

# Science Teachers' Teaching Styles, Students' Learning Styles and Their Academic Performance

Kristine Joy C. Manalo, Ed. D

Assistant Professor, General Education, Philippine Merchant Marine Academy, Iba Zambales, Philippines 2201

---

**Abstract:** This study aimed to find out the correlations of Science teachers' teaching styles and students' learning styles with their academic performance among the secondary schools in the Zone 2 Division of Zambales for Academic Year 2010-2011. The descriptive-survey method adapted standardized test of Grasha-Reichmann teaching style survey and the VAK model learning styles standardized tool. Fifty five (55) Science teachers and two thousand ninety five (2,095) students were used as samples. Majority of the Science teacher-respondents were young adults, female, married, finished Bachelor's Degree, specialized in Science and have been teaching for more than 10 years. The student-respondents were in normal school age, female and belonged to First Year Level; majority of the Science teacher-respondents were considered Expert as teaching style and only few were categorized as Facilitator, Delegator and Personal Model; most of the student-respondents were classified as visual learners; some were auditory learners and few were kinesthetic learners; the academic performance of student-respondents in Science subject was described as passing but not satisfactory. There were significant variations in the academic performance of students when grouped according to gender and year level; and a positive low correlation between the Science teachers' teaching styles and the students' learning style; moderate positive correlation between Science teachers' teaching styles and the academic performance of students and a positive high correlation between the students' learning styles and their academic performance in the Science subject with a computed r-value of 0.82. All values computed are significant at 0.05 level of significance.

**Keywords:** Academic Performance, High School, Learning Styles, Science Teachers, Teaching Styles, Zambales.

---

## I. INTRODUCTION

The search for being an effective and efficient teacher is continuously on progress<sup>16</sup>. An effective teacher is one who runs an effective classroom, and touches the lives of children. An efficient teacher is one who knows what they are doing and does the right thing consistently. Defining a teacher is really hard. Many studies have been conducted to define scientifically to distinguish the characteristics of a teacher; a common criterion has not yet established<sup>11</sup>. However two general points may be grouped in professional qualities and personal qualities. Understanding the learners second vital in professional qualities is what a teacher should possess. He must know how much children at various levels of maturity are capable of understanding. It is not enough, yet for a teacher to know the characteristics of children, equally important is that he must be like them.

The Teacher is like an oil lamp – if its flame is steady and bright a hundred lamps can be lit by it, without in any way diminishing its brightness. For ensuring the brightness of the lamp, it is necessary that the wick be in good order and the oil supply be sufficient. Certainly the role of the teacher cannot be written in mere words. The role of the teacher is of great importance and is examined on a daily basis by his/her charges. We must always keep the “flame” alight and the lamp always fueled.

Instructors employ a teaching style based on their beliefs about what constitutes good teaching, personal preferences, their abilities, and the norms of their particular discipline. Some believe classes should be teacher-centered, where the teacher is expert and authority in presenting information. Others take a learner-centered approach, viewing their role as more of a facilitator of student learning<sup>18</sup>.

Is learning a product or process? Teaching is not just telling and learning is not just listening. There are extreme differences in how people process information and learn. Student-centered teachers create learning environments which encourage learners to examine their current beliefs, enable them to explore and be exposed to new ways of thinking, and include experiences which require them to re-formulate their understanding<sup>15</sup>.

Instructors and designers of learning experiences should have an awareness of the diversity of learning styles which allow them to include features that appeal to different kinds of learners and help students get the most out of their learning experience. The different learning styles areas are active, reflective, sensing, intuitive, visual, verbal and global. Another way to look at learning styles is to consider the more physical approach on students may take to learning. The V-A-K Learning Styles: visual, auditory and kinaesthetic.<sup>8</sup>

In concern with learning styles, most instructors utilize a variety of teaching styles, but they have a tendency to gravitate towards one or two styles more than the other ones. Teaching styles may change when one teaches different courses. In this study, the Grasha-Riechmann Teaching Style-five predominant teacher styles: delegator, facilitator, personal model/demonstrator, formal authority and expert correlates to V-A-K Learners performance.

It is good to strive for a balance of styles in teaching. However, there may be times when one style is better suited to a particular course than the others. "Research supports the concept that most teachers teach the way they learn"<sup>18</sup>. Since a great many teachers have experienced academic success in learning environments that were instructor centered and relied heavily on lecture, it is understandable that their preferred style of teaching, at least initially, would be to repeat "what worked with them." Typically these teachers are field independent, that is, they are more content oriented and prefer to use more formal teaching methods, favoring less student involvement and more structured class activities<sup>6</sup>. This style works especially well for field-dependent students who want to be told what they should learn and given the resources to acquire the specified body of knowledge or skills. This may be why most training is provided through instructor-led classrooms in the corporate environment<sup>2</sup>. This strategy can be effective when employees are highly motivated to learn specific content that is relevant to their careers. However, instructor-centered training is not as effective when training involves context—the "physical, emotional, and intellectual environment that surrounds an experience and gives it meaning" Classroom teachers who are skilled in learning principles and have experience with theories about student-centered learning and constructivism are more likely to adopt student-centered instruction<sup>19</sup>, even if it is not the way they learned or prefer to learn. These teachers have broad views of how teaching can occur and strong beliefs about the need to engage learners in the learning process. They are aware of the changing demographics of classrooms and the influence of technology on students' ways of learning<sup>19</sup>. They are more likely to substitute self-directed learning opportunities and inter-active learning environments for the traditional lecture and make use of "varied resources to create personally meaningful educational experiences"<sup>4</sup>.

