intelligence. They like to learn with background music compared to high performing pupils. However, the significant difference in logical means of the high performing pupils was very good in logic and mathematical inference. These students love solving puzzles and other activities which low performing pupils do not appreciate. There was a significant difference in kinesthetic means, meaning that high performing pupils move a lot compared to low performing pupils. These pupils learn best when learning involves mobile activities.

A significant difference was also observed in verbal and visual styles implying that high performing pupils are adept in the use of language as a tool in learning. No wonder that most high performing pupils were good at absorbing information written on the board. This means that high performing pupils also had higher visual ability compared to low performing pupils. It could also be inferred that high performing pupils use communications regularly to develop their cognitive ability. They learn best in doing this kind of activity.

Table 5 Difference in cognitive strategies and learning styles of high performing and low performing pupils

	High performing	Low performing	t	Sig.	Interpretation
Cognitive strategies	2.89	2.43	8.621	0.042	Significant
Learning styles	3.05	2.67	8.232	0.044	Significant
Overall	**2.97**	**2.55**	**8.427**	**0.043**	**Significant**

5. Relationship between profile and cognitive strategies

Pearson correlation was used to test for the relationship between pupils' profile and cognitive strategies (Table 6). Age was found to have a significant correlation with determining goals, organizing, and self-appraisal. The older pupils seemed to have higher means on the cognitive strategies compared to younger pupils. This finding, however, did not support the conclusion of Chan, (2010) that cognitive strategies have no association with age because cognitive style is fixed, innate, and determines an individual's preference for structure within problem-solving.

Female pupils had higher means of help-seeking strategy. It means that, compared to their male counterpart, female pupils seek help from their peers or friends. This is similar to the findings of that female students are not shy in asking questions from peers or teachers. The socio-economic status of parents was found to significantly correlate with determining goals and looking for assistance. This finding means that pupils from high-income families are good at establishing their goals or tasks. These findings confirm the conclusion of Sadeghi, Kasim, Tan, & Abdullah (2010) that pupils from well-off parents are good in cognitive strategies. They also seek assistance from their peers when necessary. However, gender did not correlate with cognitive strategies (Hartwig & Dunlosky, 2012).

6. Relationship between profile and learning styles

Pearson correlation r was also used to test for a significant relationship between the profile and learning styles of the pupils. Age was found to significantly correlate with bodily-kinesthetic, logical-mathematics, and musical-rhythmical. These findings mean that, compared to younger pupils, older pupils had a high manifestation of these three learning styles. However, this finding should not be interpreted that older pupils would have the higher ability on these learning styles because this would contradict the theory of Gardner that styles or intelligence are naturally occurring. Sex was found to significantly correlate with interpersonal style; implying that female pupils learn best by interacting with other pupils. They like to be in the crowd and have fun with their friends.

Pupils who received honors from the previous grade had higher manifestations in bodily-kinesthetic and interpersonal styles. This implies that these pupils learn best by using different tools or materials. They also love to be with their friends to do school tasks. The socio-economic status of parents had a significant relationship with bodily-kinesthetic, interpersonal, and verbal-linguistic. This could imply that families of the pupils with higher monthly income showed higher

manifestations in bodily-kinesthetic intelligence and learning style. They learn best through bodily movement or handling materials. These students also like to be in the crowd and love to learn things through interaction with peers. They have good communication skills and are good at expressing their ideas.

Table 6 Relationship between profile and cognitive strategies

Pupil's profile	Parameters	Determining goals	Remembering	Looking for assistance	Organizing	Self-appraisal
Age	Pearson r	0.442	0.088	0.089	0.380	0.420
	Sig. (2-tailed)	0.020	0.288	0.088	0.021	0.021
	Interpretation	Significant	Not Significant	Not Significant	Significant	Significant
Sex	Pearson r	0.109	0.109	0.624	0.079	0.109
	Sig. (2-tailed)	0.524	0.065	0.020	0.360	0.360
	Interpretation	Not Significant	Not Significant	Significant	Not Significant	Not Significant
honors received in the previous grade-level	Pearson r	0.449	0.091	0.344	0.403	0.099
	Sig. (2-tailed)	0.029	0.311	0.021	0.002	0.381
	Interpretation	Significant	Not Significant	Significant	Significant	Not Significant
Socio-economic status of parents	Pearson r	0.449	0.091	0.344	0.086	0.109
	Sig. (2-tailed)	0.029	0.311	0.021	0.381	0.381
	Interpretation	Significant	Not Significant	Significant	Not Significant	Not Significant

7. Relationship between profile and academic performance of the respondents

Multiple regression analysis was used to test the hypothesis on the relationship between profile and academic performance of the pupils. Table 7 shows that sex and honors received in the previous grade-level significantly predicted academic performance. The positive sign for the beta coefficient under sex can be interpreted that female pupils had higher academic performance compared to the males. Besides, pupils who received honors in the previous grade also had higher academic performance in their present grade.

The finding that age does not significantly predict performance means that age does not necessarily mean higher performance. This contradicts the studies conducted by Butler (2010) that cognitive strategies in specific academic contexts and with a variety of age and achievement levels are predictive of academic success across ability groups, age, and subject areas. Similarly, the higher-income of parents does not result in higher performance on the part of the pupils. Other factors could have affected pupils' performance. Some of these are cognitive strategies and learning styles.

