

Attributions of Academic Performance among Third Year and Fourth Year Biology Major Students

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Abstract

This is a non-experimental, cross sectional comparative study aimed to determine the attributions of academic performance of third year and fourth year biology major students in the College of Education of West Visayas State University in Philippines. The academic performance of the students were measured in terms of test, projects, workbooks, and laboratory experiments, class participation, and attendance. The researcher made closed-form questionnaire checklist that was categorized in terms of the ability, the effort, luck or the task difficulty was use to evaluate the attribution in academic performance of the students. In order to determine if there were significant difference in the attribution of the students when they were taken according to their year level, the mean frequency, mean percentage, Mann-Whitney U-test, two-sampled test set at 0.05 level of significance were employed. The result of the study revealed that the Third Year biology major students attributed their academic performance to effort which was shown to have the highest percentage attribution and luck which was shown to have the least percentage attribution in the overall rank. The result revealed further, that there was a significant difference in the attributions of academic performance for third year and fourth year biology major students in terms of test, while the results for projects, workbooks and laboratory experiment and class participation and attendance categories was found out to have a significant difference in the attribution for the academic performance of the third and fourth year biology major students.

Keywords: Attributions; Academic performance; Biology

Introduction

The academic achievements of the students are believed to be greatly influence by the probability and causes of their success and failure [1,2]. Banks and Woolfson [3] further explain that, an attributions can have a significant effect on academic achievement of students especially with those experiencing learning difficulties thus, these students will more likely to display negative attributions than their peers. Mahboudi M [4] suggested that "Causal Attribution" is being one of the motivation theories manipulating the realization of decisions. In this process, the individuals try to decide on the causal factors of an event or consequence. This individual's response to a certain event is dependent on their interpretation of that event. He added also that, facilitating events prediction and control, the attributions explain the sensations, attitudes and behaviours and not only affect emotions but also manipulate individual's function.

Rania N et al. [5] emphasized that the academic performance of the students can be influenced through ecological perspective, interpersonal relationship of social contexts and environmental conditions. Rania N further added that according to ecological model the students' degree programme or a different year level can affect academic performance, wellbeing, self-esteem and perceived climate.

Cooper and Burger [6] that, Weiner et al. [7] suggested that four attribution categories (ability, task difficulty, effort, and luck) are "the most common and general of the perceived causes of success and failure" [8]. Two dimensions were said to underlie these categories: internal (ability, effort) versus external (task, luck) and stable (ability, task) versus unstable (effort, luck). Empirical studies supporting this conceptualization have frequently been reported [9,10]. Other research [6,11-13] indicates that beliefs about personal efficacy may be important in determining behavior. In relation to this, Dinah concluded that, availability of text books, laboratory apparatus and other learning resources contribute significantly to the performance of students in Biology examination. He added that, students with positive attitude

towards the subject register better performance than those who had a negative attitude. Those with positive attitude are motivates to work hard and this is reflected in the good marks scored in the examination.

However, a student who fails in the learning field is disappointed and dissatisfied. In the College of Education, it is noticed that there are few biology major students who belong to the academic awardees or even in the Dean's list, Thus, this study attempted to find out to what factors do Third year and Fourth year students majoring in biology at the College of Education, West Visayas State University attribute their academic performance. This potent, cogent but rather confusing subject deserves some elucidation. It is against this background that the researcher picks up the challenge and seeks to provide empirical solutions to this pressing issue especially by obtaining information from nature subjects.

Review of the Literature

According to Weiner [14], people make causal explanations by answering questions beginning with "Why?" This attribution theory was developed within social psychology as a means of dealing with questions of social perception. Furthermore, he added that people try to determine why people do what they do, i.e., attribute causes to behavior. Forming attributions can only then explain a behavior or an

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event [15]. An attribution has two primary meanings. The first refers to explanations of behavior and it usually answers to why questions while, the second one refers to inferences or ascriptions such as inferring traits from behaviour or ascribing blame to a person. The common meanings between the two are the process of assigning an attribution as an explanation to behaviour was assigned to its cause. However, in attribution as inference, a quality or attribute is assigned to the agent on the basis of an observed behaviour.