To make this determination, consider whether the teachers teaching style allows students to achieve the course objectives. The question now for the teachers: Does teacher's teaching style aid a specific type of learners in achieving the course objectives and thus enhance their learning based on their learning styles? Does the overall academic performance of students correlate with their learning styles?<sup>24</sup>

These questions motivated the researcher to pursue this study in order to improve the students' academic performance.

## II. THEORETICAL FRAMEWORK

This study is anchored on the idea that academic performance of students is affected by many factors such as personal factors, school factors and teacher factors, among others.

### A. Framework of the Study:

The Visual-Auditory-Kinesthetic (VAK) theory was used as a basis for describing the learning styles of students. It provides a different perspective for understanding and explaining a person's preferred or dominant thinking and learning style, and strengths. According to this theory, everyone perceives the world through the five senses. However, different

people rely on each of the senses to varying degrees. They usually have a preference for one or more of the modalities, (mainly auditory, visual, and tactual / kinesthetic) but can function using others when necessary. The preferred modes of perception compose our learning styles. Traditional school activities, arranged by grade, are based on the concept of a "normal" sequence in the development of learning styles. Those whose styles develop in this pattern usually succeed in school. Those who follow a different pattern, or who have an extremely strong preference for one modality at the expense of others, usually have a more difficult time adjusting to traditional education.

Grasha-Reichmann Teaching Style Model was also used as basis for categorizing teachers based on how they execute their lesson and learning activities inside the classroom. These teaching styles and/or roles include: as Expert, as Formal Authority, as Personal Model, as Facilitator and as Delegator.

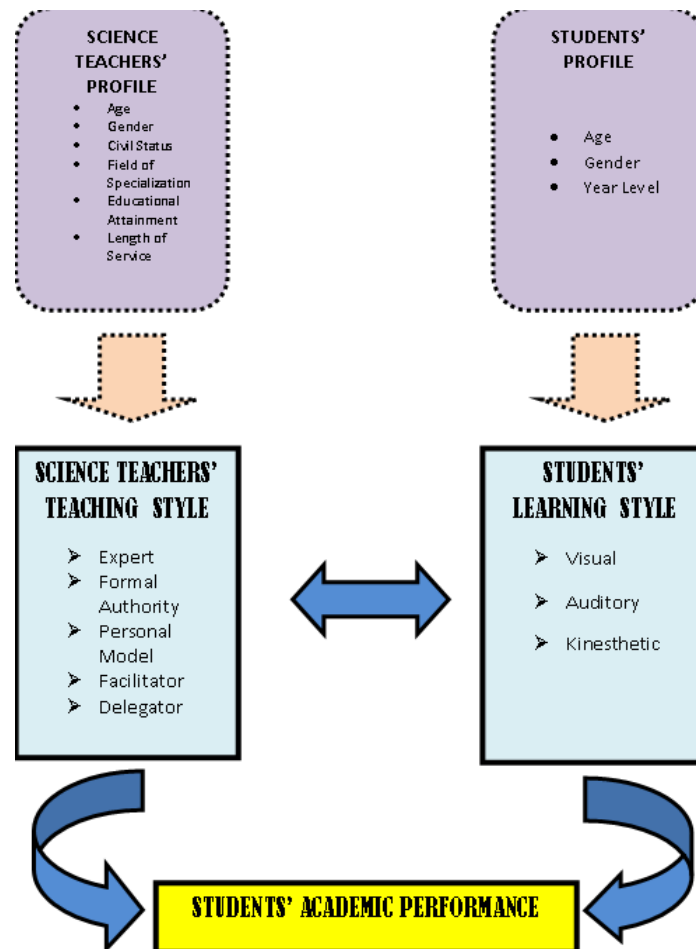


Figure 1 presents the framework of the study. It shows how student's academic performance correlates with teacher's teaching style and his own learning style. The teacher's teaching style should match and be in line with the student's learning style. Pre-requisite to this is that the teacher must know and understand fully his learners and their learning modalities. The profile of both respondents may serve as factors affecting their teaching and learning styles.

### B. Statement Of The Problem:

Specifically, this study aims to answer the following questions.

1. What is the profile of the:

1.1 teacher- respondents in terms of:

1.1.1 age;

1.1.2 gender;

1.1.3 civil status;

- 1.1.4 educational attainment;
- 1.1.5 field of specialization; and
- 1.1.6 length of service?
- 1.2 student-respondents in terms of:
  - 1.2.1 age;
  - 1.2.2 gender; and
  - 1.2.3 year level?
2. How are the teaching styles of the science teachers be described as:
  - 2.1 Expert;
  - 2.2 Formal Authority;
  - 2.3 Personal Model;
  - 2.4 Facilitator; and
  - 2.4 Delegator?
3. How are the learning styles of the student-respondents be described as to:
  - 3.1 visual learners;
  - 3.2 auditory learners; and
  - 3.3 kinesthetic learners?
4. What is the Performance Level in Science among the public high school students of Zone II, Division of Zambales?
5. Is there a significant variation in the performance level of the student-respondents in Science when grouped according to their profile variables?
6. Is there a significant relationship between the Science teachers' teaching style and students' learning style with their academic performance?

