Factors Affecting the Achievement Level in Biological Science of the Students in the University of Eastern Philippines

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Abstract

This study employed the descriptive method of research to describe the achievement level in Biological Science in the areas of cells, tissues and organs among the college students of the University of Eastern Philippines. Using a researcher-made questionnaire, data were collected from students of the College of Science and College of Arts and Communication. Data on gender, socio-economic status, type of high school graduated from, attitude towards Biology were drawn from the respondents.

The analysis and interpretation of the gathered data were carried out using frequency, percentage and mean. The multiple regression analysis was also used to determine the significant relationship of the achievement level in Biological Science and the independent variables.

The findings revealed that majority of the respondents of this study were female; most of the respondents parents were college graduates; majority of the fathers were working as government employees but most of the mothers were not working and were plain housewives; the respondents parents' monthly income ranged from Php1,000 to 5,000; the students obtained scores considered Failure in the achievement test in Biological Science; and, generally, the respondents' attitude towards Biology was "Undecided".

The multiple regression analysis showed that there is a significant relationship between the achievement level in Biological Science and the profile of the student-respondent's gender, mother's educational attainment, father's occupation and monthly family income, further revealed that there is no significant relationship between the achievement level in biological science and type of high school where they graduated, father's educational attainment and mother's occupation.

Keywords: Achievement, Biological Science, Attitude

Introduction

Biological Science is a subject offered to non-science major students in the college level as a requirement of the courses they are enrolled in. In this curricular subject, the students are expected to learn the basic knowledge about life and its components.

Today, people live in a science-conscious age. Radio and television advertise products that are the results of scientific researches. The news and media outlets deal everyday with some developments in space science, medical and agricultural sciences, and others. Even the President and Congress of the Philippines have employed the services of advisers on science. Countries spend millions of dollars on scientific researches and development for financial stability. However, there is a surprising lack of understanding and comprehension on what science is (Lopez, 2000).

Some view science as akin to magic, relentless mathematical games and there are those who feel that science should be able to provide definite solutions to all the problems of modern life from water and air pollution to shortage of energy and to the ravages of cancer. Keeton (1983), however, regards science with anxious suspicion as a threat to humane existence.

The threshold of the 21st century is characterized by rapid economic growth and technological changes. This era is expected to be marked by great changes in the development and delivery of learning and knowledge systems. It is a century that will lean heavily on science and technology (Fanega, 2001).

In recognition of the role of science and technology in development, Article XIV, Section 10 of the 1987 Philippine Constitution mandates, among others, that science and technology education are essential for development, invention, innovation, training, and services. It shall support indigenous, appropriate, and self-reliant scientific and technological capabilities and their application to the country's productive system and national life.

The Department of Science and Technology (DOST), as the premiere science and technology body in the country, under Executive Order No. 128, is likewise charged with the twin mandate of providing central direction, leadership and coordination of all scientific and technological activities, and of formulating policies, programs, and projects to support national development. The Science Department is further tasked to continuously review the state and needs of science and technology in the context of the country's development goals.

The Department of Education (DepEd), being one of the potent agencies of the government in initiating changes through the learning institutions, believes that education should emphasize more on science and technology, culture and history, and a balance of language and values education. Scientific literacy should be emphasized as an important requirement for individuals to live productive lives. Science education is everybody's business, therefore, it should be given to all, and that it should happen in the classroom.

The school must assume a large share of responsibility for developing scientific attitudes and behavior in students. As an instrument for dissemination of scientific

knowledge, it should take a decisive stride in giving and providing incentives for the development of scientific attitudes, habits and skills, knowledge and appreciation, and enthusiasm among the students.

Knowledge should be attuned and be more responsive to the felt needs of the times. Students need to learn how to take full advantage of the benefits provided by science and technology through the curriculum implementers.

The present science education program is generally geared towards the vertical ladder form of teaching, that is, developing science experiences from one level, which builds on those preceding ones. These provide connecting link to those in the succeeding level. Instruction in science is intended to provide a continuity and variety of experiences in order to help students to grow along with their expanding environment. This may lead to the pursuit of science as a career.

