Students' Attitude and Learning Satisfaction Towards Science and Its Effects on Academic Performance

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Abstract

This study envisioned to explore students' attitude toward Science as a subject and their learning satisfaction. The respondents of the study were 150 senior high school students of the San Josef National High School, Purok 1, San Josef Sur, Cabanatuan City, Nueva Ecija during the academic year 2018-2019. Both grades 11 and 12 students were considered taking into account their exposure to more varied academic activities in their subject in Science. Focus of the study were on two constructs: students' attitude toward Science and three measures of learning contentment: motivation, impressions towards formidable tasks, and comprehensibility of lessons. Socio-demographic of the learners were the profile variables for correlation. Academic learning performance was based on the grades obtained by the students in Science during the preceding school year. The Descriptive method of research was used in this study. The researcher used checklist and survey questionnaires as mean of gathering data. The data were treated by all of the formulas embedded in the trial version of SPSS (Statistical Package for Social Sciences). Students' attitude toward Science was found to be significantly related to the three aspects of learning satisfaction. Also, students' attitude towards Science and the three aspects of learning satisfaction had significant relationship to students' academic learning performance in Science. Since learners already had high learning gratification in terms of motivation, comprehensibility, and impressions towards formidable tasks, teachers of Science may incessantly monitor students' satisfaction and gratification in their quest for knowledge and in their desire to come up with competencies relative to Science.

Keywords: Academic Performance, Learning Satisfaction, and Students' Attitude.

INTRODUCTION

Attitudes towards Science, scientists, and learning Science have always been a concern for Science educators. Attitude is very broadly used in discussing issues in Science education and is often used in various contexts. Two broad categories are distinguishable. The first one is attitude toward Science (e.g., interest in Science, attitude toward scientists, or attitudes toward social responsibility in Science). *Attitude towards Science* can be defined as the feelings, beliefs, and values held about an object that may be the endeavor of Science, school Science, the impact of Science and technology on society, or scientists. The second one is scientific attitude (i.e., open-minded, honesty, or skepticism). *Scientific attitude* is the desire to know and understand, questioning to all statements, search for data and their meaning, search for verification, and consideration of consequences (Gardner, 2005; Osborne, Simon & Collins, 2009).

Research studies that indicate positive correlations between achievement in science courses and positive attitudes toward science, attitude and certain characteristics of the classroom environments that include personal support, use of a variety of teaching strategies, innovative learning activities, and student-centered instructional designs have all been reported in recent research journals (Osborne, Simon & Collins, 2003; Russell & Hollander, 2008; Shrigley, Koballa & Simpson, 2008; French & Russell, 2006). Attitudes towards science and scientists influence views of science, future career awareness, and classroom participation. Students who have positive attitudes show increased attention to classroom instruction and participate more in science activities (Germann, 2011; Jarvis & Pell, 2005).

MATERIALS AND METHODS
Respondents of the Study

The participants of the study were 150 senior high school students of San Josef National High School, Division of Cabanatuan City, Nueva Ecija during the academic year 2018-2019. Grades 11 and 12 students were the respondents.

Instrumentation

Students' Attitude Toward Science Checklist. This instrument to gather data was developed by the researcher with the assistance of her adviser. Her readings of professional books, magazines, literature, and her many years of teaching Science are of great help to come up with the various item-statements.

The checklist consists of 20 items to gain valuable information about a student's viewpoint towards Science as a subject. The respondents were offered five options for an answer which are the following: 5 – always; 4 – often; 3 – sometimes; 2 – rarely; and, 1 – never.

Verbal descriptions of each of the item-statements were arrived at using the arbitrary numerical guide which are the following: 4.2 – 5.0 – always; 3.4 – 4.1- often; 2.6 – 3.3- sometimes; 1.8 – 2.5 – rarely; and, 1.0 – 1.79 – never.

Learning Satisfaction Checklist. The checklist was adapted from Jones (1999) with some modifications to suit the direction of the study. While the original checklist was very general, the researcher specifically cited the subject of Science to enable respondents to associate with ease that this is the frame of reference for the evaluation.

The checklist consisted of three (3) parts with five (5) items each. Part I focused on motivation; Part II dealt with comprehensibility of lessons; and, Part III centered on impressions towards formidable tasks. Six alternative answers to select from were offered to the respondents, namely: 6 – totally agree; 5 – agree; 4 – slightly agree; 3 – slightly disagree; 2 – disagree; and, 1 – totally disagree.

