

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

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Abstract - This is a descriptive study aimed to determine the attributions of academic performance of third year and fourth year biology major students in the College of Education, West Visayas State University, School Year 2013-2014. The academic performance were categorized or measured in terms of test, projects, workbooks, and laboratory experiments, class participation, and attendance. The Attributions in academic performance were evaluated using the closed-form questionnaire-checklist, categorized into terms of ability, effort, luck, or task difficulty. Mean frequency, mean percentage, Mann-Whitney U-test, two-sampled test set at 0.05 level of significance were used to determine if there were significant difference in the attribution when the students were taken according to their year level. The result of the study revealed that the Third Year biology majors attributed their academic performance to effort which is shown to have the highest percentage attribution in overall rank. There was no significant difference in the attributions of academic performance for third year and fourth year biology major students in terms of test, while the result 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 third and fourth years biology Major students' academic performances.

Keywords: *Attributions, Academic Performance, Biology*

INTRODUCTION

Humans are an inquisitive species: We wonder why and how things occur, and we develop religions, philosophies, and sciences as ways of answering our questions. Such curiosity influences our cultural, societal, interpersonal, and personal lives in intricate ways. So fundamental is the process of asking and answering "why" questions—trying to figure out what caused something else—that it has been characterized as a basic human activity (Heider, 1958), and a family of theories has developed to illumine how and why things happen as they do. This set of theories, collectively called Attribution Theory, attempts to describe and explain the mental and communicative processes involved in everyday explanations, most typically explanations of individual and social events (Manusov & Spitzberg, 2008). Banks and Woolfson (2008) further added that attributions are the causal explanations that people assign to the events that happen to and around them.

Cooper and Burger (1980) that, Weiner et al. (1971) 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" (Weiner, 1977, p. 506). 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 (see Weiner 1976; Bartal, 1978). Other research (e.g., Bandura, 1977; Cooper, 1979; deCharms, 1968; Langer & Rodin, 1976) indicates that beliefs about personal efficacy may be important in determining behavior.

In relation to this, Dinah (2013) 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 motivated 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.

Theoretical Framework of the Study

According to Weiner (1989, people make causal explanations by answering questions beginning with "Why?" This attribution theory is 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 event (Kazdin, 2000). The attributions of third year and fourth year biology majors must be found out in order to discover or explain their academic performance.

Figure 1 shows the relationship between attributions of academic performance as measured by test, projects, workbooks, laboratory experiments, class participation and attendance among third year and fourth year biology major students.

OBJECTIVES OF THE STUDY

The purpose of this study was ascertain 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.

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.

METHODS

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 descriptive method was used. Descriptive method according to Padua (2000) may be described as present oriented studies. Employing this method usually has as its objective the description of a situation as it exists at the time of the study.

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. They were all selected as respondents or subjects.

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

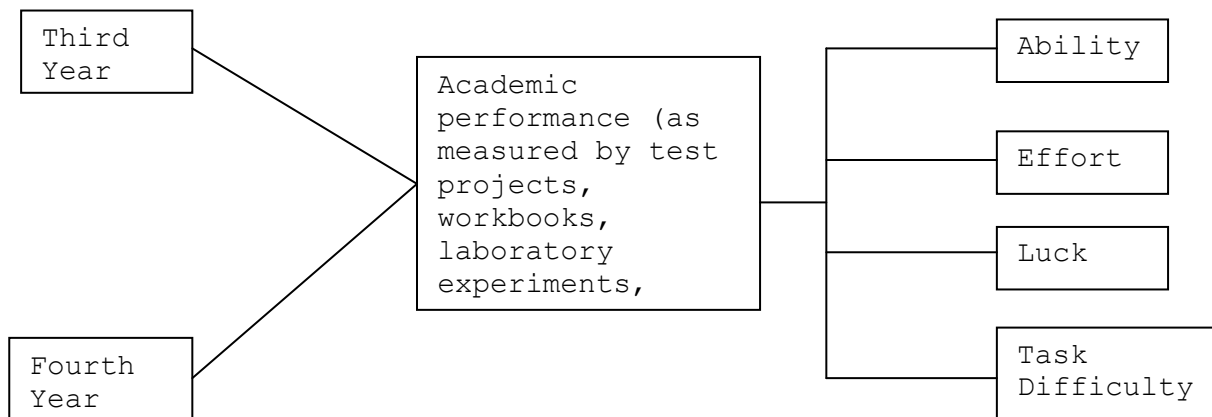


Figure 1. Theoretical framework.

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.

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 ($\%_{\text{mean}}$) for every category of academic performance. To determine whether a significant difference in attribution exists between three categories as sources of academic performance, the Maim-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.

Table 1. Attributions of Academic Performance of Third 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}	$\%_{\text{mean}}$	f_{mean}	$\%_{\text{mean}}$	f_{mean}	$\%_{\text{mean}}$	f_{mean}	$\%_{\text{mean}}$
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%

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

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 (22%).