***Null Hypothesis:***

The following null hypotheses were tested in this study:

1. There is no significant variation in the performance level of the student-respondents in Science when grouped according to their age, gender and year level?
2. There is no significant relationship between the Science teachers' teaching style and students' learning style and academic performance?

### **III. RESEARCH METHODOLOGY**

The research method will be used in the study is descriptive method through correlational survey technique. This method involves the collection of data in order to test hypothesis or to answer questions concerning the current status of the subject of the study<sup>17</sup>. It determines and reports the way things are<sup>21</sup>.

The purpose of the descriptive type of research is to observe, describe, and explore aspects of a situation. It is also design to obtain information regarding the prevalence, distribution and interrelationship of variables within a population<sup>14</sup>.

***The Respondents:***

The respondents of the study were the fifty five (55) Science teachers and two thousand ninety five (2,095) students of the public secondary schools in Zone 2 Division of Zambales. For teacher-respondents, they represent the total population of public secondary teachers in Zone 2 Division of Zambales who teaches Science. The student-respondents, on the other

hand were selected randomly from each school. The teachers were all full-time and regular while the students were officially enrolled during the School Year 2010-2011. They came from eleven (11) schools, namely: Rofulo Landa National High School, Salaza High School Annex, Amungan National High School, Jesus Magsaysay High School, Zambales National High School, Beneg National High School, Botolan National High School, Taugtug National High School, Loob Bunga National High School, Baquilan Resettlement High School and Panan National High School. High percentage of respondents came from the central school, the Zambales National High School. Table 1 presents the distribution of respondents per school.

**TABLE 1 Frequency Distribution of the Subject of the Study**

School	Teacher Respondents		Student Respondents	
	Total	%	Total	%
Amungan NHS	5	9.09	208	9.93
Baquilan Resettlement HS	2	3.64	155	7.40
Beneg NHS	2	3.64	148	7.06
Botolan NHS	8	14.54	224	10.69
Jesus Magsaysay HS	4	7.27	196	9.36
Loob Bunga NHS	2	3.64	148	7.06
Panan NHS	2	3.64	132	6.30
Rofulo Landa NHS	6	10.91	217	10.36
Taugtog NHS	4	7.27	211	10.07
Zambales NHS	16	29.09	244	11.65
<b>TOTAL</b>	<b>55</b>	<b>100</b>	<b>2095</b>	<b>100</b>

#### **A. Teacher-Respondent:**

Majority of the respondents age forty and below; fifteen (15) or 27.27 percent belonged to age bracket 31 – 35, and twelve (12) or 21.82 percent belonged to age bracket 26 – 30. Only two (2) or 3.64 percent are near the optional retirement age of 60. The computed mean age is 37.38 years old. This is considered to be young adult or mid-life stage based on psychologists.

At this age, the person is assuming matured roles in his family and in the society. He is ready to accept greater challenges and responsibilities. His ideals, dreams and goals start to be clarified and refined at this stage; he becomes task and goal-oriented; he becomes more serious in his career/profession; and he wants to pursue higher position in the organization he belongs in; and he seeks promotion, more achievement and recognition as part of his fulfillment<sup>1</sup>.

Forty three (43) or 78.18% are female and twelve (12) or 21.82 percent are male. This shows that teaching is a female-dominated profession. This is based on the premise that women have the ability to show more care, patience and understanding among children compared to men. They even bring with them their sense of being a mother even within the ambit of their profession. Their motherly instinct gives them the chance to excel in the teaching profession.

Forty eight (48) out of fifty five (55) are married and seven (7) or 12.73 percent are single. All male respondents are married. The claim that most teachers are married to their profession and that there is a high possibility for them to remain single are not verified using the results of this study. Teachers who are married tend to be less dedicated to their job and apprehensive of doing additional tasks assigned to them because their priority is their job<sup>3</sup>. Some male teachers even resigned to the teaching job to apply for a “greener Pasture” in order to support family’s growing needs and demands.

The educational attainment of Science teachers in Zone 2, Division of Zambales, thirty four (34) or 61.82 percent finished Baccalaureate Degree with MA units; thirteen (13) or 23.64 percent only finished Baccalaureate Degree; six (6) or 10.91 percent finished their Master’s Degree and only two (2) or 3.63 percent with Doctoral units. It is sad to say that there are no Science teachers who finished Doctorate Degree.

**TABLE 2 Distribution of Science Teacher-Respondents According to Field of Specialization**

<b>Field of Specialization</b>	<b>f</b>	<b>%</b>
General Science	11	20.00
Biology	5	9.09
Chemistry	13	23.64
Physics	4	7.27
Mathematics	13	23.64
Technology and Livelihood Education	8	14.54
Filipino	1	1.82
<b>TOTAL</b>	<b>55</b>	<b>100</b>

Studies and other researchers reveal that teachers who grow professionally to their profession through graduate studies tend to be more effective in his teaching<sup>1</sup>. Those who attend graduate schooling have greater chance of promotion; exhibit greater skills in teaching; show better mastery of their subject matter; provide better understanding of the teaching profession, the learners and the teaching-learning process. But the result of this study implies that teacher development program should focus on motivating and giving assistance to these teachers to finish their graduate studies up to the Doctoral level, because quality instruction reflects those qualities previously mentioned.

