

ATTITUDE AND LEVEL OF PERFORMANCE OF STUDENTS IN CHEMISTRY

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ABSTRACT--This study determined the attitude of students in chemistry. It further determined the relationship of their attitude to their performances in Math, Chemistry and English. There were 244 respondents in this study coming from select higher education institutions in Cagayan. This study made use of the descriptive-correlational method to describe the personal variables and attitude of the respondents. It is correlational since it also tried to determine if there is relationship in the attitude of students and their performance in Math, Chemistry and English by using the person product correlation. The researcher made use of the questionnaire to gather the data. It was found out that the attitude of students is significantly related to their performance in Chemistry which applied that students whose attitude is positive had better performance in the cognitive subjects. Consequently, those students who had negative attitude towards the cognitive subjects like chemistry performed lower in the subject. It is recommended by the researcher that Chemistry teachers should emphasize the difficult concepts and skills of cognition and that students must be taught "to be active strategic learner". Analytical and critical approach to chemistry learning should be emphasized also in the classroom. Finally, teachers should device a strategy to develop positive attitude towards chemistry that would likely result to achieving better performance.

Keywords-- cognitive subjects, strategic learner, analytical and critical approach

I. INTRODUCTION

Science education in the Philippines is still in the developmental age. Changes are constantly introduced to improve the quality of instruction in all levels. The curriculum is revised so often in the hope of unlocking Filipino students' difficulties in the subject.

The third millennium is a witness to the relative advancement of science and technology and has introduced enormous changes in our socioeconomic environment. In order to cope with the tremendous changes of age, science education must be made relevant to cope with these challenges. It is the teacher's task to make science learning an attractive and enjoyable experience for every student.

According to Ople (1993) "...in a periodic test given to 14 -year old student in the field of Science and Mathematics, the Filipino student always rank the lowest". Various studies had pointed out students' low or even dismal achievement in Science at all levels of education. Studies have also shown that many pass their science subject without acquiring proper understanding of the concepts and theories that the course intends to teach. (Ferrido, 1995). Problems of these type have been identified in different areas of science including Chemistry.

Chemistry is considered a difficult subject even among science majors because the fundamentals behind the world of atoms and molecules are abstract. Most undergraduate students consider chemistry at the college level

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as neither interesting nor important with the exception of the potential chemistry majors. Most general chemistry students simply dislike the subject or exhibit fear of it. This negative attitude toward the subject maybe due to several factors: the abstract nature of chemistry, the passive nature of students who just listen and take down notes rather than participate in class discussions, or the very nature of classroom instruction (Enriquez, 1994).

Chemistry is viewed as a clearly defined sequence of topics, a compilation of facts rather than a way of thinking about the natural world. College students simply take the subject to satisfy the graduation requirement of the degree program. Unfortunately, they do not perceive chemistry as related to their immediate environment. They frequently think of chemicals as hazardous materials with unusual names. Previous studies have identified other barriers to the learning of chemistry, such as complex nature of chemistry concepts, language, practical work, and unfamiliar materials (Gabel, 1999).

The complex nature of chemistry can be attributed to the representation of matter, the symbolic level, where the chemist represents the concepts through the use of symbols, formulas, and equations.

Crosby (1985) summarized his view on the present state of chemistry education as:

“Somehow the chemistry curriculum is not appealing to the students. Our concern manifests itself in various ways. We charge that the freshman course is too principle-oriented that there is not enough descriptive chemistry, that the students are being turned-off by our approach to the subject. Some claim that there is just too much material in the course, that the books are too thick, the facts are too oppressive, the coverage is too suffocating, the laboratory is unexciting and irrelevant.”

The Soviet psychologist, Lev Vygotsky Howe (1996) claimed that both scientific and everyday concepts develop overtime. Teaching science concepts in school is the beginning of the development of a concept. Concept learned in schools remain a verbalism until it is applied to situations encountered in everyday situations. Equally difficult tasks are the incorporation of real experience into scientific conceptual framework and the application of scientific concepts to real life situations. These are cases where students are unable to apply the concept learned in school to everyday experience.

Having positive attitudes towards a school subject would involve behaviors such as willingness to participate in a lesson, satisfaction by responding to questions, accepting one's own value and agreeing one's value to be recognized (Ozcelik, 1998).

Kaya, O. G. (2011) mentioned that one of the aims of science education is to develop positive attitudes toward science in students because there is significant relationship between students' achievement in science and their positive attitudes toward science. Therefore, teachers should aim to develop students' attitudes toward science besides their understanding of scientific concepts in science classroom and consider the factors affecting students' attitudes toward science

What factors contribute to the achievement of the students in chemistry and the attitude they have towards the subject? The researcher tried to answer this question in this study.

Statement of the Problem

This study aimed to assess the attitude and performance of students in chemistry in tertiary schools in Cagayan. Specifically, it sought to answer the following questions:

1. What is the profile of students in terms of their Mathematics, Chemistry, and English performance?
2. What is the attitude of students towards chemistry?

3. What is the level of performance of students in chemistry?(to be deleted because no data to support the prob)
4. What is the relationship of attitude and performance of students in chemistry?

Hypothesis

There is no significant relationship in the attitude and performance of students in chemistry.

II. METHODOLOGY

Research Design

This study made use of the descriptive-correlational design. Descriptive in the sense that it described the attitude possessed by the respondents in the tertiary schools. It also described the performances of the respondents in the areas of Mathematics, English and Chemistry. It is correlational since it also determined the relationship of the students' attitude and performance in chemistry. Frequency, percentage, mean and standard deviation were used to analyze the personal variables. The Pearson Product Correlation techniques was used to determine the relationship between students' attitude and performance in chemistry.