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	5.8	29%	9	45%	0.6	3%	4.6	23%
Projects, Workbooks and Laboratory 24.525.35%	5	25%	9.5	47.5%	0.6	3%	4.9	24.5%
Class Participation & 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 3. Attributions of Academic Performance of Both Year Levels as Categorized by Test, Projects, 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	12.9	30	19.8	46.05%	1.4	3.26%	8.9	20.7%
Projects, Workbooks and Laboratory 24.525.35%	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%

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 (13.3%). 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 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 4. Over-all View of Ranked Attributions According to Year Level as Categorized by Test, Projects, Workbooks, Laboratory Experiments, Class Participation, and Attendance

Rank	Third Year			Fourth Year			Entire Group		
	Test	P, W & L.e	C.P & A	Test	P, W & L.e	C.P & A	Test	P, W & L.e	C.P & 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

Legend: P – Projects; W – Workbooks; Le – Laboratory experiments; CP – Class Participation; A – Attendance; 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

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	F.	E	E	E	E	E	TD	E
2	A	A	A	TD	A	TD	A	E	TD
3	TD	TD	TD	A	TD	A	TD	A	A
4	L	L	L	L	L	L	L	L	L

Legend: A – Ability; E – Effort; L – Luck; ID - Task Difficulty

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 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. (2012) 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.

Table 6. Result of Statistical Analysis Using Mann-Whitney U-test in 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

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 (1979, 1985) 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 (Weiner, 1979).

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. 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 internal factors effectively influence empowered individuals which is much better than depending on external factors. According to Omrod (cited by Dañocup, 1997); when we attribute behaviors to factors outside ourselves, we are unlikely to change our behaviors in ways that will lead to greater success. And so, attributing behaviors within our control lead to improvement 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.

REFERENCES

- Banks. M. & Woolfson, L. (2008) Why Do Students Think They Fail? The Relationship Between Attributions and Academic Self-Perceptions. Journal compilation. NASEN. Blackwell Publishing, Oxford, MA, USA.
- Bandura, A. (1977). Self-efficacy: Toward a Unifying Theory of Behavior Change. *Psycho-logical Review*, 84, 191-215.
- Bar-Tal, D. (1978). Attributional Analysis of Achievement Related Behaviour. *Review of Education*, 48 (2), 259-271-72.
- Cooper, H. M. (1979). Pygmalion Grows Up: A Model for Teacher Expectation Communication and Performance Influence. *Review of Educational Research*, 49, 389-410.
- Crosnoe, R. (2002) High School Curriculum Track and Adolescent Association with Delinquent Friends. *Journal of Adolescent Research*. b;17:144-168.
- Decharms, R. (1968). *Personal Causation*. New York: Academic Press
- Dañocup, O. B. (1997). Teacher's Attributions for the Cause of Student's Academic Performance at WVSU-College of Education. *WVSU-COE Research Journal*, WVSU Press.

- Farid, F.(2012). Causal Attribution Beliefs Among School Students In Pakistan. Institute of Education and Research at University of the Punjab, Lahore, Pakistan Institute of Interdisciplinary Business Research, 4(2)
- Heider, F. (1958). *The Psychology of Interpersonal Relations*. New York:Wiley.
- Kazdin, A. E. (2000). *Encyclopedia of Psychology*, Vol. 1, 320-325. Washington, DC, US: American Psychological Association; New York, NY, US: Oxford University Press, xiv, 495 pp
- Langer, E. J., & Rodin, J. (1976). The Effects of Choice and Enhanced Personal Responsibility for the Aged: A Field Experiment in an Institutional Setting. *Journal of Personality and Social Psychology*, 34, 191-198.
- Manusov, V. & Spitzberg, B. (2008) *Individually-Centered Theories of Interpersonal Communication Perception*. Great Britain: Cambridge University Press.
- Weiner, B.J. (1972). Attribution Theory, Achievement Motivation, and The Educational Process. *Review of Educational Research*, 42,203-216.
- Weiner, B. An Attributional Approach for Educational Psychology. In L. Shulman (Ed.), *Review of Research in Education* (Vol. 4). Itasca, Ill.: Peacock, 1976.
- Weiner, B. Attribution and affect: Comments on Sohn's critique. *Journal of Educational Psychology*, 1977, 69(5), 506-511.
- Weiner, B. (1979). A Theory of Motivation for Same Classroom Experiences. *Journal of Educational Psychology*, 71, 3-25.
- Weiner, B. (1985). An Attributional Theory of Achievement Motivation and Emotion. *Psychology Review*, 92(40), 548-573
- Weiner, B. (2001). Intrapersonal and Interpersonal Theories of Motivation From An Attribution Perspective. In F. Salili, C. Y. Chiu, & Y. - Y. Hong, (Eds.). *Student Motivation: The Culture and Context of Learning* (pp. 17- 30). N. Y.: Kluwer Academic / Plenum.
- West Visayas State University Handbook.(1999). Office of the Student Services, La Paz, Iloilo City.