Majority of the teachers are really graduates or finished courses in Science. Thirteen (13) or 23.64 percent major in Chemistry, eleven (11) or 20 percent in General Science, five (5) or 9.09 percent in Biology and four (4) or 7.27 percent in Physics.

It is sad to note that there are those who are teaching Science but not graduates of Science nor its allied field. There are thirteen (13) or 23.64 who are major in Mathematics, eight (8) or 14.54 in Technology and Livelihood Education, and one (1) or 1.82 percent finished Filipino as his specialization.

According to the Principle of Individual Effectiveness, a person should be given work load or assignment within the person's line of specialization and ability to ensure a high level of effectiveness<sup>5</sup>. Teacher could not effectively deliver his subject matter if he lacks knowledge and mastery of it. As saying goes, "You could not give what you do not have." And "How could a blind man lead another blind man?" Teacher, to fully enjoy his profession must love what he is doing. Teaching subjects outside his line of specialization would be less motivated to teach. Furthermore, learning the subject matter which is not familiar to a teacher, requires time and more effort for him to prepare his lesson; thus, reducing his efficiency.

Based on their length of service as teachers, eleven (11) or 20 percent have been in the service for 11- 25 years; ten (10) or 18.18 percent served for less than five years; and ten of them also have been teaching for more than 31 years.

Majority of them or 65.50 percent have been in the teaching service for more than ten years. This result indicates that majority the Science teacher-respondents are not new in their job. This connotes that they already gained the right experience in teaching and they enjoy their job because they did not leave their profession in their first years of teaching. It is a common observation that teachers who stayed long in service showed deeper commitment in their job and deeper concern for the learners.

### ***B. Student-Respondent:***

In the age distribution of student-respondents of this research from Zone 2, Division of Zambales. More than half of the respondents or 60.62 percent belongs to age bracket 12 -14; 38.71 percent in the age bracket of 15 – 17; and only fourteen (14) or 0.67 percent belongs to age bracket 18 – 20.

The computed mean age is 14.20. This is a normal school age of students in the second or third year level. The respondents are in their adolescent period characterized by having sense of adventure, desire for exploration, curious mind, identity searching, peer attachment and group formation. These characteristics should be incorporated in the design of teaching activities. (Encyclopedia of School Psychology, 2008)

Majority of the student-respondents of 60.19 percent are female and 39.81 percent are male. Majority of students in rural schools are female<sup>9</sup>. She further explained that drop-out rate among boys is higher because they help their fathers in doing works at the farm and other household chores. Parents in the rural areas show deeper concern in the education of female children compared to male.

Six hundred twenty six (626) or 29.88 percent are in the first year level; six hundred (600) or 28.64 percent are in the third year level; five hundred forty (540) or 25.78 percent are in the fourth year level; and three hundred twenty nine or 15.70 percent are in the second year level. Science subject is included in every year level to advance scientific literary among students. Scientific knowledge, scientific processes and skills and scientific attitudes are being developed and acquired by students in studying Science at all level.