The behaviour and attitude of group members or of the students was also affected by the climate of the organizations or of the school. Thus academic performance of the students was also affected. Loukas and Murphy further explained that, climate includes atmosphere, culture, values, resources, social networks as well as interpersonal and instructional dimensions of the organizations. School climate is a complex construct used wherein the characteristics of interactions between adults and students in school was described.

Graham S [16] use attribution theory to understand social & academic motivation in Black youth Principles from attribution theory concerned with perceived responsibility in self and others are used as a conceptual framework for examining social motivation such as peer-directed aggression and academic motivation that could be achievement values in African American youth. Choi added that growing cross cultural evidence suggests that East Asians are less likely to show the correspondence bias, or a preference for explanations of behavior in terms of traits, dispositions, or other internal attributes of the target. However, it appears not to be caused by an absence of dispositional thinking in East Asian cultures. Indeed, extensive ethnographic and psychological data indicate that “dispositionism” is a cross-culturally widespread mode of thinking, although East Asians believe dispositions to be more malleable and have a more holistic conception of the person as being situated in a broad social context. The East–West split in attribution thus originates primarily from a stronger “situationism” or belief in the importance of the context of behavior in East Asia. Consequently, East Asians are more likely than Western people to avoid the correspondence bias as long as situational constraints are salient.

In the study conducted by Pekrun R et al. [17] that academic emotions are significantly related to students’ motivation, learning strategies, cognitive resources, self-regulation, and academic achievement, academic emotions also affects their personality and classroom antecedents. Emotional diversity in academic settings should be acknowledged in order to address the full range of emotions experienced by students at school and in university.

Weinburg M et al. found out in their study that gender have a significant effect on attitudes with females having more positive attitudes toward biology laboratory attitudes than males. Prior academic experiences was also considered a significant predictors of attitudes; students who received lower General Point Average or GPAs in previous science courses have more positive attitudes towards biology laboratory compared with the students with higher General Point Average or GPAs. Yumusak N et al. [18], explained it further, that extrinsic goal orientation, task value, rehearsal strategy use, organization strategy use, management of time and study environment, and peer learning contributed significantly to the prediction of achievement scores in biology among students..

Objectives of The Study

The purpose of this study was ascertaining the attributions of

academic performance among biology major students in the third and fourth year level at the College of Education, West Visayas State University. More specifically, it attempted to determine what do students attribute their academic performance as measured by test, projects, workbooks, laboratory experiments, class participation, and attendance when classified by year level and when taken as an entire group; and test the difference in the attribution when the students were taken according to their year level.

Statement of the problem

The purpose of this study was to ascertain the attributions of academic performance of third year and fourth year biology major students.

More specifically, it attempted to provide answers to the following questions:

1. To what do students attribute their academic performances as measured by test, projects, workbooks, laboratory experiments, class participation and attendance when classified by year level and when taken as an entire group?
2. Is there a significant difference in the attribution when the students were taken according to their year level?

Statement of the hypothesis

1. The Biology major students on their third and fourth years rely on their best efforts and abilities in the accomplishment of their academic tasks.
2. There is no significant difference in the attribution when the students were taken according to their year level.

Methodology

Design

Since the purpose of this study was to look into the attributions of academic performance among the third and fourth year biology major students of the College of Education, West Visayas State University, the non-experimental, cross sectional comparative method was used. Non experimental, descriptive method according to Padua may be described as current existing characteristics such as achievement, attitudes, relationships, etc. He further added that, a cross sectional comparative method can be known also as a cross-sectional analysis, transversal study or prevalence study. This will be use to described as a type of observational study that involves the analysis of data collected from a population, or a representative subset, at one specific point in time. Employing this method usually has its objective to describe a situation as it exists at the time of the study.

Population

The target population for this study consists of undergraduate biology major students. Specifically the students who were in their third year and fourth years in college. These students could hardly get or vying into honors rolls and even into dean’s list.

Sample or Sampling Procedure

The respondents or subjects of this study were the 23 or the entire third year and 20 or the entire fourth year biology major students, at the College of Education, West Visayas State University. The age range of these respondents is 20-21 years old. They were all selected as respondents or subjects. The researcher employed the purposive sampling technique.