To arrive at a verbal description of each of the item-statements, the following arbitrary numerical guide was followed: 5.16 – 6.00   - strongly agree; 4.32 – 5.14 - agree; 3.49 -4.31 -   slightly agree; 2.66 – 3.48 - slightly   disagree;   1.83   –   2.65   – disagree; and, 1.0 – 1.82- totally disagree.

Data-gathering Procedure

Permission from the Schools Division Superintendent, coursed through the Principal of the school was sought to allow the researcher to administer the instruments to the students. The researcher personally administered the checklist among the students. Teachers of Science were not around during the administration. The cooperation of fellow teachers not handling Science subjects was solicited to ensure success in the retrieval of the instruments. The objective of the research was explained to the students.

This study used the Complete Enumeration in collecting data from the student-respondents. According to Rao (2007), complete enumeration collects data from each and every unit (person, household, field, shop, etc.) as the case may be of the population or universe which is the complete set of items which are of interest in any

particular situation. Hence, all senior high school students of San Josef National High School served as the respondents of the study.

Statistical Treatment

Frequency distribution was used to describe the profile of the students. It refers to a table that shows a body of data grouped according to numeric values (de Belen, 2015). It was a tabulation of the values that one or more variables take in a sample. Each entry in the table contains the frequency or count of the occurrences of values within a particular group or interval, and in this the table summarizes the distribution of values in the sample. Kendall's tau-b and Spearman's rho formula were used to test the hypothesis. All statistical computations carried out used the Statistical Package for Social Science (SPSS) v.21. Please note that in the Results and Discussion, tables are deleted – they are found in the original article.

RESULTS AND DISCUSSION

Socio-Demographic Profile of Learner-respondents

Sex. There were 75 (50%) male of the learner respondents and 75 (50%) female.

Age. Age was distributed in three categories: 15-17 years old, 18-20 years old and 21-23 years old. Age bracket of 15-17 years old had the greatest number of respondents with 97 or 64.7%; 51 respondents or 34.0% were between 18-20 years old, and the age bracket between 21-23 years old had the least number of respondents.

Track. Majority of the respondents, 70 or 46.7% were General Academic Strand or GAS, 50 or 33.3% of the respondents were under Technical Vocation specifically ICT and EPAS and 30 or 20.0% were under Humanities and Social Science.

Combined Monthly Income of the Family . Most of the respondents or 30.0% were classified as poor income (Php 5,000-below); 24.0% were below average income (Php 5,001-10,000); 21.3% had an average monthly income (Php 10,001-15,000); 10.7% had above monthly income (Php 15,000-20,000); 8.0% had high income (Php 20,001-25,000); and only 6.0% or nine out of 150 respondents had above high income (Php 25,001-above). It implied that there were more poor families than rich ones in this study.

Parent's Highest Educational Attainment. Majority (58.7%) of the mothers of the respondents were graduate of secondary level; 22.7% were graduates of college level; 17.3% were graduates of elementary level and 1.3% or two out of 150 were graduates of their Master's and Doctoral Degrees.

Majority (55.3%) of the fathers of the respondents were graduates of secondary level; 24.7% were graduates of college level; 19.3% were graduates of elementary level and 0.7% or one out of 150 was a graduate of their Master's and Doctoral Degree.

Parent's Occupation. Both mothers and fathers of the respondents were mostly laborers, 87.3% for mothers and 79.3% for the fathers, respectively. It implied that since most of the parents of the respondents were in secondary level in terms of educational attainment, their occupation was usually in least category.

Sixteen out of 150 mother-respondents were employed while 10.7% of the father-respondents were self-employed. Only 2.0% of the mother- respondents were self-employed while 8.0% of the father-respondents were employed. Civil servant occupation had the least percentage of all.

Academic Performance of the Learner-Respondents (in previous academic year). Majority of the respondents were fairly satisfactory in their academic performance or 61.3%; 23.3% were satisfactory; 10.7% were very satisfactory; and 4.7% of the population were outstanding in their academic performance.

Learner-Respondents Attitude Towards Science as s Subject. Table 1 shows the attitude of the respondents towards Science. Majority of the students were found to be favorable in their attitude towards Science. It was noteworthy to observe that no student was found to have unfavorable attitude. Result suggests that a big number of the students feel the many advantages of becoming skilled in Science. The students were optimistic on the value of Science. Finding gives the impression that the students were reasonably aware of the advantages and benefits of the subject and the positive prospects of the subject in any profession they may desire to pursue.

Always to the respondents were the following: they appreciate the efforts of their teacher in Science in the manner he/she presents the lessons; and escalate the uses of different materials by their teacher to make them easy to understand the Science subject.