### C. Teaching Styles of Teacher-Respondent:

TABLE 3 Teaching Styles of Science Teacher-Respondents

Teacher-Respondent	TEACHING STYLES									
	Expert		Formal Authority		Personal Model		Facilitator		Delegator	
	X	I	X	I	X	I	S	I	S	I
1	4.13	High	4.00	High	3.50	High	3.27	Moderate	3.75	High
2	4.00	High	4.00	High	3.63	High	4.25	Very High	3.75	High
3	4.00	High	4.00	High	3.38	Moderate	4.25	Very High	3.75	High
4	4.00	High	4.38	Very High	3.38	Moderate	4.15	High	3.88	High
5	4.13	High	4.00	High	3.50	High	3.27	Moderate	3.75	High
6	4.00	High	4.50	Very High	3.37	Moderate	4.38	Very High	4.13	High
7	4.00	High	4.50	Very High	3.38	Moderate	4.68	Very High	4.13	High
8	4.13	High	4.00	High	3.50	High	3.27	Moderate	3.75	High
9	4.25	Very High	4.50	Very High	3.25	Moderate	4.25	Very High	4.13	High
10	4.25	Very High	4.15	High	3.25	Moderate	3.00	Moderate	3.88	High
11	4.38	Very High	4.50	Very High	3.38	Moderate	3.38	Moderate	3.88	High
12	4.13	High	4.00	High	3.50	High	3.37	Moderate	3.75	High
13	4.38	Very High	4.50	Very High	3.38	Moderate	3.37	Moderate	3.88	High
14	4.38	Very High	4.63	Very High	3.25	Moderate	3.37	Moderate	3.75	High
15	4.10	High	4.13	High	3.50	High	3.37	Moderate	3.75	High
16	4.13	High	4.00	High	3.50	High	3.37	Moderate	3.75	High
17	4.38	Very High	4.63	Very High	3.88	High	3.28	Moderate	4.00	High
18	4.25	Very High	4.50	Very High	4.13	High	3.28	Moderate	3.88	High
19	4.00	High	4.10	High	3.63	High	3.28	Moderate	3.75	High
20	4.13	High	4.00	High	3.50	High	3.37	Moderate	3.75	High
21	4.38	Very High	4.25	Very High	4.13	High	3.15	Moderate	3.88	High
22	4.00	High	4.00	High	4.23	Very High	3.28	Moderate	3.75	High
23	4.13	High	4.00	High	3.50	High	3.27	Moderate	3.75	High
24	4.00	High	4.00	High	4.43	Very High	3.28	Moderate	3.75	High
25	4.38	Very High	4.00	High	4.13	High	3.00	Moderate	3.63	High
26	4.13	High	4.00	High	3.50	High	3.27	Moderate	3.75	High
27	4.38	Very High	4.00	High	4.13	High	3.23	Moderate	3.50	High
28	4.13	High	4.00	High	3.50	High	3.87	High	4.15	High
29	4.00	High	4.10	High	3.63	High	3.28	Moderate	3.75	High
30	4.50	Very High	4.00	High	4.38	High	3.28	Moderate	3.63	High
31	4.50	Very High	3.88	High	4.38	High	3.28	Moderate	3.63	High
32	4.13	High	4.00	High	3.50	High	3.87	High	3.75	High
33	4.13	High	4.00	High	3.50	High	3.27	Moderate	3.75	High
34	4.38	Very High	4.13	High	4.13	High	3.28	Moderate	3.75	High
35	4.38	Very High	4.50	Very High	3.38	Moderate	3.28	Moderate	3.88	High
36	4.38	Very High	4.63	Very High	3.25	Moderate	3.28	Moderate	3.75	High
37	4.13	High	4.00	High	3.50	High	3.27	Moderate	4.15	High
38	4.13	High	4.00	High	3.50	High	4.17	High	3.75	High
39	4.13	High	4.00	High	3.50	High	3.27	Moderate	3.75	High
40	4.38	Very High	3.88	High	4.13	High	3.27	Moderate	3.75	High
41	4.38	Very High	3.88	High	4.13	High	3.27	Moderate	3.75	High
42	4.38	Very High	4.13	High	4.13	High	3.28	Moderate	3.75	High
43	4.13	High	4.00	High	3.50	High	4.17	High	3.75	High
44	4.38	Very High	4.13	High	4.13	High	3.17	Moderate	3.75	High
45	4.38	Very High	4.13	High	4.13	High	3.18	Moderate	3.75	High
46	4.13	High	4.00	High	3.50	High	3.17	Moderate	3.75	High
47	4.13	High	4.13	High	4.13	High	3.27	Moderate	4.15	High
48	4.13	High	4.00	High	3.50	High	3.37	Moderate	3.75	High
49	4.38	Very High	4.13	High	4.13	High	3.38	Moderate	3.75	High
50	4.13	High	4.15	High	3.50	High	3.17	Moderate	3.75	High
51	4.13	High	4.00	High	3.50	High	3.27	Moderate	3.75	High
52	4.38	Very High	4.13	High	4.13	High	3.18	Moderate	3.75	High
53	4.38	Very High	4.13	High	4.13	High	3.18	Moderate	3.75	High
54	4.38	Very High	4.13	High	4.13	High	3.28	Moderate	3.75	High
55	4.38	Very High	4.13	High	4.13	High	3.28	Moderate	3.75	High
Overall X	4.22	Very High	4.14	High	3.73	High	3.44	Moderate	3.80	High
Frequency	31		14		2		5		3	
%	56.36		25.45		3.64		9.09		5.45	

Table 3 presents the teaching styles of Science teacher-respondents when described as expert, formal authority, personal model, facilitator and delegator.

It shows in the table that thirty one (31) or 56.36 percent of the Science teacher-respondents are categorized to have a teaching style of an Expert. They obtained the highest mean in this category, thus being Expert is their dominating teaching style. Fourteen (14) or 25.45 percent can be classified as having Formal Authority as their teaching style; five (5) or 9.09 percent have a dominating teaching style of being Facilitator; three (3) or 5.45 percent have a dominating teaching style of being Delegator; and only two (2) or 3.64 percent have a dominating teaching style of being Personal Model or Demonstrator.

In addition, the computed overall mean for each teaching style is 4.22 with a descriptive rating of "Very High" for Expert; a mean of 4.14 with a descriptive rating of "High" for Formal Authority; a mean of 3.80 with a descriptive rating of "High" for Delegator; a mean of 3.73 with a descriptive rating of "High" for Personal Model; and a mean of 3.44 with a descriptive rating of "Moderate" for Facilitator.

Expert possesses knowledge and expertise that students need. Strives to maintain status as an expert among students by displaying detailed knowledge and by challenging students to enhance their competence. Concerned with transmitting information and insuring that students are well prepared. Its advantage is the information, knowledge, and skills such individuals possess but if overused, the display of knowledge can be intimidating to less experienced students. May not always show the underlying thought processes that produced answers.

Formal Authority possesses status among students because of knowledge and role as a faculty member. Concerned with providing positive and negative feedback, establishing learning goals, expectations, and rules of conduct for students. Concerned with the correct, acceptable, and standard ways to do things and with providing students with the structure they need to learn. Its benefits focus on clear expectations and acceptable ways of doing things. A strong investment in this style can lead to rigid, standardized, and less flexible ways of managing students and their concerns.