Instrumentation

The researcher-made closed-form questionnaire-checklist was composed of 25-item tasks in the academic performance.

This was divided into three categories or sources of academic performance: first, the 1-10 item for test; second, the 11-20 item for projects, workbooks and laboratory experiments, and third, the 21-25 item for class participation and attendance. The respondents were to check whether they attribute these tasks or categories of academic performance on ability, effort, luck, or task difficulty. Two professors teaching psychology and three professors teaching biology of the university corrected the researcher-made close form questionnaire. In the same university the researcher-made closed-form questionnaire was trial tested on a normative sample (N=20) selected from another year level but on the same major (first and second year biology major students). The instrument yielded 0.71 on Cronbach alpha and when subjected to **Inter-Rater or Inter-Observer Reliability, it yielded 0.83 co efficient of reliability.**

Procedure

Phase I, Preparation of Instrument: The researchers made the instrument, a closed-form questionnaire checklist in order to gather the needed data. Five professors in this university who are experts in the field of biology and psychology validated this instrument. These five validators were all selected and sent an official letter requesting them to validate the said instrument.

Phase 2, Gathering of Validated Instruments: When the instruments were gathered from the five validators, the researchers combined all the critiques, but see to it that they did not collapse with each other. They were carefully and meticulously read, systematically followed, and returned to the research adviser for further comments.

Phase 3, Administration and Fielding of Instrument to the Respondents: The researchers went to the Office of the Dean of the College to ask the schedule of third year and fourth year biology major students in order to meet them and let answer the instrument. They administered it first to the fourth year and on the next day to the third year. But before the respondents answered the instrument, they were given a brief instruction regarding the instrument.

Phase 4, Tallying and Making Tables for the Result: After the instruments were gathered from the respondents, the researchers made a tally of answers for each student whether they answered ability, effort, luck, or task difficulty. The researchers made the tables categorized by test, projects, workbooks, laboratory experiments, class participation, and attendance, to answer the statement of the problem and/ or hypothesis.

Phase 5, Interpretation of Tables: The researchers interpreted the self-made tables categorized by test; projects, workbooks, laboratory experiments; class participation and attendance, in each of the year level

and used Maim-Whitney U statistics, a two sampled test to determine the significant difference set at 0.05 level of significance.

Phase 6, Data Analysis: The responses of students were tabulated by obtaining the mean frequency (f_{mean}) and mean percentage (%_{mean}) for every category of academic performance. To determine whether a significant difference in attribution exists between three categories as sources of academic performance, the Mann-Whitney U-Statistics was used set at 0.05 level of significance. Attributions were given points in analyzing the inferential statistics. The points were assigned reversely as to Ability - 4; Effort - 3; Luck - 2; and Task difficulty -1. In analyzing the Mann-Whitney U-statistics the answers of the students in each year level were tabulated. The researchers got the sum in each of the sources of academic performance as categorized by test, projects, workbooks, laboratory experiments, class participation, and attendance. After they were computed, the categories of the academic performance were compared if there is a difference in their attributions. The scores in the computation were used in the statistical inference, which is the Mann-Whitney U-test, set at 0.05 level of significance.

Results

In analyzing the Mann-Whitney U-Test two-sampled tests, set at 0.05 level of significance, there is only one part in order to determine the significant difference in the attribution when students were taken according to year level.

Table 1 presents the mean percentage of the attributions of academic performance of third year biology majors as categorized by test, projects, workbooks, laboratory experiments, class participation and attendance. The third year biology majors attributed their academic performance to effort which is shown to have the highest percentage attribution.

As shown in the table, the test performance, the highest attribution is effort with the mean percentage of (46.96%) next was ability (30.87%); then task difficulty (18.7%); finally luck (3.48%). However, in project, workbooks and laboratory experiments, they attributed it first to effort (61.74%); second – task difficulty (26.09%); third ability (10.44%); and finally luck (1.74%). While in class participation and attendance, they attributed it first to effort (36.52%); second – ability (22.61%); third – task (21.74%) and lastly, luck (19.13%).