Also, often to the respondents were the following: they do their projects and assignments diligently; they show eagerness and interest in the subject; learning new concepts in Science is something they enjoy; they do not feel any boredom; they are very attentive in listening; they feel satisfied in their accomplishment and the way they interact with their classmates during Science class; they love Science; and they are not complaining about the difficult projects/activities that the teacher requires them to do.

Furthermore, the average weighted mean (3.9), showed that the respondents had fairly positive attitude towards Science.

According to Sheeba (2013), students were cognizant of how useful the subject Science is for them. They firmly believe that facts, theories, and concepts and information of the subject may help students appreciate what goes on in their homes and in other environments. Teachers avowed that students will need Science for their future work and life in many ways and in whatever jobs the students will have in the future. How important Science is as a subject from students' evaluations, Science as a subject has an impact on their learning. When students feel that what they are doing are important, the more they will be motivated to bring out the best in them. The earnestness and enthusiasm of students to acquire knowledge becomes more fulfilling when they feel that the subject is very valuable to them. Learning Science as a subject can become a source of inspiration for the students. Itis noteworthy to observe that the students' self-worth is very positive arising from their evaluations that they can be a success in the acquisition of knowledge. This is a manifestation of their feelings of being plausible as a consequence of their familiarity in Science.

Learner-Respondents Learning Satisfaction in terms of Motivations. Table 2 shows learning satisfaction of the respondents in terms of motivations. It implied that all respondents were motivated towards Science as a subject. Respondents all agreed in the different statements of motivations. In terms of learner's motivation, respondents were mostly satisfied in the different statements given.

Miller (2004) says that motivation to learn depends upon such factors as the learner's purpose or interest, objectives and goals, his self-confidence, his levels of aspiration, his knowledge and appraisal of how well he is doing in relation to his goals. It is thus, the job of the teacher to create an atmosphere which provides desirable outlets for students' needs in the direction of worthwhile incentives – an atmosphere in which interests will, as a consequence, flourish.

Learner-Respondents Learning Satisfaction in terms of Impressions towards Formidable Tasks. Table 3 presents the learning satisfaction of the respondents in terms of impressions towards formidable tasks. Respondents escalate formidable tasks in positive ways. They were mostly satisfied in all areas.

The students agreed to the following item-statements: they experience

challenges on their abilities, skills, and expertise in their Science classes; they had opportunities to use their unique abilities; their performance in Science is a product of the efforts they exerted; they felt excitement in their class in Science; and, they encountered various challenges in their subject in Science.

Panitz (2015), stated that students find fulfillment in things they do and learn when they feel that the tasks assigned require the utilization of their abilities, skills, and expertise. When students experience and feel that their potentials are challenged, they feel more energized. Whatever formidable tasks that come their way can be easily and comfortably achieved as they feel these are challenges. In Addition, Montenegro (2020), stated that collaborative and competitive learning styles are the most dominant learning style of the students finding formidable task to do effortlessly and contentedly.

Learner-Respondents Learning Satisfaction in terms of Comprehensibility of Lessons. Table 4 shows the learning satisfaction of the respondents in terms of comprehensibility of the lessons. The students agreed that they were very much aware of what they expect in their class in Science; likewise, they know their duties and responsibilities as they enter the class; they were fully aware of their limitations in Science; they had a clear idea of who they were in their class in Science; and, that every subject in Science seems clear to them. Respondents considered their Science subject as something very valuable although they know their limitations in Science.

Philips (2011), stated that students' self-esteem is commendatory as they feel they had a clear idea of who they were in their class in Science. Boredom and tediousness among students were not in attendance as they were conscious that every subject matter in Science seems comprehensible and understandable to them. Conscientiousness characterizes the students as they were acquainted with whatever duties and responsibilities they had to undertake as they enter their class in Science.

Socio-Demographic Profile and Attitude towards Science. Table 5 shows the relationship between the socio-demographic profiles of the respondents to its attitude towards Science. It revealed that sex, age, combined monthly income of the family, parent's educational attainment and occupation had no significant correlation to the attitude of the respondents towards the Science subject. This means that these factors do not influence the attitude of the respondents toward Science as a subject. Thus, results accept the null hypothesis, "There is no significant relationship between the

socio-demographic profile of the students and their attitude toward Science as a subject". Contrary to the study of Slaughter (2007), he found out that there was a correlation between socio – demographic like income of the family and parent's occupation to the attitude and academic performances of the learners. There could be several reasons for this correlation between income and attitude and academic performance. "Many times, parents do not take the time to read out loud to their children, and some parents cannot read themselves. This impacts student achievement" (Evers & Peter, 1996, p. 2). If parents were not successful in school themselves, chances are that their children will not be successful either.