Facilitator emphasizes the personal nature of teacher-student interactions. Guides and directs students by asking questions, exploring options, suggesting alternatives, and encouraging them to develop criteria to make informed choices. Overall goal is to develop in students the capacity for independent action, initiative, and responsibility. Works with students on projects in a consultative fashion and tries to provide as much support and encouragement as possible. The personal flexibility, the focus on students' needs and goals, and the willingness to explore options and alternative courses of action. Its disadvantage as style is often time consuming and is sometimes employed in a positive and affirming manner.

Personal Model believes in "teaching by personal example" and establishes a prototype for how to think and behave. Oversees, guides, and directs by showing how to do things, and encouraging students to observe and then to emulate the instructor's approach. An emphasis on direct observation and following a role model. Some teachers may believe their approach is the best way leading some students to feel inadequate if they cannot live up to such expectations and standards..

Delegator concerned with developing students' capacity to function in an autonomous fashion. Students work independently on projects or as part of autonomous teams. The teacher is available at the request of students as a resource person. Helps students to perceive themselves as independent learners. May misread student's readiness for independent work. Some students may become anxious when given autonomy.

The need to match teaching styles with learning styles becomes quite important when learning task is difficult<sup>7</sup>. Teachers should vary their teaching methods) in order that the students will not be bored and lose interest on the subject matter.

#### ***D. Learning Styles of Student-Respondent:***

**TABLE 4 Learning Styles of Students Based on VAK Model**

<b>Learning Styles</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Visual	858	40.95
Auditory	760	36.28
Kinesthetic	477	22.77
<b>TOTAL</b>	<b>2,095</b>	<b>100.00</b>



Table 4 presents the number of students being classified as visual learners, auditory learners and kinesthetic learners. Majority, 858 students or 40.95 percent are being classified as visual learners, 760 students or 36.28 percent are auditory learners and 477 students or 22.77 percent are classified as kinesthetic learners.

Visual learners read the instructions first, look for map for directions, follows a written recipe, write instructions, watch how to do it, in free time goes to museums and galleries, imagine what they would look like on clothes, read lots of brochures, read reviews in newspapers and magazines, watching what the teacher is doing, imagine what the food will look like, focus on the words or the pictures in front of me, choose colors and how they look, first memory in looking at something, visualize the worst-case scenarios, connected to people in how they look, write lots of revision in notes and diagrams, show them what it mean, easiest to remember in faces, love watching films photography and television, arrange a face to face meeting, notice people on looks and dress, keep replaying in mind what upset them, know someone is lying if they avoid looking them and tend to say "I see what you mean".

Auditory learners listen to an explanation, ask for spoken directions, call a friend for an explanation in cooking a new dish, tend to say listen to me and explain, enjoy listening to music and talking to friends, talking through with the teacher exactly what supposed to do, discuss the problem and the possible solutions in head, first memory to how it spoke, talk over on notes, alone or with other people when exam, explain to them in different ways until they understand, easiest to remember in names and tend to say "I hear what you are saying".

Kinesthetic or Tactile learners go ahead and figure I out the new equipment, follow instincts, do it by themselves, try clothes when shopping, imagine making movement or creating the formula, encourage them to try and talk through idea as they do it, doing physical activity, can't sit still and move around constantly moving in time with the music, easiest to remember how things done, imagine what the food will taste like and tend to say: "I know how you feel"<sup>24</sup>.

The findings reveal that individuals have different modalities in learning. One learning activity that is best for one may not be good to somebody else. This speaks of learners' individual differences. It provides a different perspective for understanding and explaining a person's preferred or dominant thinking and learning style, and strengths.

Teachers must recognize the fact that each learner learns differently. Therefore, variations in the activities, approaches and strategies for teaching must also vary to suit to all learners. For students to really enjoy the classroom activities, it must be suited to his needs and interest<sup>9</sup>.

#### ***E. Performance Level of Student-Respondents in Science Subject***

**TABLE 5 Performance of Student-Respondents**

Grade Bracket	Year Level				Total F	%
	First Year	Second Year	Third Year	Fourth Year		
90 – 94	82	5	8	12	107	5.11
85 – 89	428	12	41	10	491	23.44
80 – 84	33	67	67	198	365	17.42
75 – 79	78	227	463	302	1070	51.07
70 – 74	5	18	21	18	62	2.96
<b>Total f</b>	<b>626</b>	<b>329</b>	<b>600</b>	<b>540</b>	<b>2,095</b>	<b>100.00</b>
<b>Mean</b>	<b>86.03</b>	<b>78.34</b>	<b>78.27</b>	<b>79.19</b>		
<b>Overall Mean Performance</b>	<b>79.94</b>					

The performance level of student-respondents in Science for the first grading period is reflected in Table 5. It shows that the mean grade of the first year students is 86.03; the second year students have a mean grade of 78.34; the third year students have a mean grade of 78.27; and the fourth year students have a mean grade of 79.19.

The overall mean grade of the student-respondents during the first grading period is 79.94. This is not a satisfactory grade, though it is passing.