When all the three sources of academic performance are taken, their overall academic performance have been attributed to 145.22% to effort, followed by task difficulty 66.53%, then ability 63.92% and lastly attributed to luck 24.35%. This implies that, the third year biology major students really use effort to perform well academically. It was found that the amount of effort that students exerted in their studies was positively associated with their academic performance.

Table 2 presents the mean percentage of the attributions of academic performance of fourth year biology majors as categorized by test, projects, workbooks, laboratory experiments, class participation and attendance.

Sources of Academic Performance	Attribution							
	Ability		Effort		Luck		Task Difficulty	
	f _{mean}	% _{mean}	f _{mean}	% _{mean}	f _{mean}	% _{mean}	f _{mean}	% _{mean}
Test	7.1	30.87%	10.8	46.96%	0.8	3.48%	43	18.7%
Projects, workbooks and Laboratory Experiments	2.4	10.44%	14.2	61.74%	0.4	1.74%	6	26.09%
Class Participation and Attendance	5.2	22.61%	8.4	36.52%	4.4	19.13%	5	21.74%
Over-all	14.7	63.92%	33.4	145.22%	5.6	24.35%	15.3	66.53%

Table 1: Attributions of academic performance of third year biology majors as categorized by test, projects, workbooks, laboratory experiments, class participation and attendance.

The fourth year biology majors attributed their academic performance to effort except for class participation and attendance for they were attributed to task difficulty which shows a small difference in the percentage mean of effort.

Table 2 shows the test performance, the highest attribution is effort with the mean percentage of (45%); next was ability (29%); then task difficulty (23%); and finally, luck (3%). However, in project, workbooks and laboratory experiments, they attributed it first effort (47.5%); second to ability (25%); third to task difficulty (24.5%). And finally, luck (3%). While in class participation and attendance, they attributed it first to task difficulty (36%); second to effort (35%); third to ability (18%) and lastly, luck (11%).

When all the three sources of academic performance were taken, their over-all academic performance has been attributed 127.5% to effort; 83.5% to task difficulty; 72% to ability 17% to luck. This implies that like the third year biology major students, the fourth year biology major students also attribute their academic performance to effort. They perform well academically if they also use effort.

Table 3 presents the mean percentage of the attributions of academic performance of third and fourth years biology majors as categorized by test, projects, workbooks, laboratory experiments, class participation and attendance. Both year levels attribute their academic performance to effort, which shows the highest percentage attribution.

In the test-performance, the highest attribution is effort with the mean percentage of (46.05%); next was ability (30%); then task difficulty (20.7%); and finally luck (3.26%). However, in project, workbooks, and laboratory experiments, they attributed it first to effort (55.12%); second to task difficulty (25.35%); third to ability (17.21%) and finally, luck (2.33%). While in class participation and attendance, they attributed it

first to effort (35.81%); second to task difficulty (28.37); third to ability (20.47%) and lastly, luck (15.35%).

When all the three sources of academic performance were taken, their over-all academic performance had been attributed 136.98% to effort; 74.42% to task difficulty; 67.68% to ability; and 20.94% to luck.

Table 4 shows that as an entire group, the biology majors in the third year and fourth year attributed their academic performance in their effort and they perceived luck as the last reason for achieving such performance. The third year, fourth year, and the entire group attributed their academic performance mostly to effort. Their least attribution was luck.

However if the attributions were categorized by year level it reveals that the third year biology major students assigned the effort as the highest attribution in test performance; next was ability; then task difficulty; finally to luck. It was found out further that, in project, workbooks and laboratory experiments, they attributed it first to effort; second – task difficulty; third ability; and finally luck. While in class participation and attendance, they attributed it first to effort; second – ability; third – task and lastly, luck.

On the other hand the fourth year biology major students revealed that they attributed their academic performance to the test performance, the highest attribution is effort; next was ability; then task difficulty; and finally, luck. However, in project, workbooks and laboratory experiments, they attributed it first effort; second to ability; third to task difficulty. And finally, luck. While in class participation and attendance, they attributed it first to task difficulty; second to effort; third to ability and lastly, luck.