To attain the objectives of science instruction in all schools, science educators, administrators of science programs, and science specialists must pool together all their efforts in order to come up with new set of goals for science teachers in all levels. The overarching goal of science is to produce science literate individuals who can think and act objectively and scientifically to things in their environment, who can employ scientific procedures in searching for ideas and who can exhibit values, appreciations and interests important to their personal and social life. Hence, teachers should realize that their effectiveness depends on how well they can foster a favorable attitude towards the subject.

According to Keeton, Biological Science can and should be one of the most stimulating subject in college, after all, it has such an immediate personal relevance as the phenomena of life. Being a study of life, Biological Science sheds light on what every individual experiences in himself/herself and by observers around him/her.

The role and the study of biology in the country is very vital in order to achieve better changes. Making Biology as a required subject in college is a way of helping the students understand important scientific biological concepts and its relationship which enable them to apply and control the things that surround them.

DECS Order No. 111, s. 89 on Policies and Standards for Basic Sciences states that the basic science program shall aim at providing the country's future generation of scientists, researchers, teachers, engineers, and other professionals with substantial training in the fields of biology, chemistry, mathematics and physics.

This policy statement had motivated the researcher to conduct a study along the area of science and technology to determine the achievement level in Biological Science and the factors that influence the achievement of the selected college students of the University of Eastern Philippines, University Town, Northern Samar.
Furthermore, the result of this study would probably answer if there is a need of experiential learning in Biological Science subject specifically to non-science major students.

Statement of the Problem

The main purpose of this research study was to determine the factors affecting the achievement level in biological science of college students in the University of Eastern Philippines during the second semester of school year 2008-2009.

Specifically, it answered the following problems:

1. What is the profile of the college students of the University of Eastern Philippines in terms of: gender; socioeconomic status of the parents: parents' occupation, educational attainment, monthly income; Program enrolled in; and type of high school where they graduated from?
2. What is the attitude towards Biology of the students?
3. What is the achievement level in Biological Science of the students?

Hypothesis

This research sought to test the null hypothesis "that the factors are not a predictor of the achievement level in Biological Science of the students."

Research Design

To achieve the purpose of this research study, a descriptive-survey method was used through an achievement test in Biology which was administered to the students of the College of Science and College of Arts and Communication of the University of Eastern Philippines, during the second semester of SY 2008-2009.

This method was deemed fit for use in studies like this which gathered data and information through the use of questionnaires which were analyzed and interpreted. To be able to determine the achievement level of the students in the aforementioned subject, the justification on the use of the descriptive method in this study lies in the intention of the researcher to describe the achievement level in biological science of the college students.

Locale and Population of the Study

This study was conducted in the University of Eastern Philippines, University Town, Northern Samar. This university is located in Catarman, Northern Samar, on the northernmost portion of the Samar Island. This institution of higher learning was first opened in 1918 as the Catarman Farm School and became the Catarman National High School in 1951. The school was converted into the Samar Institute of Technology (SIT) which started to offer degree programs in Agricultural Technology, Teacher Education, Industrial Technology, Farm Mechanics, Secondary Vocational Curriculum, and other short courses.

On January 27, 1964 by virtue of Republic Act No. 4126, SIT was finally converted into the University of Eastern Philippines. Under its University status, there has been a dramatic increase in the number of academic program offerings not only in the undergraduate but in the graduate level as well (UEP Annual Report, 2000).

The University offers 49 undergraduate programs, 26 graduate programs, and 11 non-degree courses, not to mention the elementary and secondary schools which are used as laboratories for the teacher education programs of the University.

The population of this study was composed of 130 first year and second year students from the College of Science and College of Arts and Communications in the University of Eastern Philippines, University Town, Northern Samar. The respondents were bonafide students who were officially enrolled in the Biological Science subject during the Second Semester, school year 2008-2009. Further, the student-respondents were non-repeaters of the subject. Repeaters of the subject were not included in this study in order that the student-respondents will have uniform level of knowledge/know-how about the subject, Biological Science. The selection of the courses and year level of the respondents was based on the decision of the researcher.