The level of performance reflects the overall performance of a student in class. It serves as his measure of cognitive, affective and psychomotor abilities. Grade also reflects one's gauge to do advance activities and learning<sup>12</sup>.

The result on grades implies that students in Zone 2 Division of Iba performed unsatisfactory in Science and therefore need much attention among education authorities and educators. Factors that could help in increasing their academic grades should be look into and address problems related to it. This low performance may indicate poor scientific literacy among students which is important for the nation's progress.

#### ***F. Variations in the Performance Level when Grouped According to Age, Gender and Year Level:***

**TABLE 6 ANOVA TABLE for the Variations in the Performance Level when Grouped According to Age, Gender and Year Level**

Variable		Sum of Squares	Df	Mean Square	F	Sig.	Decision
Age	Between Groups	3.623	3	1.21	1.28	0.357	Accept Ho (Not Significant)
	Within Groups	1976.56	2093	0.94			
	Total	1980.83	2094				
Gender	Between Groups	5.267	1	5.267	5.37	0.03	Reject Ho (Significant)
	Within Groups	2058.752	2093	0.98			
	Total	2064.02	2094				
Year Level	Between Groups	2.965	3	0.99	3.32	0.006	Reject Ho (Significant)
	Within Groups	625.363	2093	0.298			
	Total	126.229	2094				

The findings to test for the variations using Analysis of Variance (ANOVA) in the performance level of students when grouped according to their age, gender and year level are being presented in Table 6.

For age, the computed F-value is 1.28 which is not significant within 0.05 level. Therefore, the null hypothesis is accepted. There is no significant variation in performance level when grouped according to age because the students almost belong to the same age group of adolescent, the age may not be a determinant for one to say that it affects the performance level of students.

For gender and year level, the computed F-values are 5.37 and 3.32, respectively; and both values are significant at 0.05 level. The null hypothesis is rejected. Therefore, there are significant variations in the performance level of students when grouped according to gender since most of the respondents were female and the grade of First Year is relatively higher compared to the other year level which may be considered as factors affecting the performance of students.

#### ***F. Correlations of Science Teachers' Teaching Styles, Students' Learning Styles and Performance Level in Science:***

It can be gleaned from Table 7 that there is a positive low correlation between the Science teachers' teaching styles and the students' learning style with an r-value of 0.34. On the other hand, there is a moderate positive correlation between Science teachers' teaching styles and the performance level of students with an r-value of 0.67. Furthermore, there is a positive high correlation between the students' learning styles and their performance level in the Science subject with a computed r-value of 0.82. All values computed are significant at 0.05 level of significance.

**TABLE 7 Correlations of Science Teachers' Teaching Styles, Students' Learning Styles And Performance Level in Science**

Variables	r-Value	Significance*	Description
Science Teachers' Teaching Styles and Students' Learning Styles	<b>0.34</b>	0.03	<i>Low Positive Correlation</i>
Science Teachers' Teaching Styles and Performance Level in Science	<b>0.67</b>	0.00	<i>Moderate Positive Correlation</i>
Students' Learning Styles and Performance Level in Science	<b>0.82</b>	0.01	<i>High Positive Correlation</i>
* All values are significant at 0.05 level			

Students preferred learning styles matched the instructors' preferred teaching styles received higher course grades than those who did not match<sup>23</sup>. Furthermore, when students' learning preferences match their instructor's teaching styles, student motivation and achievement usually improve<sup>13 19</sup>.

The findings reveal that there is a moderate correlation between Science teachers' teaching styles with students' performance level in the subject; and a high correlation between the students' learning styles and their academic performance. It is interesting to note that both the teaching styles and learning styles contribute to the overall performance of students. But it this performance could be improved if the teaching styles of teachers match the learning styles of students. The below average performance of students in their Science subject may be attributed on this factor since there is a low correlation between the two styles as shown in the findings.

### G. Teaching Styles and Learning Styles:

These are the findings found in the study in matching teaching styles to learning styles.

TEACHER Student	EXPERT	FORMAL AUTHORITY	PERSONAL MODEL	FACILITATOR	DELEGATOR
Visual	MATCH	Near Match	MATCH		
Auditory	Near Match	MATCH		Near Match	Near Match
Kinesthetic			Near Match	MATCH	MATCH

### III. CONCLUSION

Based on the findings: Science teachers were young adults, female, married, finished Bachelor's Degree, specialized in Science and have been teaching for more than 10 years while student-respondents were in their normal school age; majority were female and high number belonged to First Year Level; Science teacher-respondents were considered Expert; Most of the student-respondents were classified as visual learners; academic performance of student in Science subject described as passing but not satisfactory; There were significant variations in the academic performance of students when grouped according to gender and year level; a positive low correlation between the Science teachers' teaching styles and the students' learning style; moderate positive correlation between teaching styles and the academic performance of students and positive high correlation between the learning styles and their academic performance in the Science subject.