When taken as an entire group, the biology majors in the third year and fourth year attributed their academic performance in terms

Sources of Academic Performance	Attribution							
	Ability		Effort		Luck		Task Difficulty	
	f _{mean}	% _{mean}	f _{mean}	% _{mean}	f _{mean}	% _{mean}	f _{mean}	% _{mean}
Test	5.8	29%	9	45%	0.6	3%	4.6	23%
Projects, Workbooks and Laboratory	5	25%	9.5	47.5%	0.6	3%	4.9	24.5%
Class Participation and Attendance	3.6	18%	7	35%	2.2	11%	7.2	36%
Over-all	14.4	72%	25.5	127.5%	3.40	17%	16.7	83.5%

Table 2: Attributions of academic performance of fourth year biology majors.

Sources of Academic Performance	Attribution							
	Ability		Effort		Luck		Task Difficulty	
	f _{mean}	% _{mean}	f _{mean}	% _{mean}	f _{mean}	% _{mean}	f _{mean}	% _{mean}
Test	12.9	30	19.8	46.05%	1.4	3.26%	8.9	20.7%
Projects, workbooks and Laboratory Experiments	7.4	17.21	23.7	55.12%	1	2.33%	10.9	25.35%
Class Participation and Attendance	8.8	20.47	15.4	35.81%	6.6	15.35%	12.2	28.37%
Over-all	29.1	67.68	58.9	136.98%	9.0	20.94%	30.0	74.42%

Table 3: attributions of academic performance of both year levels as categorized by test, projects, projects, workbooks, laboratory experiments, class participation and attendance.

Rank	Third Year			Fourth Year			Entire Group		
	Test	P, W and L.e	C.P and A	Test	P, W and L.e	C.P and A	Test	P, W and L.e	C.P and A
1	E	E	E	E	E	TD	E	E	E
2	A	TD	A	A	A	E	A	TD	TD
3	TD	A	TD	TD	TD	A	TD	A	A
4	L	L	L	L	L	L	L	L	L

P – Projects; W – Workbooks; Le – Laboratory experiments; CP – Class Participation; A – Attendance; A – Ability; E – Effort; L – Luck; TD – Task Difficulty

Table 4: Over-all view of ranked attributions according to year level as categorized by test, projects, workbooks, laboratory experiments, class participation, and attendance.

of test performance in their effort, followed by their ability, then the difficulty of the task and luck as they perceived it as the last reason. If it is in project, workbooks and laboratory experiments category, first in their effort, second to task difficulty, third to ability and they perceived luck as the last reason for achieving such performance. Like the result revealed in project, workbooks and laboratory experiments category, the class participation and attendance category shows that, first in their effort, next to task difficulty, then to ability and again they perceived luck as the last reason for achieving such performance. Crosnoe (2002) reported further that, the least persistent individuals were those who used attributions related to task difficulty and/or the lack of ability (external, uncontrollable, and stable). Conversely, those who used attributions related to a lack of effort (internal, controllable, and unstable) were most persistent.

Table 5 presents the ordinal rank of over-all view of Academic Performance According to Test, Projects, Workbooks, Laboratory Experiments, Class Participation, and Attendance. When categorized according to the three sources of academic performance, the third year, fourth year, and the entire group attributed mostly to effort while they considered luck as their least attribution in their academic performance.

Table 5 underscores that effort is the greatest factor in the academic performance of the students. This attribution is supported by the ability or the innate capability of the person. The difficulty of the task seemed to affect also their performance but they have considered luck as the last factor in their attribution of academic performance.

Based on Table 6, the researchers have the following observations: the greatest attribution of students is effort; their least attribution is luck. The third year, fourth year, and the entire group have the same attribution to their test. However, the third year, fourth year and the entire group alternated their attribution to the task difficulty and ability in the second and third rank for the project. The third year and the entire group have the same attributions for project. The third year and the entire group alternated their attributions to the task difficulty and ability in the second and third rank for class participation, and attendance. Finally, the fourth year and the entire group alternated their attributions to the task difficulty and ability in the first and second rank for project.

Farid, et al. [18] found similar patterns of success and failure attributions. Students documented their success attributions by quoting teacher influence, parent's influence, effort and strategy as prime causes of their success. This tells the importance of teacher and family in student's life. The students are still willing to give due credit to their

teachers and parents/family in country like Pakistan where social realities are changing.