Table 6 presents the relationship between socio-demographic profile of the students and learning satisfaction along motivation, impressions of formidable tasks and comprehensibility of lessons. Among the socio-demographic profiles of the respondents correlated, only the mother's educational attainment was found to have significant relationship (0.169*) with the learning satisfaction of the respondents in Science subject in terms of motivation.

Mother's educational attainment had r value of 0.169*, it implies that mother's educational attainment was significantly related to the learning satisfaction of the respondents in Science subject in terms of motivation. Consequently, this result rejected the null hypothesis, "There is no significant relationship between the socio-demographic profile of the students and their learning satisfaction along motivation, impressions of formidable tasks, and comprehensibility of lessons".

Jacqulynm, (2005), pointed out the relationship of parents' education level to their children's academic achievements. A mother's education has more influence than a father, so mother's education is more important. Karshen (2003) says that students whose parents are well educated get higher positions than those whose parents are not educated. Educated parents help their children in school work activities.

Other studies have found out that there is a strong correlation between parents' educational level and students' learning satisfaction. Authors, such as Hushak (2003) say that students whose parents have bachelors or graduate degrees, in a sense have private instructors who are probably have more knowledgeable in one or more areas than any of the students' high school or college instructors.

According to Gooding (2001), there were slight but not statistically significant differences between parents' high school educational levels and parents' educational level of some college. There was a statistically significant difference between the great

significance between parental education category of high school and the parental educational level of graduate degree. Table 6 also reveals that there was no significant relationship between the socio-demographic profile of the students and their learning satisfaction along motivation specifically; sex, combined monthly income of the family, father's educational attainment and parent's occupation.

Along the impressions towards formidable tasks, socio-demographic profiles of the respondents had no significant correlation. Thus, the null hypothesis was accepted. Table 6 also shown that there was no significant correlation between the age, combined monthly income of the family, parent's educational attainment and parent's occupation to the learning satisfaction along comprehensibility of lessons. Thus, this means that the null hypothesis is accepted.

Sex had r value of 0.178*, it implies that sex has significant relationship to the learning satisfaction of the respondents along comprehensibility of lessons. Hence, the null hypothesis was rejected. Dilla (2007) found out that females perform better that males in English I. His findings supported Hibayas findings (2005) when he found out that female learners tend to attain higher degree of education than males do. The female students are more prominent in their discernment that their strong sense of self-determination enables them to come up with all requirements and assignments in Science. Besides, female students tend to see themselves more as individuals who persevere and do possess traits of self-motivation and will-power. Vicmudo (2001) in her study about scientific performance of common first year in CLSU found out that female students performed better than males. Boys are generally playful at their young age, while girls tend to be more serious for, they early mature than boys.

Attitude Towards Science and Learning Satisfaction

Table 7 shows the relationship between attitude towards Science and learning satisfaction along motivation, impressions of formidable tasks and comprehensibility of lessons. It presents the correlation coefficients to test the hypothesis. The obtained r- values: 0.558** for motivation; 0.624** for impressions towards formidable tasks; and, 0.561** for comprehensibility of lessons disclosed that students' attitude towards Science was highly significant related to their learning satisfaction.

In a study conducted by Chang and Chang (2012), learning attitude and satisfaction appears strongly correlated with learning motivation, emphasizing the importance that teachers must place on the educational efforts that are aiming to meet

the specific needs of learners. Such educational efforts are likely to lead to a state described by Flammger as a joy of fulfillment and feeling of sufficiency, in the sense that students' needs are met (and therefore temporarily deactivated) and the psychological tension resulting in active needs is diminished.

The more the students feel that they are the type of students who will do well in Science – the more the students will become highly motivated to come up with competencies in Science. The more intense the students are in the projection of self-confidence, the more conscientious they will become and be more aware of the effects and advantages of Science as a subject. Likewise, the more favorable the attitude of students have toward Science - the more the students feel that activities and learning scenarios in their classes in Science contribute much to their welfare and to their future. The less hostile the students are relative to the demands of rules in the use of correct Science and the challenges that come their way – the less anxious, confused, and apprehensive students will be. Furthermore, the more self-assuring students are – the more favorable their perceptions and convictions will be that they can go through all the requirements of their subject in Science.

