CONGRUENCE OF THE TEACHING AND LEARNING STYLES IN THE SENIOR HIGH SCHOOLS OF THE CITY DIVISION OF CANDON

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Abstract

This division-wide descriptive research endeavored to determine the congruence between teaching and learning styles among the schools offering the Senior High School Curriculum in the City of Candon (Ilocos Sur) for school year 2016-2017. Specifically, it centered on the teaching and learning preferences along active/reflective, sensing/ intuitive, visual/ verbal, and sequential/ global; and the congruence existing between the two. It used the Index of Teaching and Learning Styles of Soloman and Felder (1998). Frequency count and basic comparisons were used as tools for analysis. It found out that the teachers prefer reflective, sensing, visual and sequential styles while students prefer active, sensing, visual and sequential styles. There were only three (3) styles found to be congruent, which were sensing, visual and sequential. It is concluded that the teachers and students are fond of manipulatives and/or hands-on activities; prefer to present or see things; and think and work on an orderly manner. It offered a Teaching and Learning Style Interventions (TLSI) as the output of the study. Printed Materials are used as means for results dissemination

Keywords: Teaching Styles, Learning Styles, Teaching and Learning Styles Interventions (TSLI), Multiple Intelligences

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Introduction of the Research

Education is vital in nation building. It is also a potent factor in a human's life. If there is no progress in education, the nation and its people will also fail to prosper.

For education to become functional, its three core elements must always be considered. According to Corpuz and Salandanan (2016), the principal elements that make the teaching-learning process possible are the teacher, the learners, and the learning environment. Without one of the elements, there could be no teaching nor learning. Only when a positive relationship exists among these elements can the teaching-learning process occur; hence, harmony among the three elements proves vital in attaining quality education. To ensure coherence and harmony, the teaching-learning process mustbe learner-centered, practical, reach in its content, relevant and sensitive to changes. Gatchalian (2011) added that over and above all the considerations in achieving quality education, the teaching and learning styles must be congruent.

Learning styles speak to the understanding that every student learns differently. They are the cognitive, affective, and psychomotor behaviors which serve as the indicators on how students learn, perceive, interact, and respond to the learning environment (Gill, 2014). Teaching styles, on the other hand, include how a teacher manages instruction and class environment and how the teacher facilitates the class (Persaud, 2015). Both the teaching and learning styles can be typified as global, active, intuitive, reflective, sensing, sequential, verbal, and visual. Ensuring the congruence of the learning and teaching styles will help in the effective transfer of know-how to the students. When there is no congruence between the teaching and learning styles, there is a guarantee that learning will not take place; if it will, learning will not be at its best.

Additional testaments to the importance of the congruence between the teaching and learning styles include the ideas of several web articles. A web article stressed that only by examining each learner's multi-dimensional characteristics and learning preferences and/or styles that a teacher can become successful in teaching since the teacher is able to configure his/her style to the needs of his/her learners (Bar-Yam, Rhoades, Sweeney, Kaput, & Bar-Yam, 2002). Another article also opined that in order to succeed, effective teachers need to vary their teaching approaches to be adaptable and to be vigilant in gauging how students respond to their teaching style, the resources they use and the environment in which they are working (Darling-Hammon,1999).

In addition, Villanueva (2012) also shared the idea that effective teachers facilitate students' learning by providing highly engaging learning experiences which are both motivating and challenging to students. Effective teachers intuitively know that students' activities and academic achievement are improved when learning experiences revolve around the interests, talents and needs of students. An effective teacher can set up learning activities to students to address their diverse learning styles.

Further, Montemayor, et al (2009) also underscored that, students are not failing because of the curriculum; they fail because they are taught with methods and approaches not responsive to their learning styles.

It is then highly understandable that when the teaching and learning styles are incongruent, the students are the ones who suffer the most. The study of Manzano (2003) attests to this claim when she revealed that there is incongruence between the teachers' teaching styles and students' learning styles. The students listen to the teacher, but they cannot understand the subject matter. Others do not listen because they are doing other

things. On the part of the teachers, they are frustrated and felt sad about this. Teachers conjecture that there must be something misplaced in all these things.

With the pressing importance of the teaching and learning styles, the Department of Education through the Curriculum Implementation division mandated all the Senior High Schools of SY 2016-2017 to assess the learning styles of the students as one of the activities of the students in their three-week activity prior to the start of their formal classes. This is indicated in the prescribed daily learning logs (DLL) downloaded to each division and school for guidance and compliance. The Senior High Schools of the City Division of Candon was one with the Department in implementing the activity but different assessment tools were used by the teachers in the entire division. This means that a unified result was not produced. In addition, although there was an assessment, it was done informally and that the result is not fully taken into consideration by the teachers in designing their teaching. It is then imperative to investigate the congruence of the teaching and learning styles among the Senior High Schools of the City Division of Candon.

Zeroing in the aforementioned ideas on the essence of the congruence of the teaching and learning styles, it is therefore helpful to encourage both the teachers and students to identify and understand their learning styles and ensure congruence. It is with these precepts that this study is conceived for the Senior High School teachers and students of the City Division of Candon (Ilocos Sur). Determining the teaching and learning styles in the Division will help in attaining quality teaching and learning for all. This study will also prove beneficial in the Division's aim of improved learning as manifested by students' demonstrated competencies. Moreover, the immediate output of this study is to develop Teaching and Learning Styles Intervention (TLSI) to possibly match their styles to that of their students.

This research is also responsive to the Research Agenda set forth by DepEd Central Office along the research theme of teaching and learning, specifically along the area of instruction. The department order highlights research focusing on the individual learning styles and multiple intelligences of learners for them to compete in the current as well as future economies (DO 39, s 2016. Adoption of the Basic Education Research Agenda). Further, this research is also an answer to the DepEd Region 1 Research Agenda citing the need for the study on teaching and learning styles.

Literature Review

The following literature and studies have been reviewed to give light to the present study.

Multiple Intelligences and Learning Style Preferences

Howard Gardner's Multiple Intelligences Theory upheld that each person's intelligence is made up of autonomous faculties that can work individually or in concert with other faculties. The eight faculties are musical, bodily-kinesthetic, logical-mathematical, linguistic, spatial, interpersonal, intrapersonal, and existential (Marenu, 2010). This theory is valuable in helping teachers recognize and respond to differences in learning styles. Teachers must select appropriate activities that do not only teach the intelligences but also enhance the students through the things that they are being taught. Therefore, this theory implies that educators should recognize and teach to a broader range of talents and skills.

The emergence of differentiated instruction proves the need for the congruence of teaching and learning styles. Differentiated instruction means creating multiple paths so

that student of different abilities, interest or learning needs equally experience appropriate ways to absorb, use, develop and present concepts as a part of the daily learning process. Further, Mendoza (2000) recognized that differentiating instruction is an important tool for engaging students and addressing the individual needs for students. Also, Montemayor, et al (2009), stressed that each person learns in a unique way. If teachers want to teach each student effectively, they must veer away from harmonizing instruction and focus on providing differentiated instruction. The authors even underscored that it is only thru the learning style that instruction can become both effective and efficient at the same.

To address the need to assess the teaching and learning styles, two education researchers pioneered on the development of an on-line survey questionnaire. The *Index of Learning Styles* is an on-line instrument used to assess preferences on four dimensions (active/reflective, sensing/intuitive, visual/verbal, and sequential/global) of a learning style model formulated by Richard M. Felder and Linda K. Soloman. The instrument highlights the domains of the teaching and learning styles. First, the Sensing style is along the preference of concrete thinking, practical, concerned with facts, and procedures. Second, the intuitive style is along the preference of conceptual thinking, innovative, concerned with theories and meanings. Third, visual style is along the preference of symbols and representations. Fourth, the verbal style is along the preference of written and oral explanations. Fifth, the active style is along the preference of trying out things and working with others in a group. Sixth, the reflective style is along the preference of thinking things through, working alone, or with familiar partner. Seventh, the sequential style is along the preference of linear thinking, orderly and learns in small incremental steps. Lastly, the global style is along the preference of holistic learning.