Sampling Technique

In order that the population would be represented completely, the researcher involved all the students enrolled in the natural science subject under the class of the researcher herself. It utilized the purposive sampling, that is, utilizing a subgroup of the population of students of the College of Science and College of Arts and Communication.

Research Instrument

There were three sets of research instruments used for the purpose of gathering data and information needed for this study.

The first set of questionnaire was distributed to the student-respondents to determine their profile on their gender, type of high school graduated from and socioeconomic status of the parents.

The second set was the Attitude Towards Biology Survey Form patterned and modified by the researcher from the study of Quinones (1997). This was administered to determine student's attitude towards Biology.

The third set was a 60-item, multiple choice type of Achievement Test in Biology adopted and modified from the study of Lopez (2000). There were 20 questions each of the topics on cell, tissue and organ system.

Data Gathering Procedure

The questionnaire was the main instrument used in gathering the pertinent data of the study.

Permission was cordially asked by the researcher from the Deans of the College of Science and the College of Arts and Communication to conduct an achievement test in Biology to all the students enrolled in Biological Science subject under the researcher herself.

Upon the approval of the College Deans, the researcher personally administered the achievement test to the actual respondents of this study during the 2nd semester final examinations last March 13, 2009 at the UEP Old Engineering Building.

For uniformity in the giving of instructions and directions, the researcher personally administered the questionnaires to the respondents. A time was set for answering the achievement test after which they were collected for checking which was done by the researcher.

The researcher used a teacher-made achievement test to determine the achievement level of the college students of the University of Eastern Philippines specifically from the College of Science and College of Arts and Communication. It was subjected to item analysis after the pre-test for validation purposes.

Statistical Treatment of Data

To interpret the data gathered, the researcher employed simple statistics such as frequency and percentage distribution of the respondents according to some specific variables. The mean was used to measure the central tendency while the multiple regression analysis was used to test the relationship between the dependent and independent variables.

Table 1
Frequency Distribution of the Respondents According to Gender

Sex	F	%
Male	43	33.08
Female	87	66.92
Total	**130**	**100**

Gender.

Shown in Table 1 is the distribution of the respondents' gender. It appeared that 87 or 66.92 percent were female and 43 or 33.08 percent were male. This indicates that majority of the student-respondents were female.

This confirms Lopez's findings that majority of the respondents were females. This implies that female always dominate the male.

Table 2
Frequency Distribution of Respondents According to Program Enrolled In

Program Enrolled In	f	%
B.S. Information Technology	39	30
B.S. Mathematics	26	20
B.S. Chemistry	20	15.38
B.A. Major in Political Science	20	15.38
B.A. Major in Language and Literature Teaching	25	19.23
TOTAL	**130**	**100**

Program Enrolled In.

Table 2 showed the distribution of respondents according to program enrolled in.

Out of 130 respondents, 39 or 30 percent were B.S. Information Technology students, 26 or 20 percent were B.S. in Mathematics students, 25 or B.A. major in Language and Literature Teaching students, and 20 or 15.38 percent were B.S. Chemistry students and B.A. Major in Political Science students, respectively.

The data informed us that majority of the students were enrolled in information technology.

Table 3
Frequency Distribution of Respondents According to Type of High School Where Graduated

Type of High School	f	%
Public	105	80.77
Private	25	19.23
TOTAL	**130**	**100**

Type High School Graduated.

Table 3 shows where the respondents graduated from high school. Out of 130 respondents, one hundred five or 80.77 percent graduated from the public high schools and only 25 or 19.23 percent of the respondents where from the private schools. The data confirmed Lopez's study that majority of the respondents graduated from public high schools.