8. Relationship between cognitive strategies and learning styles and academic performance

Multiple regression analysis was used to analyze the effect of cognitive strategies and learning styles of pupils on their academic performance. On cognitive strategies, remembering and looking for assistance significantly predicted academic performance of the pupils. This means that pupils who outline the topics they need to study and take notes during class are effectively using this strategy for better performance. This strategy works well for both high performing and low performing pupils. However, Hartwig & Dunlosky (2012) found in their study that most students frequently used the components of monitoring one's learning, organizing, and transforming study materials. The results of this study support the study of Budé, Imbos, van de Wiel, & Berger (2011) that cognitive strategy may be an important predictor of academic success among students. However, a goal-setting that has been found to significantly correlate with academic performance. Similarly, pupils who regularly seek assistance from peers and enjoy group activities had higher performance. This finding implies that teachers should consider activities that involve collaboration among the pupils.

Table 7 Relationship between profile and academic performance of the respondents

Pupil's profile	Parameters	Academic performance
Age	Beta	0.099
	Significance	0.239
	Interpretation	Not Significant
Sex	Beta	0.723
	Significance	0.011
	Interpretation	Significant
Honors received in previous grade level	Beta	0.872
	Significance	0.001
	Interpretation	Significant
Socio-economic status of parents	Beta	0.101
	Significance	0.344
	Interpretation	Not Significant

On the learning styles, interpersonal, logical mathematics and verbal-linguistic significantly predicted

academic performance. The positive sign for the interpersonal beta coefficient suggests that pupils who regularly interact with others and enjoy being with other people had a high academic performance. Similarly, pupils who are good at reasoning and mathematics had high academic performance. Lastly, pupils who enjoy reading, taking notes, and word puzzles also had higher academic performance.

Table 8 Relationship between cognitive strategies and learning styles and academic performance

Pupil's profile	Parameters	Academic performance
Determining goals	Pearson r	0.098
	Sig. (2-tailed)	0.434
	Interpretation	Not Significant
Remembering	Beta	0.402
	Significance	0.011
	Interpretation	Significant
Looking for assistance	Beta	0.523
	Significance	0.009
	Interpretation	Significant
Organizing	Beta	0.1011
	Significance	0.0831
	Interpretation	Not Significant
Self-appraisal	Beta	-0.1098
	Significance	0.423
	Interpretation	Not Significant
Bodily kinesthetic	Pearson r	0.0.983
	Sig. (2-tailed)	0.29
	Interpretation	Not Significant
Intrapersonal	Beta	0.999
	Significance	0.54
	Interpretation	Not Significant
Interpersonal	Beta	0.593
	Significance	0.023
	Interpretation	Significant
Logical mathematical	Beta	0.59
	Significance	0.004
	Interpretation	Significant
Musical rhythmical	Beta	0.111
	Significance	0.0923
	Interpretation	Not Significant
Naturalist	Beta	-0.101
	Significance	0.0923
	Interpretation	Not Significant
Verbal linguistic	Pearson r	0.582
	Sig. (2-tailed)	0.008
	Interpretation	Significance
Visual spatial	Beta	0.109
	Significance	0.555
	Interpretation	Not Significant
Existential	Beta	0.112
	Significance	0.52
	Interpretation	Not Significant

Conclusion and implications

The following conclusions were made from the results of this study: Among older students (grade 6), high performing pupils tend to use more cognitive strategies than low performing pupils and therefore produced a very satisfactory academic performance compared to low performing pupils. Cognitive strategies of pupils, therefore, affect the academic performance of the pupils. Pupils think and learn differently from each other. High performing pupils learn best by remembering, organizing, and looking for assistance, and they use these strategies naturally. High performing pupils seek help when they find difficulties in their studies. They are also good at organizing things and constantly monitor their progress. Outlining and note taking are good strategies in remembering things since they work well in both groups. Pupils who are good at reasoning and mathematics had high academic performance, as well as, pupils who enjoy reading, taking notes and word puzzles had a higher academic performance.

High performing pupils prefer to study in a quiet room while low performing students prefer to learn with a musical background. It implies that teachers should consider different learning climate for different types of learners.

High performing pupils love solving puzzles and other activities which low performing pupils do not appreciate. In addition, high performing pupils move a lot compared to low performing pupils. They learn best in mobile activities. It implies that teachers should consider mobile activities in teaching the lessons.

High performing pupils are more adept in the use of language as a tool in learning and they had also higher visual ability compared to low performing pupils. This implies that pupils regularly use communications to develop their cognitive ability. Interacting and enjoying with people results in high academic performance and they learn best with these kinds of activities.

The implications of this study suggest that teachers' role is not just to provide information for the learners but must also assist learners on how to learn.

Finally, it has been said that there is no one-fits-all solution for teaching and learning. By using cognitive strategies and learning styles, teachers can treat each learner as individuals and provide some direction for those who are struggling to boost their academic performance.

Recommendations

Based on the conclusions of this study, the following recommendations are made:

Teachers should offer impartial and extensive knowledge of a wide range of possible strategies, which learners should selectively learn to use, depending on

their preferences and style. Teachers should identify the learning-style preferences of the pupils so that the selection of appropriate instructional methods and materials could maximize pupils' learning.

Teachers should consider matching their teaching strategies to the student's learning styles. Teachers' identification of their own style preferences may facilitate students' learning by more closely matching student preferences with teacher's practices. Teachers should initiate activities that can encourage the pupils to develop their own cognitive strategies such as determining goals, remembering, looking for assistance, organizing and self- appraisal.

Pupils should be aware of their learning-style to allow them to learn in the manner most productive to them and thus increase their academic performance.

Curriculum developers and material producers should work in consultation with teachers and students so as to design a better program, appropriate materials and tasks fit for more effective learning.

Future researchers could conduct a study on cognitive strategies and learning styles among high school or college students. They could examine if these constructs vary among different year levels. This could contribute to the literature of these constructs.

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