Just as individual people have individual learning styles; teachers have teaching styles that work best for them. It is important that teachers should be aware of their teaching preferences when creating and designing instruction (Lathan, 2015). Thus, it is important that several

studies be reviewed to understand their salient findings.

Binay-an (2001) stated in his study that learners learn differently. They prefer more involvement, hands-on activities, and manipulation in their classes. People learn differentlybecause of their biological and psychological differences.

Manzano (2003) revealed that there is incongruence between the teachers' teaching styles and students' learning styles. The students listen to the teacher but they cannot understand the subject matter. Others do not listen because they are doing other things. On the part of the teachers, they are frustrated and felt sad about this. Teachers think that there must be something misplaced in all these things.

Gatchalian (2011) pointed out that teachers have varying teaching styles and students also have differing learning styles. Her research revealed that the sensing style is the only one congruent for both the teachers and the learners. The other styles are incongruent. The researcher developed an articulation scheme that the teachers can use to address the needs of their learners.

Villanueva (2012) found out that his students have varying needs and interest as manifested by their learning styles. He recommended that teachers must match their teaching styles to the learning styles of the students. He made an activity book considering the learning styles of his students.

The study of Tobias (2008) highlighted that student-respondents are characterized by significantly different *learning styles*: they preferentially focus on different types of

information, tend to operate on perceived information in different ways, and achieve understanding at different rates. Students whose learning styles are compatible with the teaching style of a course instructor tend to retain information longer, apply it more effectively, and have more positive post-course attitudes toward the subject than do their counterparts who experience learning/teaching style mismatches. All of the points raised by Tobias about the poor quality of introductory college science instruction can be expressed directly as failures to address certain common learning styles.

The International Centre for Educators' Learning Styles site offers explanations too on the four dimensions: *Sensing/Intuitive.* A sensor likes problem-solving, experimenting, and using the senses to gather data, while intuitors are fans of grappling with new concepts, innovating, and working with symbols; *Visual/Verbal.* A visual learner, believe it or not, does well with pictures, diagrams, and other scraps of info that come in through the eyes. A verbal learner does great with discussions and explanations, thriving when a mix of hearing and speaking get involved; *Active/Reflective.* Learners who do well with active experimentation are happiest when they get to test out their new knowledge in the real world. Their counterparts, the fans of reflective observation, prefer "examining and manipulating the information introspectively,"; and, *Sequential/Global.* One of these gains comfort with material that they're exposed to in a "logically ordered progression," and think based on "linear reasoning processes." The other one learns piecemeal, and usually have some sort of lightbulb moment when "the entire puzzle finally comes together." Guess which is which?

In addition, Felder and Soloman (1998) have synthesized findings from a number of studies to formulate a learning style model with dimensions that should be particularly relevant to education.

The dichotomous learning style dimensions of this model (sensing/intuitive, visual/verbal, inductive/deductive, active/reflective, and sequential/global) are continua and not either/or categories. A student's preference on a given scale (e.g. for inductive or deductive presentation) may be strong, moderate, or almost nonexistent, may change with time, and may vary from one subject or learning environment to another.

Sensing and Intuitive Perception. People are constantly being bombarded with information, both through their senses and from their subconscious minds. The volume of this information is much greater than they can consciously attend to; they therefore select a minute fraction of it to admit to their "working memory" and the rest of it is effectively lost. In making this selection, *sensing learners* (sensors) favor information that comes in through their senses and *intuitive learners* (intuitors) favor information that arises internally through memory, reflection, and imagination. (These categories derive from Carl Jung's theory of psychological types. The strength of an individual's preference for sensation or intuition can be assessed with the *Myers-Briggs Type Indicator*)

Sensors tend to be practical; intuitors tend to be imaginative. Sensors like facts and observations; intuitors prefer concepts and interpretations. A student who complains about courses having nothing to do with the real world is almost certainly a sensor. Sensors like to solve problems using well-established procedures, do not mind detail work, and do not like unexpected twists or complications; intuitors like variety in their work, do

not mind complexity and get bored with too much detail and repetition. Sensors are careful but may be slow; intuitors are quick but may be careless.

Sensing learners learn best when given facts and procedures, but most science courses (particularly physics and chemistry) focus on abstract concepts, theories, and formulas, putting sensors at a distinct disadvantage. Moreover, sensors are less comfortable than intuitors with symbols; since words and algebraic variables---the stuff of examinations---are symbolic, sensors must translate them into concrete mental images to understand them. This process can be a lengthy one, and many sensors who know the material typically run out of time on tests. The net result is that sensors tend to get lower grades than intuitors in lecture courses; in effect, they are selectively weeded out, even though they are as likely as intuitors to succeed in scientific careers.

Visual and Verbal. Visual learners get more information from visual images (pictures, diagrams, graphs, schematics, demonstrations) than from verbal material (written and spoken words and mathematical formulas), and vice versa for *verbal learners.* If something is simply said and not shown to visual learners (e.g., in a lecture) there is a good chance they will not retain it. Most people (at least in western cultures) and presumably most students in science classes are visual learners while the information presented in almost every lecture course is overwhelmingly verbal---written words and formulas in texts and on the chalkboard, spoken words in lectures, with only an occasional diagram, chart, or demonstration breaking the pattern. Professors should not be surprised when many of their students cannot reproduce information that was presented to them not long before; it may have been expressed but it was never heard.

Inductive and Deductive. Inductive learners prefer to learn a body of material by seeing specific cases first (observations, experimental results, numerical examples) and working up to governing principles and theories by inference; *deductive learners* prefer to begin with general principles and to deduce consequences and applications. Since deduction tends to be more concise and orderly than induction, students who prefer a highly structured presentation are likely to prefer a deductive approach while those who prefer less structure are more likely to favor induction.

Further, research shows that of these two approaches to education, induction promotes deeper learning and longer retention of information and gives students greater confidence in their problem-solving abilities. The research notwithstanding, most college science instruction is exclusively deductive—probably because deductive presentations are easier to prepare and control and allow more rapid coverage of material. In the words of a student evaluating his introductory physics course, "The students are given information simply to mimic and apply to problems. Let them, rather, be exposed to conceptual problems, try to find solutions to them on their own, and then help them to understand the mistakes they make along the way". The approach suggested by this student is inductive teaching.

Active and Reflective. Active learners tend to learn while doing something active---trying things out, bouncing ideas off others; *reflective learners* do much more of their processing introspectively, thinking things through before trying them out. Active learners work well in groups; reflective learners prefer to work alone or in pairs. Unfortunately, most lecture classes do very little for either group: the active learners never get to do anything, and the reflective learners never have time to reflect. Instead, both groups are kept busy

trying to keep up with a constant barrage of verbiage, or else they are lulled into inattention by their enforced passivity.

The research is quite clear on the question of active and reflective versus passive learning. In several studies comparing instructor-centered classes (lecture/demonstration) with student-centered classes (problem-solving/discussion), lectures were found to be marginally more effective when students were tested on short- term recall of facts but active classroom environments were superior when the criteria involved comprehension, long-term recall, general problem-solving ability, scientific attitude, and subsequent interest in the subject. Substantial benefits are also cited for teaching methods that provide opportunities for reflection, such as giving students time in class to write brief summaries and formulate written questions about the material just covered.

Sequential and Global. Sequential learners absorb information and acquire understanding of material in small, connected chunks; *global learners* take in information in seemingly unconnected fragments and achieve understanding in large holistic leaps. Sequential learners can solve problems with incomplete understanding of the material and their solutions are generally orderly and easy to follow, but they may lack a grasp of the big picture—the broad context of a body of knowledge and its interrelationships with other subjects and disciplines. Global learners work in a more all-or-nothing fashion and may appear slow and do poorly on homework and tests until they grasp the total picture, but once they have it, they can often see connections to other subjects that escape sequential learners.

