



Academic performance and motivational orientation of grade 10 Students in Earth Science

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Abstract

The goal of this study was to determine the connection between academic performance and students' motivational orientation in Grade 10 Earth Science. A total of 325 students out of 1729 students of grade 10 of a typical junior high school of Pasig City, Philippines, the School Year 2018-2019 were asked to participate in this research. The results showed that the academic performance of the students was fairly satisfactory, and their motivational orientations were interpreted as "true of me", which means that the respondents' motivational orientation were in affordance in terms of the variables as to intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety relative to the subject Earth Science. The research found out that generally, there were negligible correlations and insignificant relationships between the students' academic performance and motivational orientations. These findings suggest that though negligible correlations and insignificant relationships were found, extraneous factors may have affected their academic performance aside from the cited sources of motivation, these factors may be the teacher, the learning environment, the learners' home, or the curriculum itself.

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Introduction

For the last decades, teaching and learning Science is related on how it affects the society in terms of its demands and needs. Nowadays, Science is important in shaping learners' cognitive abilities to reach academic progress that is relevant to the scope of competencies academically (Lavigne, Vallerand & Miquelon, 2007) ^[11]. Motivation also plays a vital role in pursuing scientific knowledge (Osborne & Collins, 2001) ^[20]. In sustaining interest in learning Science, students' engagement and exposure must be taken into consideration in order to attain meaningful Science learning (Reis, 2000) ^[23]. Driving students to learn Science, there should be a recognized motivation intrinsically towards learning Science found in students (Guay et.al. 2010) ^[8]. Furthermore, Gredler, Broussard, and Garrison (2004) ^[4], stated that motivating somebody is an act of letting somebody to act or not to act.

Moore (2007) ^[17] stated that motivation is preserving, it can make learning successful, and it can minimize students longing for rewards. Chi Nguyen (2008) ^[19] added that motivation is a driving force related to students' learning. Lai (2011) ^[10] also stated that the enhancement of performance is affected motivational orientations. Empowerment and energy bring successful performance (Coetzee, 2011) ^[6]. Academic performance is therefore an offshoot of students' motivation to learn (Muhammad, Bakar, Mijinyawa, & Halabi, 2015) ^[18]. As Tallent-Runnels *et al.* (2006) ^[26] said that there must be really a link between a student's way of learning and their motivation to learn. Enthusiasm of students to learn are likewise correlated to motivation (Wolters, 1999; Pintrich, Wolters, & Baxter 2000; Schunk & Pajares, 2002) ^[27, 22, 24].

The researcher was prompted to carry out this research to explore the extent of the connection between students' academic

performance and motivational orientation. It is however should be known that the research did not intend to measure the degree or level of motivation of the students but to identify their motivational orientation.

Hennessey (2003) ^[9] defined motivational orientation as one's foundation of motivation.

Research Question

The goal of this research was to figure out the student respondents' motivational orientation of Grade 10 students in a typical Public Junior High School in Pasig City, Philippines, School Year 2018-2019 concerning their academic performance in Earth Science. Specifically, this study aimed to answer the following questions:

1. What is the academic performance of the students in Earth Science?

2. What are the students' motivational orientations in terms of 1.1 Intrinsic Goal Orientation; 1.2 Extrinsic Goal Orientation; 1.3 Task Value; 1.4 Control of Learning Beliefs; 1.5 Self-Efficacy for Learning and Performance; 1.6 Test Anxiety?
3. What is the degree of correlation between the students' motivational orientations and their academic performance?
4. Are there significant correlations between the students' motivational orientations and their academic performance?