Respondents and Sampling Procedure

The respondents of this study are the first year students of selected tertiary schools in Cagayan. The selected respondents comprised only one section and were chosen using random sampling. Complete enumeration was used in some selected sections.

Table 1: Distribution of students by school

Respondent Schools	Sample
CSU- Aparri Campus	23
International School of Asia and the Pacific	40
Lyceum of Aparri	16
Florencio Vargas College	33
CSU- Andrews Campus	47
CSU- Lallo Campus	49
CSU- Sanchez Mira Campus	36
Total	244

Locale of the Study

The study was conducted in the tertiary schools in Cagayan. These are CSU- Aparri Campus, CSU Andrews Campus, CSU Lallo Campus and CSU Sanchez Mira campus. These are state universities in Cagayan. Three

private colleges also participate, namely, the International school of Asia and the Pacific, Lyceum of Aparri, and Florencio Vargas College.

Research Instrument

The principal instrument used in this study was a structured questionnaire adapted from the study of Villaflor (1987) which was modified by the researcher based on the following concepts: Kinetic Molecular, Gas Laws, Formula Writing, Chemical Reaction, Periodic Table and Periodicity, Particles of Matter, Orbitals and Levels of Energy, Bonding, Acids and Bases, Redox and Stoichiometry. The questionnaire consisted of three parts. Part I dealt with the students' personal variables including Math, Chemistry and English performance. Part II determined the students' attitude towards chemistry. The instrument used was based on Ibe's attitude test for mathematics and was modified to suit for chemistry. The respondents were instructed to indicate the extent of truthfulness to each statement by rating and encircling the number of the given options. The scoring of the positively oriented statements is as follows: (G) Generally true of me, 3; (M) Moderately true of me, 2; (N) Not true of me, For negatively oriented statements, the scoring was reversed.

Data Gathering Procedure

Permission to conduct the research was sought from the school heads of the different respondent schools. A request letter was prepared by the researcher to this effect after which, they were personally delivered by the researcher for approval. Upon having the request granted, she personally administered and retrieved the questionnaire from the respondents. This gave the researcher a chance to guide the respondents in accomplishing the questionnaire. The researcher also conducted an informal interview with some of the respondents to gather additional data needed in the study.

Statistical Tools and Analysis

Table 1: The scale below was used in describing the weighted grade average or performance of respondents in Math, Chemistry and English:

Scale Value	Category
1.00 – 2.38	High
2.39 – 2.88	Average
2.89 – 3.00	Low

Table 2: For attitude, the following scale was used to interpret the respondents' options:

Scale Value	Category
2.35 – 3.00	Favorable attitude
1.68 – 2.34	Moderately favorable attitude
1.00 – 1.67	Unfavorable attitude

III. RESULTS AND DISCUSSION

A. Students Personal Variables

Table 2: Academic performance of respondents in Math, Chemistry, and English

Academic Performance	Math		Chemistry		English	
	f	%	f	%	f	%
High	8	3.28	9	3.69	16	6.56
Average	110	45.08	125	51.23	161	65.98
Low	126	51.64	110	45.08	67	27.46
Total	244	100.00	244	100.00	244	100.00

The table above shows the distribution of respondents according to their academic performances in Math, Chemistry, and English. It is revealed that most of the respondents obtained low performance with the frequency of 126 or 51.64 percent in Math. It was noted that majority of the respondents, 125 or 51.23 percent and 161 or 65.98 percent, obtained the average performance in Chemistry and English respectively.

B. Attitude towards Chemistry

Table 3: Distribution of respondents according to their attitude scores

Descriptors	f	%
Favorable attitude	44	18.03
Moderately favorable attitude	165	67.62
Unfavorable attitude	35	14.35
Total	244	100.00

Forty-four or 18.03 percent of the respondents have favorable attitude towards chemistry. The majority, 165 respondents or 67.62 percent possessed moderately favorable attitude while 35 or 14.34 percent had unfavorable attitude. It is revealed that the general weighted mean of 2.0524 falls under the moderately favorable level of attitude. This implies that students have moderately favorable attitude towards chemistry subject.

C. Relationship of Attitude and Performance of Students in Math, Chemistry, and English

Table 4: Relationship between cognitive performance and selected variables

Variables	Computed r- value	Statistical Inference
Attitude towards chemistry	0.583	Significant at 0.01

Math Performance	0.028	Not Significant
Chemistry performance	-0.330	Significant at 0.01
English Performance	-0.101	Not Significant

df = 243

The table shows that the respondents' attitude towards chemistry is significantly related to the result of their cognitive performance at 0.01 level. This implies that those with favorable attitude towards chemistry get higher scores in the cognitive tests. Chemistry performance of the respondents during the semester is also significantly related to their cognitive performance. This means that those who have better knowledge in chemistry obtained higher score in the cognitive test.

One of the factors to students' success is the students' attitude in learning. (Farhana WanYunus, 2012). Akey (2006) also agreed that the attitude of students can contribute to their academic achievement in chemistry.

IV. CONCLUSION

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

1. The students' level of cognitive performance is significantly related to their attitude towards chemistry and their performance in chemistry.

V. RECOMMENDATION

The following recommendations are put forward based on the findings:

1. Chemistry teachers should emphasize the difficult concepts and skills of cognition.
2. Students must be taught "to be active strategic learner". Analytical and critical approach to chemistry learning should be emphasized in the classroom.
3. Teachers should device a strategy to develop positive attitude towards chemistry that would likely result to achieving better performance.

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