Before global learners can master the details of a subject, they need to understand how the material being presented relates to their prior knowledge and experience, but only exceptional teachers routinely provide such broad perspectives on their subjects. In consequence, many global learners who have the potential to become outstanding creative researchers fall by the wayside because their mental processes do not allow them to keep up with the sequential pace of their courses.

Students whose learning styles fall in any of the given categories have the potential to be excellent scientists. The observant and methodical sensors, for example, make good experimentalists, and the insightful and imaginative intuitors make good theoreticians. Active learners are adept at administration and team-oriented project work; reflective learners do well at individual research and design. Sequential learners are often good analysts, skilled at solving convergent (single-answer) problems; global learners are often good synthesizers, able to draw material from several disciplines to solve problems that could not have been solved with conventional single-discipline approaches.

Teaching and Learning Style Interventions

Unfortunately−in part because teachers tend to favor their own learning styles, in part because they instinctively teach the way they were taught in most college classes−the teaching style in most lecture courses tilts heavily toward the small percentage of college students who are at once intuitive, verbal, deductive, reflective, and sequential. This imbalance puts a sizeable fraction of the student population at a disadvantage. Laboratory courses, being inherently sensory, visual, and active, could in principle compensate for a portion of the imbalance; however, most labs involve primarily mechanical exercises that illustrate only a minor subset of the concepts presented in lecture and seldom provide

significant insights or skill development. Sensing, visual, inductive, active, and global learners thus rarely get their educational needs met in science courses.

The mismatches between the prevailing teaching style in most science courses and the learning styles of most of the students have several serious consequences. Students who experience them feel as though they are being addressed in an unfamiliar foreign language: they tend to get lower grades than students whose learning styles are better matched to the instructor's teaching style and are less likely to develop an interest in the course material. If the mismatches are extreme, the students are apt to lose interest in science altogether and be among the more than 200,000 who switch to other fields each year after their first college science courses. Professors confronted by inattentive classes and poor student performance may become hostile toward the students (which aggravates the situation) or discouraged about their professional competence. Most seriously, society loses potentially excellent scientists.

These problems could be minimized, and the quality of education significantly enhanced if instructors modified their teaching styles to accommodate the learning styles of all the students in their classes. Granted, the prospect of trying to address 32 different learning styles simultaneously in a single class might seem forbidding to most instructors; the point, however, is not to determine each student's learning style and then teach to it exclusively but simply to address each side of each learning style dimension at least some of the time. If this balance could be achieved, the students would all be taught in a manner that sometimes matches their learning styles, thereby promoting effective learning and positive attitudes toward science, and sometimes compels them to exercise and hence

strengthen their less developed abilities, ultimately making them better scholars and scientists.

Major transformations in teaching style are not necessary to achieve the desired balance. Of the ten defined learning style categories, five (intuitive, verbal, deductive, reflective, and sequential) are adequately covered by the traditional lecture-based teaching approach, and there is considerable overlap in teaching methods that address the style dimensions short-changed by the traditional method (sensing, visual, inductive, active, and global). The systematic use of a small number of additional teaching methods in a class may therefore be sufficient to meet the needs of all of the students: (1) Motivate presentation of theoretical material with prior presentation of phenomena that the theory will help explain and problems that the theory will be used to solve (*sensing, inductive, global*); (2) Balance concrete information---descriptions of physical phenomena, results from real and simulated experiments, demonstrations, and problem-solving algorithms (*sensing*)---with conceptual information---theories, mathematical models, and material that emphasizes fundamental understanding (*intuitive*)---in all courses; (3) Make extensive use of sketches, plots, schematics, vector diagrams, computer graphics, and physical demonstrations (*visual*) in addition to oral and written explanations and derivations (*verbal*) in lectures and readings; (4) To illustrate abstract concepts or problem-solving algorithms, use at least some numerical examples (*sensing*) to supplement the usual algebraic examples (*intuitive*).; (4) Use physical analogies and demonstrations to illustrate the magnitudes of calculated quantities (*sensing, global*); (5) Give some experimental observations before presenting the general principles and have the students (preferably working in groups) see how far they can get toward inferring the latter (*inductive*); (5) Provide time in class for students to think about the material being

presented (*reflective*) and for active student participation (*active*). Occasionally pause during a lecture to allow time for thinking and formulating questions. Assign "one-minute papers" close to the end of a lecture period, having students write on index cards the most important point made in the lecture and the single most pressing unanswered question. Assign brief group problem-solving exercises in class in which the students working in groups of three or four at their seats spend one or several minutes tackling any of a wide variety of questions and problems; and (6) Encourage or mandate cooperation on homework (*active*). Students who participate in cooperative (team-based) learning experiences---both in and out of class---are reported to earn better grades, display more enthusiasm for their chosen field, and improve their chances for graduation in that field relative to their counterparts in more traditional competitive class settings.

Research Questions

This division-wide research aimed to determine the congruence of teaching and learning style preferences in the Senior High Schools in the City Division of Candon for school year 2016-2017 as basis for a validated Teaching and Learning Style Interventions (TSLI).

Specifically, it endeavored to answer the following:

1. What is the teaching style preference of the Senior High School Teachers in each of the following:

      a. Active/reflective;

      b. Sensing/ intuitive;

      c. Visual/ verbal; and

      d. Sequential/ global?

2. What is the learning style preference of the Senior High School Students in each

of the following:

      a. Active/reflective;

      b. Sensing/ intuitive;

      c. Visual/ verbal; and

      d. Sequential/ global?

3. Is there a congruence between the teaching and learning style preferences among the Senior High School students and teachers in the City Division of Candon?

4. What validated Teaching and Learning Styles Intervention (TSLI) can be proposed?

Scope and Limitation

The descriptive-developmental study is focused on determining the congruence between the teaching and learning style preferences of the Senior High School teachers and Students of the City Division of Candon (Ilocos Sur) for the school year 2016-2017. The data to be culled out from this research were used to develop the Teaching and Learning Style Interventions (TLSI) for the division. The Teachers who are not full time in teaching in the Senior High School are not included in the study. Students who incidentally get absent during the conduct of the study were replaced by a student using the pattern obtained in the systematic random sampling.

Research Methodology

a. Sampling

The respondents of the study were the Senior High School Teachers and Students of the five (5) schools offering the Senior High School Program in the City Division of Candon. A pre-survey was done for the population of the teachers and the students of the schools. The pre-survey was facilitated by consulting the administrative officer in-charge

of SHS records. For the teachers, the entire population is considered. For the students, the number has reached 500 and seemingly unmanageable, the Slovin's Formula is used. The distribution of the student-respondents is determined through systematic stratified random sampling. Coding was used to identify the students based on the systematic sampling codes.

The formula for Slovin's (SLC Research Statistics Manual, 2014) is:

$$n = \frac{N}{1+Ne^2}$$

where: N = population

n = sample size

e = margin of error (0.05)

Table 1 shows the distribution of the respondents. It can be seen in the table that the teachers' population and sample sizes are the same since the number is manageable for research. However, for the students sampling technique using distributive proportion is used.

Thus, there are a total of 20 teachers and 251 students distributed among the five (5) schools in the division. Further, to determine the specific student-respondents, the systematic random sampling is used. The formula is k = N/n where k is the interval, N is the population and n is the sample size. Since the N = 860 and n= 273, the interval (k) = 3. Thus, the 3rd student and the succeeding multiples were taken per school until the desired sample size of 273 is reached. The researcher also ensured that there is a student respondent in each class and in each strand. To ensure this, taking STNHS as an example, the 17 respondents were taken from all the sections by dividing the 17 to the number of sections.