Table 4
Frequency Distribution of the Respondents According to the Parents' Educational Attainment

Educational Attainment	Father	%	Mother	%	Total	
					f	%
No Education	3	2.31	1	0.77	4	3.08
Elementary Undergraduate	14	10.77	5	3.85	19	14.62
Elementary Graduate	14	10.77	9	6.92	23	17.69
High School Undergraduate	14	10.77	17	13.08	31	23.85
High School Graduate	19	14.62	26	20	45	34.62
College Undergraduate	24	18.46	30	23.07	54	41.54
College Graduate	37	28.46	36	27.69	73	56.15
Master's Level	5	3.84	5	3.85	10	7.69
Doctoral Level	0	0	1	0.77	1	0.78
Total	**130**	**100**	**130**	**100**	**260**	**100**

The distribution of respondents according to educational attainment is shown in Table 3. Seventy-three or 56.15 percent were college graduates; 54 or 41.54 percent were college undergraduates; 45 or 34.62 percent were high school graduates; 31 or 23.85 percent high school undergraduates; 23 or 17.69 percent elementary graduates; 19 or 14.62 percent were elementary undergraduates; and, 4 or 3.08 percent had no education at all. Out of 130 respondents, 10 or 7.69 percent of their parents were master's degree holders; and 1 or 0.78 percent had embarked on her doctorate.

These findings confirm Francisco's findings which disclosed that majority of the fathers and mothers were college graduates. Evidently, the predominance of the parents who were college graduates and undergraduates, respectively. At the extreme ends of the continuum were the parents who had no education at all and those with doctoral studies.

Table 5
Frequency Distribution of the Respondents According to the Parents' Occupation

Parents' Occupation	Father	%	Mother	%	Total	%
Government Employee	34	26.15	27	20.77	61	23.46
Farmer	30	23.08	0	0	30	11.54
OFW	2	1.54	0	0	2	0.77
Self-Employed	38	29.23	15	11.54	53	20.38
Housewife/Housekeeper	0	0	75	57.69	75	28.85
None	26	20	13	10	39	15
Total	**100**	**100**	**130**	**100**	**260**	**100**

Table 5 shows the distribution of the parents' occupation of the respondents.

Thirty-eight or 29.23 percent of the respondents' fathers were self-employed; 34 or 26.15 percent were government employees; 30 or 23.08 percent were farmers; 2 or 1.54 percent were OFWs; and 26 or 20 percent either do not have work and or deceased.

Out of 130 mothers of the respondents, 75 or 57.69 percent were housewives and/or housekeepers; 27 or 20.77 percent were government employees; 15 or 11.54 percent were self-employed; and only 13 or 10 percent do not have any work at all and/or deceased.

The overall results showed that 75 or 28.85 percent were just housewives or housekeepers; 61 or 23.46 percent were working as government employees; 53 or 20.38 percent were self-employed; 30 or 11.54 were working as farmers; and only 2 or 0.77 percent were working as OFWs.

The data presented in Table 5 is an evidence that majority of the parents were housewives and government employees.

Table 6
Frequency Distribution of Respondents Parents' Monthly Income

Parents' Monthly Income	F	%
₱ 1,000 – 5,000	43	33.08
₱ 5,001 – 10,000	41	31.54
₱ 10,001 – 15,000	27	20.77
₱ 15,001 – 20,000	11	8.46
Over ₱ 20,000	8	6.15
Total	**130**	**100**

Parents' Monthly Income.

Out of 130 respondents, 43 or 33.08 percent had an income between Php 1,000 – 5,000 per month; 41 or 31.54 had an income between Php 5,001 - 10,000; 27 or 20.77 had an income of Php10,001 – 15,000; 11 or 8.46 percent had an income of Php 15,001 –20,000; and, only 8 or 6.15 percent earns over Php20,000 per month.

These findings disconfirmed Francisco's findings which claimed that majority of the students belong to the family income bracket of Php 5,001 – Php10,000 per month.

Table 7
Frequency Distribution of Respondents' Achievement Test Results

Test Result	Male	%	Female	%	Total	%
36 – 39 (Fair)	0	0	1	1.136	1	0.77
30 – 35 (Poor)	7	16.67	13	14.77	20	15.38
29 Below (Failure)	35	83.33	74	84.09	109	83.85
Total	**42**	**100**	**88**	**100**	**130**	**100**

Table 7 shows the achievement test results of the respondents. Thirty-five or 83.33 percent of the male-respondents got a score 29 below or failure and 7 or 16.67 percent got a score 30-35 or poor, while 74 or 84.09 percent of the female-respondents got a score of 29 below or failure; 13 or 14.77 percent got 30-35 or poor results; and only 1 or 1.136 percent got a score of 36 or fair.