It is recommended the science teachers who have not finished their Master's pursue graduate studies in line of their field of specialization should enroll additional units in Science and may be sent for further trainings and seminars to effectively teach the subject, assess their strengths and weaknesses in teaching and must vary their teaching styles for effective delivery of lesson, and strengthen their style as facilitator of learning, delegator of tasks to students and as a personal model for children to emulate. Students may be provided with variety of classroom activities catering all their perceptive strengths and strengthening their capabilities. A Science teacher understands their learners and provides learning experience that addresses the needs of visual learners, auditory learners and kinesthetic learners. Improve the academic performance of students by assessing the different factors affecting it. Teachers and administrators may provide a programs and activities that will motivate students to study better. Classroom activities are not to be gender biased and curriculum of Science for every year level may be reviewed as to its implementation. Activities are to be within the year level of the students and the desired learning competencies are to be met. The teaching styles of teachers are to be match the learning style of students since both contributes to the academic performance of students.

### REFERENCES

- [1] Bueno, David C. (2010). Human Asset Management Practices in Columban College As Perceived by College Instructors. (A Faculty Research: Columban College, Olongapo City

- [2] Caudron, Shari . “Learners Speak Out. What Actual Learners Actually Think of Actual Training. Training and Development 54, no. 4 (April 2000): 52-57.
- [3] Dizon, Marie Fe C. (2005). Teaching Competencies of Social Studies Teachers in Selected Public High Schools of Zambales, Ramon Magsaysay Technological University, Iba
- [4] Glenn, J.M. (2000).“Teaching the Net Generation.” Business Education Forum 54, no 3 February: 6-8,10, 12
- [5] Gutierrez, L.M. (1990). Working with women of color: An empowerment perspective. Oxford University Press
- [6] Hayes, John., and Allinson, Christopher. W. “Learning Styles and Training and Development in Work Settings: Lessons from Educational Research.” Educational Psychology 17, nos. 1-2 (March-June 1997): 185-193.
- [7] Hebron, Yolie A. (2009). Teaching Strategies and Learning Styles in English among Third Year High School Students in Candelaria School of Fisheries: Its Implications to Academic Performance. Ramon Magsaysay Technological University , Iba
- [8] Identify your Learning Style, Kinesthetic, Visual and Auditory are Different Ways to Learn. Retrieved August 28, 2009 from [http:// studyskills.suite101.com/article.efm/learning\\_styles](http://studyskills.suite101.com/article.efm/learning_styles)
- [9] Ignacio, Helen (2010). Factors Affecting the Academic Performance in Science of Grade VI Pupils of San Guillermo Elementary School, San Marcelino, Zambales. (Master’s Thesis: Columban College, Olongapo City)
- [10] Investigating Critical & Contemporary Issues in Education/ Student Academic Performance. Retrieved October 19, 2009 from [http://en.wikibooks.org/wiki/Investigating\\_Critical%26\\_Contemporary\\_Issues\\_in\\_Education/Student\\_Academic\\_Performance](http://en.wikibooks.org/wiki/Investigating_Critical%26_Contemporary_Issues_in_Education/Student_Academic_Performance)
- [11] Lardizabal, Amparo S. et al (2002). Principles and Methods of Teaching , 927 Quezon Avenue QC: Phoenix House
- [12] Matriano, Eric (2010). Expected and Actual Teaching Competencies of Graduating Education Students of Columban College.: Basis for Effective Pre-Service Training Program. (A Faculty Research, Columban College, Olongapo City)
- [13] Miller, P. “Learning Styles: The Multimedia of the Mind. Research Report.” 2001. (ED 451 140)
- [14] Polit, D., Hungler, B. Nursing research: Principles and methods. 5th ed. Lippincott, Norwalk, CT; 1995.
- [15] Newsam. Peter. “Teaching and Learning”. Microsoft ® Encarta ® 2007. © 1993-2006 Microsoft Corporation.
- [16] Salandanan, G. (2006) “Methods of Teaching”. Metro Manila. Loriman Publishing Inc.
- [17] Sevilla, et al. (1999) Research Methods. Manila: Rex Book Store
- [18] Spoon, J. C., and Schell, J. W. “Aligning Student Learning Styles with Instructor Teaching Styles.” Journal of Industrial Teacher Education 35, no. 2 (Winter 1998): 41-56.
- [19] Stitt-Gohdes, W. L. “Business Education Students’ Preferred Learning Styles and Their Teachers’ Preferred Instructional Styles: Do They Match?” Delta Pi Epsilon Journal 43, no. 3 (Summer 2001): 137-151.
- [20] Stitt-Gohdes, W. L. “Student Teachers and Their Students: Do Their Instructional and Learning Preferences Match?” Business Education Forum 57, no. 4 (April 2003): 22-27.
- [21] Stitt-Gohdes, W. L.; Crews, T. B.; and McCannon, M. “Business Teachers’ Learning and Instructional Styles.” Delta Pi Epsilon Journal 41, no. 2 (Spring 1999): 71-88.
- [22] Trochim , William M.K (2006) Research Method: Knowledge Base
- [23] Tucker, S. Y (1998).Teaching and Learning Styles of Community College Business Instructors and their Students: Relationship to Student Performance and Instructors Evaluations. A Dissertation in Virginia Polytechnic Institute and State University.
- [24] Understanding Different Learning Styles. Retrived September 23, 2009 from [http://www.ndt-ed.org/Teaching\\_Reseouce/ClassroomTips/classroomtips.htm](http://www.ndt-ed.org/Teaching_Reseouce/ClassroomTips/classroomtips.htm)