Table 1. Distribution of the respondents

School	N (population)		n (sample)	
Candon National High School (CNHS)	10	418	10	156
Candon City High School (CCHS)	3	87	3	32
Candon City Information Technology National High School (CCITNHS)	4	53	4	20
Santo Tomas National High School (STNHS)	3	38	3	14
Don Ricardo Gacula Memorial National High School (DRGMNHS)	4	78	4	29
Total	24	674	**24**	**251**

b. Data Collection

To determine the teaching and learning styles of the respondents in the City Division of Candon, the index of teaching and learning style questionnaire was adapted from the On-line Index questionnaire developed by educator-psychologists Soloman and Felder (1998). The instrument can be accessed thru https://www.engr.ncsu.edu/learningstyles/ilsweb.html. The details about the reliability and validity of the instruments are also found in the links found in the website. Since the instruments are standardized, the validity and reliability of the instruments are already established. Gatchalian (2011) made use of the same sets of questionnaire in her Master's thesis which proved that the instrument is accepted in technical research.

The collection of data was done through the help of key people in the division. The researcher first sought the approval of the Schools Division Superintendent to float the questionnaire among SHS teachers and students. The principals and school heads were informed of the objectives of the research for clarity. The principals and the teachers were met individually and in groups for the objectives of the study and for the direction setting after the retrieval of the questionnaires.

To ensure that there are at least 251 student-respondents, the researcher floated more than the required number of questionnaires. Say, for CNHS, there was additional of 10 questionnaires for a section. This methodology proved effective since there were defective questionnaires during the data tallying. Such questionnaires were replaced by the extra ones.

The questionnaires were personally retrieved by the researcher.

c. Ethical Issues

To ensure ethics in the conduct of the research, the researcher bounds to strictly follow the research protocol of DepEd and the City Division of Candon. The respondents were not coerced to be part of the study. Their names were not reflected in any part of this research. Proper referencing was also done to ensure and protect copyright laws. Proper dissemination of the purposes and limits of the research to all concerned was done to ensure proper understanding of the research. Further, vacant periods by both the teachers and students were used in accomplishing the questionnaires.

d. Plan for Data Analysis

To give accurate analysis on the data collected, the following were used:

To analyze the teaching and learning styles, frequency count and percentages were employed. Frequency is the number of respondents who preferred item a or b.

Percentage is determined by dividing the number of respondents who preferred a or b over the total respondents. The count/percentages were subjected to the following categorizations to determine the level of style preference.

0%	no preference/ balanced preference
0.01%-20.00%	negligible preference
20.01%-40.00%	slight preference
40.01%-60.00%	moderate preference
60.01%-80.00%	high preference
80.01%-99.99%	very high preference
100%	excellent preference

Further, mean for the percentages was taken by adding all the percentages per item divided by the number of items. Difference is determined then further decision was based on the data categorization presented.

The teaching/learning preferences were determined by considering items

Active/reflective: items 1,5,9,13,17,21,25,29,33,37,41

Sensing/intuitive: items 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42

Visual/verbal: items   3,7,11,15,19,23,27,31,35,39,43

Sequential/ global: items 4,8,12,16,20,24,28,32,36,40,44

To determine the congruence between teaching and learning styles, the percentages of respondents who answered a and b respectively was compared for everything teaching and learning style. Congruence takes place when both the teaching and learning styles are the same.

Discussion of Results and Recommendations

Teaching Style Preferences of the SHS Teachers

The first problem dealt with by this study is on the teaching style preferences of the Senior High School Teachers in the City Division of Candon.

Active versus reflective preferences

It is indicated in Table 2 that the teachers prefer reflective teaching style over active teaching style. This is attested by the frequency of 143 (reflective) versus 121 (active). The difference of 22 signifies an 8.33% of reflective preference over active, indicating a negligible preference. Having a general reflective preference, the teachers let students to think things through. They want students to deal with a concept introspectively. They want students to deal with a material alone or with a familiar partner. Further, among the 11 situationers, seven (7) assumed the reflective teaching style while only four (4) for active. As reflective teachers, they present lessons where students process objects or materials introspectively. They are more into individual thinking activities where the students observe the material at hand. They also give time ample time for students to think thoroughly. They give ample time for students to think of answers including possible means on how to understand a material, solve a particular problem/situation or even perform a certain piece. They also let students develop an appreciation or affirmation of what is being done by providing reflective questions and reflection time integrating appreciative inquiry techniques. They let students realize the importance of the material to the real world.

Further, as regards management of class, reflective teachers want no unruly students. They prefer students who maintain proper seating arrangements regularly. They want students who know how to follow school and classroom rules and regulations.

Table 2. Teaching Style Preferences: Active Versus Reflective

Situationers	Frequencies of Preference		Difference of the frequencies	Corresponding percentage of preference	Preferred Style	Level of preference
	Active	Reflective				
I let my students understand something when I let them (a) try it out in groups (b) think it through alone	16	8	8	33.33%	Active	active
I present the days lesson where students (a) manipulate objects whilein class (b) process objects or materials introspectively things through before trying them out	8	16	(8)	33.33%	Reflective	Slight
I give my students time to (a) teach each other rather than relying on me (b) think and analyze things thoroughly.	7	17	(10)	41.67%	Reflective	Moderate
I assign students to come out with a (a) term project	13	11	2	8.33%	Active	Negligible

(b) one-minute papers to end the discussion						
I expect students to come out with or formulate (a) results which are outputs of intensive group deliberation (b) formulate at least a single pressing unanswered question after the lecture.	19	5	14	58.33%	Active	Moderate
I give time to my students to write (a)intensive report after the day's lesson (b)brief summaries after the days' lessons	6	8	(12)	50%	Reflective	moderate
I give time to my students to (a) be physically involved in all activities (b) think about how I'm going to do it.	10	14	(4)	16.67%	reflective	Negligible
When I teach, I (a)see to it that my students are	21	3	18	75%	Active	High

engaged in hands-on activities (b) have the ability to associate different emotional feeling with particular experiments						
I see to it that I (a)influence the thinking of my students (b)develop an appreciation or affirmation of what is being done	8	16	(8)	33.33%	Reflective	slight
I am a teacher who (a)allows students to move around from their seats during activities (b)highly follow rules and regulations in class	5	19	(14)	58.33%	Reflective	moderate
I am more likely to (a)include field trip, outdoor activities in my teaching (b)spend most of the time in classroom teaching	8	16	(8)	33.33%	Reflective	slight
Total	121	143	(22)	8.33%	Reflective	negligible

N=24 teachers   *7 reflective; 4 active*

They also prefer teaching in the classroom rather than going for a fieldtrip, outdoor sessions, and other learning opportunities outside of the four walls of the classroom. This finding runs parallel to the study of Gatchalian (2011) stating that her teacher-respondents are mostly reflective who prefer that students think thoroughly before trying them out.

From among the indicators, the highest reflective preference is that of the situation where the teachers give time to their students to write summaries after the day's lesson, which got 50% or moderate preference. This practice is really observed in the teaching of the students since the teachers want a synthesis of what was taught in the classroom.

Although the teachers are generally reflective, it is remarkable that the highest active preference is the situation where the teachers demonstrate the ability to associate different emotional feelings with particular experiments or materials under the study. This is because the teachers do not only focus on the cognitive and psychomotor but also on the affective domains of learning.