Data shown in Table 6 presents the Statistical Analysis Using Mann-Whitney U-test in Test, Projects, Workbooks, Laboratory Experiments, Class Participation, and Attendance. Mann-Whitney U-test was employed in this study set at 0.05 level of significance. The z-value determines if the result of U-test is significant and the p-value as basis for 2-sample test.

Table 6 revealed the obtained Mann-Whitney U-test was employed in this study set at 0.05 level of significance. The z-value determines if the result of U-test is significant and the p-value as basis for 2-sample test.

The table shows the obtained z-value of -1.339 for test category with the p value of 0.181 which found out to be higher than the alpha level of 0.05. This implies that there is no significant difference in the attribution when the students were taken as an entire group in test category. In terms of Projects, Workbooks and Laboratory Experiments the obtained z-value is -2.217 with the corresponding p-value of 0.027. This implies that there is significant difference in the attribution when the students were taken as an entire group in Projects, Workbooks and Laboratory Experiments category. The Class Participation and Attendance categories obtained the z-value of -0.221 with the p-value of 0.825. This implies that there is no significant difference in the attribution of the students in The Class Participation and Attendance category. This is supported further by Weiner [14,20] using his more specific model and hypothesized that attribution or perceived causes of academic outcomes may influence achievement behaviors, expectancies and affects. If learners attribute success to external factors such as ease of the task, or attribute failure to internal factors such as inability, it will bring about negative effects to learners [20]. Therefore, the null hypotheses, which states that there is no significant difference in the attribution when the students were taken according to their year level in terms of test, class participation, and attendance was accepted. However, it was found out that their attribution of academic performance to projects, workbooks, and laboratory experiments significantly differed.

Conclusion and Recommendations

The hypothesis which states that there is no significant difference in the attribution when the students were taken according to their year level was accepted. The Biology major students on their third and fourth years rely on their best efforts and abilities in the accomplishment of their academic tasks. Thus, for one to succeed, dependence on the

Rank	Test			Projects, Workbooks and Laboratory Experiments			Class Participation and Attendance		
	3rd Year	4th Year	Entire Group	3rd Year	4th Year	Entire Group	3rd Year	4th Year	Entire Group
1	E	E	E	E	E	E	E	TD	E
2	A	A	A	A	A	TD	A	E	TD
3	TD	TD	TD	TD	TD	A	TD	A	A
4	L	L	L	L	L	L	L	L	L

A – Ability; E – Effort; L – Luck; TD – Task Difficulty

Table 5: Over-all view of ranked attributions of academic performance according to test, projects, workbooks, laboratory experiments, class participation, and attendance.

	Test	Projects, Workbooks and Laboratory Experiments	Class Participation and Attendance
Mann-Whitney U-test	175.500	140.500	221.000
z-value	-1.339	-2.217	-0.221
P (2-tailed asymp. Sig.)	0.181	0.027	0.825

Table 6: Result of statistical analysis using Mann-Whitney u-test in test, projects, workbooks, laboratory experiments, class participation, and attendance.

internal factors effectively influence empowered individuals which is much better than depending on external factors. According to Omrod [21]; when we attribute behaviors to factors outside ourselves, we are unlikely to change our behaviors in ways that will lead to greater success. And attributing behaviors within our control lead for improvement and for greater success. Thus, attribution-theory may be used as a good explanation in predicting and understanding past, present or future behaviors.

It is recommended that students should exert more effort and enhance their ability in order to cope up with science subject like Biology. Reading books and other reading materials pertinent to Biology during vacant periods and leisure time could help or remedy learning difficulties. Students should always view tasks as a challenge in learning and should be optimistic because these tasks could be a source of rich experience and knowledge. Administrators should develop educational plans that respond to the learning and changing needs of the students by exploring other sources of learning materials and conduct seminars about science education to facilitate additional learning for the student most especially on knowing the attributions of students in terms of academic performance. Teachers and parents should know to what their children attribute their learning and academic performance so they can provide necessary guidance and support. Finally, for future researchers, a similar study is recommended to include more factors, which are believed to be attributes to other aspects of academic performance and may cover other year levels in the college or university.

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