The overall results show that 109 or 83.85 percent of all the respondents got a score 29 below or failure; 20 or 15.38 percent 30-35 or poor test results; and only 1 or 0.77 percent of the respondent got a score of 36 or fair result. The findings confirmed the research findings of Lopez which stated that the students obtained scores considered failure in the achievement test in Biological Science.

It also confirmed Lanuza's findings which said that there was no significant difference between the achievement of male and female students in Biology.

Table 8
Attitude of the Student-Respondents Towards Biology

STATEMENTS	SA	A	U	D	SD	Total	Weighted Mean	Interpretation	Rank
1. Biology is very interesting subject.	36	74	20	0	0	130	4.12	A	1
2. I enjoy Biology class more than any other.	15	70	40	5	0	130	3.73	A	6
3. Biology trains me to discipline.	24	74	23	9	0	130	3.87	A	3
4. I am afraid to take Biology course.	5	24	48	27	26	130	2.65	U	14
5. Biology makes me think logically.	13	73	30	10	4	130	3.62	A	8
6. Life can go without Biology.	12	17	26	42	33	130	2.48	D	16
7. I am very attentive in my Biology class.	12	72	30	16	0	130	3.62	A	8.5
8. I have always enjoyed studying Biology in school.	15	67	38	10	0	130	3.67	A	7
9. In general, I have a good feeling toward Biology.	16	70	43	1	0	130	3.77	A	4
10. I approached Biology with a feeling of hesitation.	4	30	57	29	10	130	2.92	U	13
11. Biology makes me feel uncomfortable, restless, irritable and impatient.	7	17	30	49	27	130	2.45	D	17
12. I really like Biology	16	63	43	8	0	130	3.67	A	7.5
13. I feel at ease in Biology and like it very much.	9	67	42	10	2	130	3.55	A	10
14. Biology is challenging.	31	71	26	2	0	130	4.01	A	2
15. Biology is my favourite subject.	9	44	62	14	1	130	3.35	A	11
16. When I hear the word Biology, I have a feeling of hesitation.	0	23	48	47	12	130	2.63	U	15
17. I don't make my assignment in Biology.	2	11	22	46	49	130	1.77	D	18
18. Biology makes me feel secure, and at the same time it is stimulating.	14	56	51	9	0	130	3.58	A	9
19. I should always come prepared on my biology class.	18	69	30	11	2	130	3.69	A	5
20. I love Biology subject than other subjects.	5	50	54	20	1	130	3.29	U	12
AVERAGE MEAN							**3.322**	**U**	

Legend:	Scale Value	Interpretation
	4.51 – 5.00	Strongly Agree
	3.51 – 4.50	Agree
	2.51 – 3.50	Uncertain
	1.51 – 2.50	Disagree
	1.00 – 1.50	Strongly Disagree

The attitude statements toward the subject Biology which the students expressed agreement on were as follows: Biology is a very interesting subject, rank 1; Biology is challenging, rank 2: Biology trains me to discipline; I have a good feeling towards Biology, rank 4: I should always come prepared for my Biology class, rank 5.

The overall interpretation of the student-respondents' attitude toward Biology is that they have a favourable attitude toward the subject. But taking the weighted means for all the 20 attitude statements, it was revealed that the average mean was 3.332 interpreted as "u" or "undecided."

It can then be inferred that studying Biology on the part of the students was not a problem because of their evident interest and positive attitude toward the subject. Likewise, teaching on the part of the teachers will not also be a problem because of the favourable attitude of the students toward the subject.

Test of Relationship Between the Achievement Level in Biological Science and Independent Variables

Table 8 is the summary of the test of relationship between the dependent variable (Achievement Level in Biology) and the profile of the student-respondents.

Gender.
The findings revealed that the F ratio of gender is 0.8309 which is greater than the significant F which is 0.3637. Hence, gender is significantly related to the achievement level in Biological Science. Thus, the null hypothesis is rejected.