Sensing versus Intuitive Preferences

It is seen in Table 3 that teachers favor sensing teaching style over intuitive teaching style. This is attested by the frequency of 185 (sensing) versus 79 (intuitive). The difference of 106 signifies that teachers prefer sensing than intuitive by 40.15%, moderate preference. Having a general sensing preference, the teachers are more of concrete, practical thinking concerned with facts and procedures; in other words, they are pragmatics. In addition, nine (9) among the situationers are on sensing, one (1) only for intuitive while the other one gets a neither preference. This points out that the teachers focus on concrete information rather than the conceptual information. They highlight the practical side of a concept rather than zeroing in the definition and its sub-details. They also expose their students to well-structured instructions underlying how things are

Table 3. Teaching Style Preferences: Sensing Versus Intuitive

Situationers	Frequencies of Preference		Difference of the frequencies	Corresponding percentage of preference	Preferred Style	Level of preference
	Sensing	Intuitive				
I would rather be considered as a teacher who is (a) realistic, focusing on concrete information (b) innovative, centering on conceptual information	14	10	4	16.67%	Sensing	Slight
I am a teacher who adopts (a) modern methods of teaching (b) traditional methods of teaching	21	3	18	75%	Sensing	High
I prefer to use (a) facts (b) concepts	12	12	0	0%	Neither	Balanced
When I teach, I am more (a)pratical (b)imaginative	23	1	22	91.67%	Sensing	Very high
I prefer to use (a)at least one factual example to illustrate ideas (b)the usual concrete example	15	9	6	25%	Sensing	Slight
I expose my students to (a)well-instructed procedures	13	11	2	8.33%	Sensing	negligible

(b)something for my students to listen						
When I am reading for enjoyment, I like writers to (a)clearly say what they mean (b)say things in creative, interesting ways	5	19	(14)	58.33%	Intuitive	Moderate
When I teach, I (a)translate symbols to concrete mental iages (b)use symbols	17	7	10	41.67%	Sensing	Moderate
I am more directed towards (a)facts (b)concepts	20	4	16	66.67%	Sensing	High
When we analyze abstract situations in class, I (a)tend to tell my students to find out how they are applicable in real-life situations (b)miss important details	23	1	2	91.67%	Sensing	high
When I am teaching long calculations and/or processes, I	22	2	20	83.33%	Sensing	Very high

(a) tend to repeat all the steps and check the work carefully. (b) find checking work tiresome						
Total	175	79	106	40.15%	Sensing	moderate

N=24 teachers   9 sensing; 1 intuitive; 1 balance

understood the simplest way. They also teach a certain material by focusing on the practical aspect rather than its imaginative side. They also teach abstract concepts by relating the concept to its real-life applications, contextualizing on the rich experiences of the students. They also teach concepts by transforming abstract ones to their concrete counterparts. This finding is similar to that of Khandaghi (2011) who revealed that teachers teach by concrete concepts. Teachers are more of this style so students can have firm grasp of the lesson

Further, it is also noted that highest level of sensing preference is 91.67% (very high preference) under the teaching of a concept that connects that to its practicability and usefulness in the real-life context. This is highly felt in the Senior High school since the teachers utilize and implement a daily lesson log (DLL) that highlights the practical applications of the concepts of the skills taught and learned.

The only intuitive teaching style preference has a percentage of 58.33%, moderate preference. This is the situation on the reading enjoyment where the teachers want writers who say things creatively and interestingly.

Visual Versus Verbal Preferences

Table 4 purports the teachers' preference of visual over verbal teaching style. This is confirmed by the frequency of 151 (visual) versus 113 (verbal). The difference of 38

Table 5. Teaching Style Preferences: Visual Versus Verbal

Situationers	Frequencies of Preference		Difference of the frequencies	Corresponding percentage of preference	Preferred Style	Level of preference
	Visual	Verbal				
When I teach my students, I would rather use (a)pictures, diagrams, models, etc. (b)words, video tapes I get tuned to	16	8	8	33.335	Visual	Slight
When I teach, I prefer (a) the use of films, videos to explain concepts (b)discussion on how facts are derived	13	11	2	8.33%	Visual	Negligible
When I need to emphasize topics, I (a) give hand out for my students to read (b) write explanations on how answers are derived	6	18	(12)	50%	Verbal	moderate
When I present lessons, I (a) use pictures to match the words that I say (b) give verbal instruction or explanation	13	11	2	8.33%	Visual	Slight
I would rather teach the subject that (a)deals with models, graphs, schematics and demonstrations	16	8	8	33.33%	Visual	Slight

(b)needs a lot of explanations and discussions						
I associate best my teaching with (a) pictures (b) words	15	9	6	25%	Visual	Slight
I like students who are (a) careful but may be slow (b)quick but may be careless	18	6	12	50%	Visual	Moderate
I like to (a)see my students use symbols using class discussion (b) have my students do most of the discussion in class	12	12	0	0%	Neither	Balanced
I like to (a)put a lot of diagrams/illustration on the board (b)spend a lot of time explaining	16	8	8	33.33%	Visual	Slight
I encourage students to (a) draw or illustrate what they have understood (b) compose a song or write script for a role a play	18	6	12	50%	Visual	Moderate
When I evaluate my students, I (a) give emphasis on drawing, sketches, graphs, etc. (b) give credit to how they express themselves	8	16	(8)	33.33%	Verbal	Slight
Total	151	113	38	14.39%	Visual	Negligible

N = 24 teachers   8 visual; 2 verbal; 1 balance

signifies that teachers favor visual than verbal by 14.39%, a negligible preference. Having a universal visual preference, the teachers are oriented along symbols and illustrations; hence they are representation oriented. In addition, eight (8) among the situationers are under visual, two (2) verbal while the other one gets a balanced preference. This offers an idea that the teachers desire graphics and illustrations over words and explanations in teaching students. The teachers are more of the use of videos and visual presentations when teaching. This is attested by the frequent use of teachers of visual presentations (MS PowerPoint) and board illustrations (sketches, maps, etc.) They also match their lessons with some illustrations and models. They also ask students to use graphic organizers and models to represent what they know and have learned. They also allow students to be somewhat slow but careful with their actions.

The finding of the study is like the study of Villanueva (2012) when he recommended the use of visual materials like activity books so the students' learning styles will be considered.

This is also parallel to the statement of a web article that teachers teach with visuals. They want to keep students active and motivated in the classes by engaging them in activities, integrating stimuli such as drawings, illustrations, and the like.

Additionally, two situationers were rated highest (50%) under visual teaching style. This includes the desire of the teachers to ask the students to draw their learning and expectations of the teachers towards students who may be slow but careful of their actions. This is solidified by the outputs of the students which are graphic organizers, schemes, realias, models and the like. The teachers also want that students to show carefulness in their decisions as manifested by their patience.

The highest under verbal teaching style rated 50% is along the explanation of teachers when teaching. This is normal since the teachers are really oriented to explain concepts and ideas. They really elucidate the concepts until such time the students are able to grasp the key concepts. This is supportive of the 7E model of the Department of Education.

Sequential Versus Global Preferences

Table 5 declares the teachers' preference of sequential over global teaching style. This is substantiated by the count of 159 (sequential) versus 105 (global). The difference of 54 underscores that the teachers favor visual than verbal by 20.46%, a slight preference. With this universal sequential preference, the teachers are oriented along linear thinking; they want to teach students by smaller pieces; hence they are orderly teachers. In addition, nine (9) among the situationers are under sequential and two (2) for global. This gives an idea that the teachers teach first the general concepts before going to the specifics. They teach deductively presenting first the major concept before going into the details. They also give the outline of the lesson to let students know the different concepts that will be studies. When teaching problem solving, they also think of the steps that must be taught to the students first; this is done step by step. Teachers also start their lesson with numerical/literal examples and observations rather than general principles than deduce constructive applications.

This finding runs parallel to the concept presented by the International Centre for Educator's Learning Styles that sequential teachers are teachers that exposed their students to logically ordered progression.