The hypothesis was rejected. Students' attitude toward Science is significantly related to the three measures of learning satisfaction: motivation, impressions towards formidable tasks, and comprehensibility of lessons.

According to Topala (2014), those who declare themselves interested and enthusiastic about learning at higher levels of intensity also find high satisfaction in the aspects regarding the teaching act.

Attitude Towards Science, Learning Satisfaction and Academic Performance

Table 8 presents the coefficients of correlation to test the hypothesis: *'Students' attitude toward Science and their learning satisfaction along motivation, impressions towards formidable tasks, and comprehensibility of lessons did not have significant relationship with their academic performance in Science"*.

Obtained coefficient of correlations showed that students' attitude towards Science and the three aspects of learning satisfaction had significant relationship on students' academic performance in Science.

Obtained coefficient of correlations were: attitude (0.337**); motivation (0.261**); impressions towards formidable tasks (0.346**); and, comprehensibility of lessons (0.370**). Results suggest that the more favorable the attitude of the students

were in Science, the more will the possibility for students to improve on their academic learning performance be. The degree or level of students' attitude towards Science has significant relationship to their academic learning performance. Findings imply that the following circumstances associated with students' attitude had an impact on their academic learning performance.

Learning satisfaction plays a major role in shaping a student to become successful in pursuing their education. On the other hand, high academic performance of students is an outcome of their learning satisfaction. Previous studies indicated that learning satisfaction of students does not influence their performance, but academic performance influences the learning satisfaction of the students (Lee, 2008.)

Contrary to the findings of this study, according to Manarin and Nibaten (2013), students' learning satisfaction and academic performance had no significant relationship. Thus, one can conclude that satisfaction of students themselves does not guarantee a high or low grade. Earlier studies clearly stated that there are other factors that may affect students" academic performance. According to Grayson (2004), character is a factor that keeps a student highly motivated in achieving greater results in learning. Another factor is the effectiveness of the teacher, which can be one of the main factors that may influence the grade of a student. A teacher's effectiveness leads students to interact within the classroom, which may lead to higher academic performance. However, students" perceptions of interaction were not related to the grade they achieve (Maksoud and Fahmy, 2007.) It is acceptable that the said variable is one of the factors that can make a student satisfied but on the other hand, perception towards the class interaction itself is not enough for a student to perform. This statement readily lends support to the present study's claim that a student's perception toward academic staff does not influence academic performance.

Science is a very important subject. The excitement, pleasure, and enjoyment students experience when participating in different activities; and, their feeling at ease in their subject in Science can contribute to students' attainment of success.

Likewise, students' high motivation, self-confidence, and favorable perceptions of their accomplishments in the subject in Science are conditions that help propel students to achieve positive progression in the subject. Furthermore, the greater the students feel being challenged in Science, the more the students feel the benefits from the adversities and ordeals that will come their way. Challenges make students more determined to achieve. Intricacies and complexities of tasks to be undertaken help

students situate them into brighter perspectives as well as the stipulations of encouragement, motivation, and inspiration.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this study, the following conclusions were drawn:

1. There was an equal number of respondents in terms of sex, age bracket of 15-17 years old had the greatest number of respondents, Academic track (General Academic Strand or GAS), classified as poor income family, and parents were graduates of secondary level and were laborers. Meanwhile, majority of the respondents had an average grade in Science 10;
2. Majority of the respondents were found to have fairly satisfactory achievement in their academic performance;
3. Majority of the students were found to be favorable in their attitude towards Science;
4. Majority of the students were high in their learning satisfaction in terms of motivation; high to very high in their impressions towards formidable tasks; and, high in their learning contentment in terms of comprehensibility of lessons;
5. In terms of relationship, socio – demographic of the learner – respondents had no significant correlation to their attitude and learning satisfaction towards Science. Students' attitude toward Science was found to be significantly related to the three aspects of learning satisfaction. Also, students' attitude towards Science and the three aspects of learning satisfaction had significant relationship on students' academic learning performance in Science.

In view of the aforementioned conclusions, the following recommendations are hereby offered:
1. To improve the academic performance of the learners, teachers of Science may unceasingly exert efforts to intensify further students' activities that are more engaging and gratifying;
2. Since learners already had high learning satisfaction in terms of motivation, comprehensibility, and impressions towards formidable, teachers of Science may incessantly monitor students' satisfaction and gratification in their quest for knowledge and in their desire to come up with competencies relative to Science;

and

3. Teachers may always resort to motivation, provide challenging activities, and monitor students' success in school work.

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