Type of High School Where Graduated.
The findings revealed that the F ratio of type of high school where graduated is 0.2059 is less than the significant F of 0.6507. Thus, type of high school where graduated is not related to the achievement level in Biological Science. This means that type of high school where graduated is not a factor to awareness. Whether one is from public or private schools, their achievement level in Biological Science is similar. The null hypothesis is accepted.

Father's Educational Attainment.
The findings revealed that the F ratio of the father's educational attainment is 0.0269 which is less than the significant F ratio of 0.8699. It means that the fathers' educational attainment is not significantly related to the achievement level in Biological Science. Thus, the null hypothesis is accepted.

Mother's Educational Attainment.
The findings revealed that the F ratio of the mother's educational attainment is 0.7084 which is greater than the significant F ratio of 0.4015. It means that the mothers'

educational attainment is significantly related to the achievement level in Biological Science. Thus, the null hypothesis is rejected.

Fathers' Occupation.
Result of the study revealed that the F ratio of fathers' occupation is 7.733 which is greater than its significant F of 0.0062, hence it is significantly related to the achievement level in Biological Science. This means that the null hypothesis of there is no significant relationship between the fathers' occupation is rejected.

Mothers' Occupation.
It was found out that the F ratio of mothers' occupation is 0.2163 which is less than the significant F of 0.6426. Hence, it implies that the achievement level in Biological Science is not significantly related to the mothers' occupation. This means that the null hypothesis of there is no significant relationship between the fathers' occupation is accepted.

Monthly Income.
The F ratio of the monthly family income is 0.5966 which is greater than the significant F of 0.4412. It means that the monthly family income has a significant relationship with the achievement level in Biological Science. The null hypothesis is rejected.

Table 9
Test of Relationship Between the Achievement Level in Biological Science and the Independent Variables

Independent Variables		F-Ratio	Significant F	Interpretation
Gender	x1	0.8309	0.3637	Significant
Type of High School Where Graduated	x2	0.2059	0.6507	Not Significant
Fathers' Educational Attainment	x3	0.0269	0.8699	Not Significant
Mothers' Educational Attainment	x4	0.7084	0.4015	Significant
Fathers' Occupation	x5	7.733	0.0062	Significant
Mothers' Occupation	x6	0.2163	0.6426	Not Significant
Monthly Income	x7	0.5966	0.4412	Significant

Summary

This study employed the descriptive method of research to describe the achievement level in Biological Science in the areas of cells, tissues and organs among the college students of the University of Eastern Philippines. Using a researcher-made questionnaire, data were collected from students of the College of Science and College of Arts and Communication. Data on gender, socio-economic status, type of high school graduated from, attitude towards Biology were likewise drawn from the respondents.

The analysis and interpretation of the gathered data were carried out using frequency, percentage and mean. The multiple regression analysis was also used to determine the significant relationship of the achievement level in Biological Science and the independent variables.

The findings revealed that majority of the respondents of this study were female; most of the respondents parents were college graduates; majority of the fathers were working as government employees but most of the mothers were not working and were plain housewives; the respondents parents' monthly income ranged from Php1,000 to 5,000 per month; the students obtained scores considered Failure in the achievement test in Biological Science; and, generally, the respondents' attitude towards Biology was "Undecided"; the test of relationship between the achievement level in Biological Science and the profile of the student-respondents revealed that gender, mother's educational attainment, father's occupation and monthly family income were significantly related; and there is no significant relationship between the achievement level in biological science and type of high school where they graduated, father's educational attainment and mother's occupation.

Conclusions:

Based on the foregoing findings, the following conclusions were drawn:

1. Majority of the student-respondents were female and were not able to achieve the 75% desired mastery level in Biological Science;

2. Most of the student-respondents parents were college graduates, their fathers are working as government employees and most of their mothers were housewives, with a monthly family income of Php1,000-5,000 only because most of their salary goes to their loans in the banks;

3. There was a significant relationship between the achievement level in biological science and gender, mother's educational attainment, father's occupation and monthly family income were significantly related;

4. There is no significant relationship between the achievement level in biological science and type of high school where graduated, father's educational attainment and mother's occupation.

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