Table 5. Teaching Style Preferences: Sequential versus Global

Items	Frequencies of Preference		Difference of the frequencies	Corresponding percentage of preference	Preferred Style	Level of preference
	Sequential	Global				
When I present the lesson, I tend to (a) Do it step by step (b) Provide the whole picture before the students could concretize on the details	20	4	16	66.67%	Sequential	High
I am more on seeing the (a)Trees before the forest (b)Forest before the trees	14	10	4	16.67%	Sequential	Slight
I find it easier to teach (a) facts (b) concepts	16	8	8	33.33%	Sequential	Slight
In starting a lesson, I (a)outline the topics (b)present the topics and their connections with related materials	7	17	(10)	41.67%	Global	Moderate
In starting a lesson, I (a)outline the topics (b)present the topics and their connections with related materials	8	16	(8)	33.33%	Global	Slight
When solving problems, I	17	7	10	41.67%	Sequential	Moderate

would be more likely to think of the (a)steps in the solution process (b)possible applications of the solution in a wide range of areas						
I start my lesson with (a)numerical/literal example and observations (b)general principles then deduce constructive applications	13	11	2	8.33%	Sequential	Slight
I prefer using (a)more concise and orderly procedures in teaching (b)highly structured procedures	15	9	6	25%	Sequential	Slight
I present (a)realistic examples to illustrate basic principles (b)the principles then discuss details	19	5	14	58.33%	Sequential	Moderate
I expose my students to (a)infer principles underlying the observations (b)deduce the application based on principles	16	8	8	33.33%	Sequential	Slight

When presenting topics, I prefer (a)specific to general (b)general to specific	14	10	4	16.67%	Sequential	Slight
Total	159	105	54	20.46%	Sequential	Slight

N = 24 teachers   *9 sequential; 2 global*

Further, the highest rated situationers under the sequential style is that of teaching the lesson step by step until the students get the overall idea of the lesson. This is attested by the rating of 66.67%, a high preference. This only points out to the fact that the teachers really want their students to learn the very details of the discussion.

It is also noteworthy to elucidate that the teachers present the topics and their connection with related materials. This got the rating of 46.67%, moderate preference and the highest among the global style preferences. This means that after presenting the lesson piece by piece, they also emphasize the connection of the lesson at hand to the previous lesson and to the ideas of other fields of interest. This is praiseworthy since the students can see the connections of their subject to a larger corpus of knowledge.

Learning Style Preferences of the SHS Students

The second problem dealt with by this study is on the learning style preferences of the Senior High School Students in the City Division of Candon.

Active Versus Reflective Preferences

It is revealed in Table 6 that students prefer active learning style over reflective learning style. This is attested by the frequency of 1464 (reflective) versus 1297 (active). The difference of 167 signifies a 45.0% active preference over reflective, indicating a moderate preference.

Table 6. Learning Style Preferences: Active versus Reflective

Items	Frequencies of Preference		Difference of the frequencies	Corresponding percentage of preference	Preferred Style	Level of preference
	Active	Reflective				
I understand something better after I (a)try it out (b)think it through	180	71	109	43.43%	Active	Moderate
When I am learning something new, it helps me to (a) talk about it (b)think about it	88	163	(75)	29.88%	Reflective	Slight
In a study group working on difficult material I am more likely to (a)jump in and contribute ideas (b)sit back and listen	169	82	87	34.66%	Active	Slight
In classes I have taken, I have (a)usually gotten to known many of the students (b)rarely gotten to know many of the students	182	69	113	45.02%	Active	Moderate

When I start a homework problem, I am more likely to (a)start working on the solution immediately (b)try to fully understand the problem first	42	209	(167)	66.54%	Reflective	High
I prefer to study (a) in a study group (b) alone	132	119	13	5.18%	Active	Negligible
I would rather first (a)try things out (b)think about I am going to do it	70	181	(111)	44.22%	Reflective	Moderate
I more easily remember (a)something I have done (b)something I have thought a lot about	163	88	75	29.88%	Active	slight
When I have to work on a group project, I first want to (a)have a group brainstorming where everyone contributes ideas (b)brainstorm	160	91	69	27.49%	Active	Slight

individually and then come together as a group to compare ideas.						
I am more likely to be considered (a)outgoing (b)reserved	126	125	1	0.40%	Active	Negligible
The idea of doing homework in groups, with one grade for the entire group (a)appeals to me (b) does not appeal to me	152	99	53	21.12%	Active	slight
Total	1464	1297	167	45.0%	Active	Moderate

N = 251 students   *8 active; 3 reflective*

Having a general active preference, the students prefer trying things out. When in a study group working on a difficult material, they are more likely to jump in and contribute ideas. They also like to be engaged in group activities. They also like games and physical activities. They learn a lot when all senses are reached. They want to explore, enjoy while learning; in short terms, they like to be key players in the classroom. According to the International Centre for Educators' Learning Styles, active learners love active experimentation, where they can test their knowledge in the real world.

This finding corroborates to the study of Binay-an (2001) when she revealed that her student-respondents love be engaged in the class, trying things out through manipulative, experimentations and the sort.

Further, from among the 11 situationers, eight (8) assumed the active style while only three (3) assumed the reflective style. As active learners, they want to participate in classroom activities. They do not want to just be sitting in their classroom all day receiving information from their teachers. They want to perform. They want to be with their group mates sharing ideas with one another. They want collaboration and cooperation as theu explore ideas of a particular subject. The new grading system of the K12 curriculum is slanted to this learning, that is, more percentage is given to the performance tasks rather on written assessments.

The situationers which got the highest rating among the active learning preferences is the one that pertains to a students who get to know many of the students, which received 45.02%, a moderate preference. This only indicates that the students are also into socializing. This is one of key characteristics of active learners. They want to widen their networks, their circle of friends. An active student really wants to get along with almost everyone in the class so that maximum participation during group activities will be realized.

Among the reflective situationers, the highest rating is that of the time when the students have homework, they try to think of its first, receiving a rating of 66.54%, a high preference. This indicates that students also think through and reflect for a while especially during assignments given by their teachers.

Sensing versus Intuitive preferences

It is seen in Table 7 that students favor sensing learning style over intuitive learning style. This is attested by the frequency of 1737 (sensing) versus 1024 (intuitive). The difference of 713 signifies that students prefer sensing than intuitive by 25.82%, a slight preference. Having a general sensing preference, the students are more of concrete

Table 7. Learning Style Preference: Sensing Versus Intuitive

Items	Frequencies of Preference		Difference of the frequencies	Corresponding percentage of preference	Preferred Style	Level of preference
	Sensing	Intuitive				
I would rather be considered (a)realistic (b)innovative	214	37	177	70.52%	Sensing	High
If I were a teacher, I would rather teach a course (a) that deals with facts and real-situations (b) that deals with ideas and theories.	200	51	149	59.39%	Sensing	Moderate
I find it easier (a) to learn facts (b) to learn concepts	188	63	125	49.8%	Sensing	Moderate
In reading nonfiction, I prefer (a) something that teaches me new facts or tells me how to do something (b) something that gives me new ideas to think about	109	142	(33)	13.15%	Intuitive	Negligible
I prefer the idea of (a)certainty (b)theory	159	92	67	29.69%	Sensing	Slight

I am more likely to be considered (a)careful about the details of my work (b)creative about how to do my work	142	109	33	13.15%	Sensing	Negligible
When I am reading for enjoyment, I like writes to (a)clearly say what they mean (b)say things in creative, interesting ways	92	160	(69)	27.49%	Intuitive	Slight
When I have to perform a task, I prefer to (a)master one way of doing it (b)come up with new ways of doing it	149	102	47	18.73%	Sensing	negligible
I consider it higher praise to call someone (a)sensible (b)imaginative	116	135	(19)	17.57%	Intuitive	Negligible
I prefer courses that emphasize (a)concrete materials (facts, data) (b) abstract materials	188	63	125	49.8%	Sensing	Moderate

(concepts, theories)						
When I am doing long calculations, (a) I tend to repeat all my steps and check my work carefully. (b)I find checking my work tiresome and have to force myself to do it.	181	70	111	44.225	Sensing	Moderate
Total	1737	1024	713	25.82%	Sensing	slight

N = 251 students   *8 sensing; 3 reflective*

thinking, practical, concerned with facts, and procedures rather than of conceptual thinking, innovative, concerned with theories and meanings. They want practical learning and not complicated ones. They want the facts directly given to them. They want that details given by the teacher give practical meaning to them. This finding supports the finding of Soloman and FelderS (1998) which underscored that sensing learners (sensors) favor information that arises internally through their senses not through their memory, reflection and imagination.

A sensing learner, they are more realistic dealing with facts and real-life situations. They are aroused when their real-life experiences are used as springboard or used to expound details of the lesson. They also want straight-to-fact discussions. They even want to read articles, books or stories that are straight-to-the-point. They do not want highfalutin or technical terms. They want the word that they use in their daily encounters. They also

tend to repeat all their steps and check their work carefully when prompted with long solutions.

Among the sensing style situationers, the students being considered realistic got a rating of 70.52% indicating a high sensing preference. This means that the students want to be practicable and sensible. They want to learn simply. They want to learn simple facts than complicated ones. They want lessons that directly apply to their practical world. They want to see clear connection of their lessons to their real world.

With regard to the reflective style situationers, the students want that when they are reading for enjoyment, the prefer writers to say things in creative, interesting ways. This got a rating of 27.49%, a slight preference. This only means that they want to imagine things when they are reading, especially when they read novel, short stories and the like. They want also to be creative in terms of picturing out the setting, the characters including the plot and the resolutions of the story.

Visual Versus Verbal preferences

Table 8 purports the students' preference of visual over verbal learning style. This is confirmed by the frequency of 1461 (visual) versus 1300 (verbal). The difference of 161 signifies that students favor visual than verbal by 5.83%, a negligible preference. Having a universal visual preference, the students are oriented along symbols and illustrations, sketches, visual presentations rather than listening to the teachers all day. They learn mostly by seeing.

In addition, as visual learners, when they think about yesterday, they likely get a picture than words. If they got held of a book to read, they focus more on the pictures and illustrations rather on the texts. They prefer magazines which are full of pictures than a book full of plain texts. In this regard, they prefer visual presentations where illustrations,

Table 8. Learning Style Preference: Visual Versus Verbal

Items	Frequencies of Preference		Difference of the frequencies	Corresponding percentage of preference	Preferred Style	Level of preference
	Visual	verbal				
When I think about what I did yesterday, I am most likely to get (a) a picture (b)words	138	113	25	9.96%	Visual	Negligible
I prefer to get new information in (a)pictures, diagrams, graphs, or maps (b) written directions of verbal information	91	160	(69)	27.49%	Verbal	slight
In a book with lots of pictures and charts, I am likely to (a)look over the pictures and charts carefully (b)focus on the written text	137	114	23	9.16%	Visual	Negligible
I like teachers (a)who put a lot of diagrams on the board (b)who spend a lot of time explaining	62	189	(127)	50.6%	Verbal	Moderate
I remember best (a)what I see	195	56	139	55.38%	Visual	Moderate

(b) what I hear						
When I get directions to a new place, I prefer (a) a map (b) written instructions	118	133	(15)	5.98%	Verbal	Negligible
When I see a diagram or sketch in class, I am most likely to remember (a) the picture (b)what the instructor said about it	117	134	(17)	6.77%	Verbal	Negligible
When someone is showing me data I prefer (a)charts or graphs (b)text summarizing the results	98	153	(55)	21.91%	Verbal	Slight
When I meet people at a party, I am more likely to remember (a)what they looked like (b)what they said about themselves	161	90	71	28.29%	Visual	Slight
For entertainment, I would rather (a)watch television (b)read a book	150	101	49	19.52%	Visual	Negligible

I tend to picture places I have been (a)easily and fairly accurately (b) with difficulty and without much detail	194	57	137	54.58%	Visual	Moderate
Total	1461	1300	161	5.83%	Visual	Negligible

N = 251 students   *6 visual; 5 verbal*

figures and diagrams are displayed rather than full words. They also remember best when they see the material not by simply hearing it. This is parallel to the education saying that goes, "Students learns when they hear; they learn more when they see; and learn best when they experience it". They also prefer learning by watching television or video clips rather than listening to the plain lecture of the teacher.

The highest rated visual situationers received 54.58%, a moderate preference. This situationers pertains to the tendency of the students to have an easy and accurate judgment of a material when they see pictures. On the other hand, the highest for verbal is that of the tendency to listen to teachers when they fully explain the lesson, especially if the material is quite complicated. This only indicates that pictures, to some extent, are not enough for them to learn, these must be accompanied by detailed and comprehensive explanations of the lesson.

Sequential Versus Global Preferences

Table 9 declares the students' preference of sequential over global learning style. This is substantiated by the count of 1566 (sequential) versus 1195 (global). The difference of 371 underscores that the students favor sequential than global by 13.44%, a negligible preference. Having a sequential preference, the learners prefer linear thinking.

Table 9. Learning Style Preference: Sequential versus Global

Items	Frequencies of Preference		Difference of the frequencies	Corresponding percentage of preference	Preferred Style	Level of preference
	Sequential	Global				
I tend to (a)Understand details of a subject but may be fuzzy about its overall structure. (b)Understand the overall structure but may be fuzzy about the details.	133	118	15	5.98%	Sequential	Negligible
Once I understand (a) All the parts, I understand the whole thing. (b) The whole thing, I see how the parts fit.	157	94	63	25.1%	Sequential	Slight
When I solve math problems (a) I usually work my way to the solutions one step at a time. (b) I often just see the solutions but then have to struggle to figure out the steps to get to them.	132	119	13	5.18%	Sequential	Negligible

When I'm analyzing a story or a novel (a) I think of the incidents and try to put them together to figure out the themes. (b) I just know what the themes are when I finish reading and then I have to go back and find the incidents that demonstrate them.	156	95	61	24.3%	Sequential	Slight
It is more important to me that an instructor (a) Lay out the material in clear sequential steps. (b) Give me an overall picture and relate the material to other subjects.	166	85	81	32.27%	Sequential	Slight
I learn (a) At a fairly regular pace. If I study hard, I'll "get it." (b) In fits and starts. I'll be totally	164	87	77	30.68%	Sequential	Slight

confused and then suddenly in all "clicks."						
When considering a body of information, I am more likely to (a) Focus on details and miss the big picture. (b) Try to understand the big picture before getting into the details.	78	173	(95)	37.85%	Global	Slight
When writing a paper, I am more likely to (a) Work on (think about or write) the beginning of the paper and progress forward. (b) Work on (think about or write) different parts of the paper and then order them.	164	87	77	30.68%	Sequential	Slight
When I am learning a new subject, I prefer to (a) Stay focused on that subject, learning as	161	90	71	28.29%	Sequential	Slight

much about it as I can. (b) Try to make connections between that subject and related subjects.						
Some teachers start their lectures with an outline of what they will cover. Such outlines are (a) Somewhat helpful to me. (b) Very helpful to me.	107	144	(37)	14.74%	Global	Negligible
When solving problems in a group, I would be more likely to (a) Think of the steps in the solution process. (b) Think of possible consequences or applications of the solution in a wide range of areas.	148	103	45	17.93%	Sequential	Negligible
Total	1566	1195	371	13.44%	Sequential	Negligible

N = 251 students   9 sequential; 2 global

They learn in an orderly manner but learn in small incremental steps. They do not prefer holistic learning that much.

As learners preferring sequential style, they prefer to understand details of a subject but may be fuzzy about its overall structure. They usually work their way to the solutions on step at a time. They also learn at a regular pace. They believe in the dictum, "If I study hard, I'll get it." They are the students who learn piece by piece but will surely learn something. They are also the students who stayed focused on that subject, learning as much about it as they can when dealing with a new or difficult subject. They are the students who want to learn step by step, following certain rules and procedures. When dealing with a problem, they want to learn first the steps on how to do it before they are to volunteer to solve it by pair or alone.

The highest rated situationers under the sequential learning preference is that of "It is more important to me that a teacher lays out the material in clear sequential steps", receiving a rating of 32.27%, slight preference. This only points out that the students want a demonstration first of the lesson, including the steps if possible. They do not want to discover on their own all the time. They want the teachers to demonstrate for them. This style is easier for them to learn. They are more of a deductive learner rather than inductive.

Moreover, the global situationers that got the highest rating is "When considering a body of information, I more likely to try to understand the big picture before getting into the details." This indicates that the students also try to see the general concept before going into the facts of the concept. For example, in learning the ecosystem, they want first to define what ecosystem is before going to the elements that constitute an ecosystem.

Congruence of the Teaching and Learning Style Preferences

The third problem of the study deal with the congruence of the teaching and learning style preferences in the Senior High Schools of the City Division of Candon.

It is reflected in Table 10 that three out of the four (3 out 4) preferences are congruent. This includes the sensing, visual and sequential preferences. This means that the teachers teach the students reaching all the senses of the learners. They ask their students to not only sit the all-day, but they want their student to experience so they can learn best. This style is preferred by the students. In addition, the students love to see visual presentations, videos graphs and maps. In return, the teachers also love to use pictures, video clips presented in their MS PowerPoint presentations. These visual preferences are aligned to each other. With regard to the sequential style, the teachers present the lesson from a general perspective then discuss the details of the lesson. They teach deductively. This matches the preference of the students to learn from general to specific. These students prefer that the teachers demonstrate to them how things are done.

On the contrary, the teachers' preference of reflective style does not match the learners' active style. The teachers' wants that the students think through before executing some actions. The teachers want the students to be sure of their actions and their answers before trying things out. The students, on the other hand, do not want to think things through; they want to try it out. Immediately. They want to test whether their initial thinking is correct or not. They want to experiment if their initial conception works or not.

This finding runs parallel to the study of Manzano (2003) that revealed that there is incongruence between the teachers' teaching styles and students' learning styles. The students listen to the teacher, but they cannot understand the subject matter. Others do

Table 10. The Congruence of the Teaching and Learning Style Preferences

Preference	Teachers	Students	Remarks
Actives Versus reflective	reflective	Active	Incongruent
Sensing versus intuitive	Sensing	Sensing	congruent
Visual versus verbal	Visual	Visual	congruent
Sequential versus global	Sequential	Sequential	congruent

not listen because they are doing other things. On the part of the teachers, they are frustrated and felt sad about this. Teachers think that there must be something misplaced in all these things.

Gatchalian (2011) also pointed out that teachers have varying teaching styles and students also have differing learning styles. Her research revealed that the sensing style is the only one congruent for both the teachers and the learners. The other styles are incongruent. The researcher developed an articulation scheme that the teachers can use to address the needs of their learners.

Moreover, Villanueva (2012) found out that his students have varying needs and interest as manifested by their learning styles. He recommended that teachers must match their teaching styles to the learning styles of the students. He made an activity book considering the learning styles of his students.

Recommendations

The following are the recommendations of the study based on its salient findings:

1. The validated intervention program should be adopted by the Senior High Schools in the Division of Candon.

2. A further study should be conducted to implement the program. Assessment study or action research can even follow to assess its effectiveness.

3. The teachers have to explore more on 21st century teaching methodologies to cater to the learning styles, interest and needs of the learners, across strands and grade levels.

4. A capability enhancement program can be staged to train the researchers on the new methodologies aligned to the different learning styles.

5. The learning and teaching style preferences questionnaire must be administered every start of the school year so the teacher can match their styles to that of their learners.

The Validated Teaching and Learning Style Interventions (TSLI)

I. Rationale

The Teaching and Learning Styles Interventions (TLSI) envisions congruent teaching and learning style preferences to ensure effective teaching and learning.

In the case of the Senior Schools of Candon City, the congruence was determined through intricate analysis as implemented in this research study. Important variables deemed necessary for the program such as teaching style preferences and learning style preferences which were studied and matched. The mismatch of one of the four styles, that is the reflective teaching style and active learning styles, served as basis for the TLSI.

II. Objectives

This program specifically intends to:

1. Specify the interventions for the TSLI; and

2. Offer specific measures to address the incongruence of the teaching and learning styles.

III. Development Directions and Interventions

This part indicates the development directions and interventions that should be pursued to enhance and sustain the effective teaching and learning in the Senior High Schools in the City Division of Candon.

Based on the results, there are six (6) initiative which are considered vital in the teaching and learning styles congruence. These courses of actions are directed toward greater quality outcomes.

1. **The adoption and administration of Teaching and Learning Style Questionnaires**. With the adoption and the annual administration of the questionnaires, the school including the administration can determine the learning preferences of the students. The teachers can have a firmer grasp on how to tailor instruction while the supervisors/ administrators can have one basis of supervision.

2. **Capability Enhancement Training for Teachers**. Trainings to further enhance the skills of teachers in facilitating learning should be done so the students' peculiar needs will be addressed during classroom instruction. For example, a training on differentiated instruction can be sought by the division so the teachers will be equipped with the necessary know-how.

3. **Benchmarking of Effective Teaching Practices**. The teachers can have benchmarking activities with their fellow in the school or interschool within and outside their divisions to get to know some effective instructional mechanisms that can suit students' learning styles.

4. **Improvement and Sustenance of Activities and Programme Anchored on the Learning Styles**. Learning cannot and does not only take place in the classroom. Holistic formation of the students is indeed a must. To do this, support systems that back up or even bolster students' learning should be improved and sustained. For example, the

sustenance of the Performance club for singing and dancing can further develop the abilities of students.

5. **Provision of 21st Century Facilities and Equipment.** Provision of 21st century facilities will enhance the teaching-learning process. It will boost the morale of the teachers and it will heighten the interest of the students to learn. ICT materials such as projector can even support the teaching and learning styles.

6. **Continuing Professional Education by Teachers**. Teachers should never stop learning. Once stagnations start, teachers cannot address the peculiar needs of the students. With continuous learning, the teachers can be further equipped with the necessities in teaching diverse learners. The CPE mechanisms can include, but not limited to, graduate school, LAC sessions, and intensified and focused peer observation.

Validity of the TLSI

The crafted interventions based on the results of the study were tested for acceptability and validity. Three prominent educators/ administrators were asked to assess the output of the study.

A validity questionnaire was used for this purpose. It made use of the validity parameters which included: acceptability, beneficiality, objectivity and usability. Results revealed a rating of 4.65, which means very highly valid. Thus, the interventions can readily address the significant findings of the study.

Dissemination and Advocacy Plans

The results of the action plan were disseminated to people concerned. The researcher coordinated with the Schools Division Superintendent and the Chief supervisors who are the research coordinator of the division. The five (5) schools and the division office, the Regional Office and the City Library were also furnished with a hardbound copy of the research, including the proposed TSLI.

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Financial Report

PARTICULARS	AMOUNT
Travel Expenses + Per Diem (Bus and Tricycle fare) - BERF Orientation	766.00
folders (tricycle fare =10)	98.00
bond papers (3 reams short hard copy,1 ream long hard copy)	685.00
Travel Expenses + Per Diem (Bus and Tricycle fare) - Literature Survey SLC	958.00
photocopy of questionnaires	2,080.00
tricycle rental snacks and lunch + per diem (for floating of questionnaires)	1,224.00
Travel Expenses + Per Diem (Bus and Tricycle fare + lib fee) - Literature Survey DMMMSU	1,015.00

Library fee (DMMMSU)	50.00
tricycle rental snacks and lunch + per diem (for retrieval of questionnaires)	950.00
lunch of principals and teacher-respondents for orientation	4,324.00
cum direction setting (floating of questionnnaires)	
load for contacting schools and follow-ups (for 1 week)	100.00
load for contacting schools and follow-ups/ internet (for 1 month)	300.00
internet load for the initial analysis	300.00
snacks during the treatment of data (plus per diem= 150)	370.00
ink (4 bottles) for Canon IP2770	320.00
snacks for validators	600.00
hard bound copies (10 copies)	3,000.00
fare going to SFC for the hardbound (plus per diem)	600.00
LBC (to send documents to the DepEd ROI) plus fare	350.00
TOTAL AMOUNT SPENT	18,090.00