Conceptual Framework

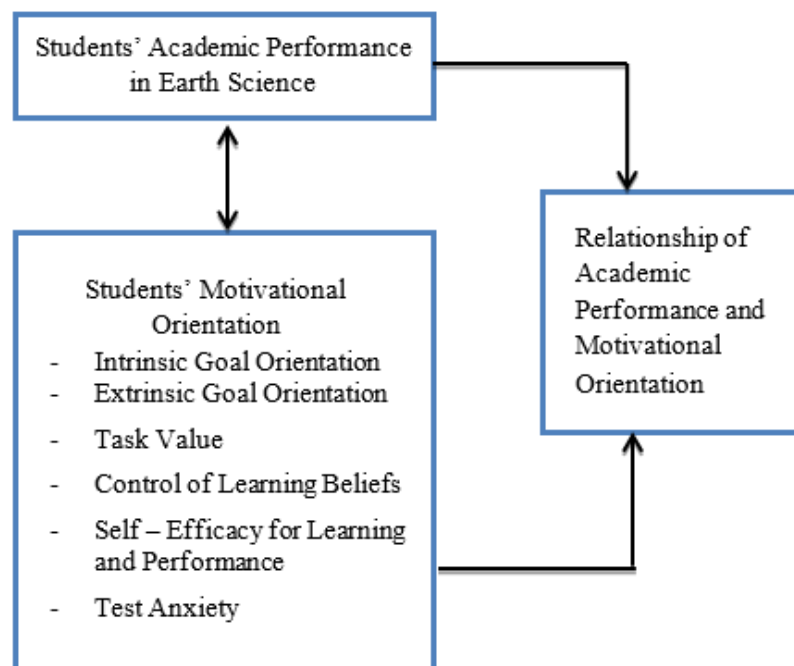


Fig 1: Conceptual Framework of the Research Paper

The conceptual framework implies that the main variables of the research are the students' motivational orientation and their academic performance. These inputs are the basis to test whether there exist correlations and relationships on the involved variables. The variables that were studied are Intrinsic Goal Orientation, Extrinsic Goal Orientation, Task Value, Control of Learning Beliefs, Self – Efficacy for Learning and Performance and Test Anxiety. These motivational orientations were correlated to the academic performance of the students who took part in the survey.

Methodology

Design

The quantitative approach was used in the study because it delved into numerical information related to the subject of the inquiry. Quantitative research, according to Hunter and Leahey (2008), is the systematic exploratory study of sociological phenomenon using quantitative, probabilistic, or computational techniques. The research methodology used was descriptive research. This area of research entails identifying attributes of a sociological phenomenon or investigating potential correlations between two or more phenomena. Descriptive study investigates a scenario as it is in every case (Leedy and Ormrod, 2014). The correlational

design of descriptive research was also used to determine the relationship between students' motivational orientation and academic performance. Correlational design investigates the extent to which variations in one characteristic or variable are related to differences in one or more other characteristics or variables. A correlation exists when one variable increases and the other variable either increases or declines in a reasonably predictable manner (Leedy and Ormrod, 2014).

Sample

The main respondents of the research are the grade 10 junior high school students at a typical Public Junior High School in Pasig City. A total of 325 students were selected to be student respondents. These respondents were randomly selected from the middle bracket sections of the grade 10 junior high school students. The purposive sampling was used to determine the respondents.

Table 1: Characteristics of the Respondents

Respondents' Profile	Frequency	Percentage
Sex	Male	82 25.23 %
	Female	243 74.77 %
Total	325	100.00%
Age	17	65 20 %

	16	163	50.15 %
	15	97	29.85 %
Total		325	100.00%

Table 1 indicates the characteristics of the respondents of this research. It implies that 82 (25.23%) are males while there are 243 (74.77%) females, which means that majority of the respondents are females. In terms of age, it can be gleaned from Table 1 that the majority of the respondents are 16 (50.15%) years old, followed by 15 (29.85 %) years old, and the lowest number is 17 (20%) years old.

Instrument

This research paper used a modified questionnaire based on Pintrich, Smith, Garcia, and McKeachie's "A Manual for the Use of the Motivated Strategies for Learning Questionnaires" (1991). The behaviors measured by the instrument are intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning performance, and task anxiety. It used a 4-point rating scale with the following verbal interpretation: 4 (Very True of Me); 3 (True of Me); 2 (Untrue of Me); and 1 (Very Untrue of Me). The academic performance of the students was based on their first quarter grade in Earth science. This would show the students' output in Earth Science based on their written works, a performance task, and a quarterly exam. The description and grading scale are as follows: outstanding (100-90); very satisfactory (89-85); satisfactory (84-80); fairly satisfactory (79-75); did not meet (74-below). This is based on DepEd Order No. 8 Series of 2015, "Policy Guidelines on Classroom Assessment for the K to 12 Basic Education Program."

Expert judgments and pilot testing or a dry run are part of the "questionnaire's" validation procedure. The instrument's draft was shown to specialists for feedback and ideas. The feedback and ideas were then integrated into the questionnaire's final draft. A dry run on 15 selected science teachers was undertaken to improve the instrument's content validity. The Cronbach Alpha coefficient was calculated to determine consistency and reliability. The calculated value of 0.67 suggests that the items in the questionnaire have relatively strong coefficients, indicating good consistency and reliability. The final draft of the questionnaire was provided to the study's participants for distribution.

Data Gathering Procedure

Written permission to the principal of the public school was made for the researcher to conduct the research. It was then followed by a letter to the teachers requesting the

participation of their students. Also, informed consent was made to the students upon requesting them to answer the instrument. The head teacher in science assisted the researcher in distributing and retrieving the survey questionnaire. It took the researcher two months to retrieve and analyse the data from the respondents. The accomplished questionnaires were collected and tallied. Finally, they were interpreted and analysed.

Data Analysis Techniques

The information gathered was subjected to statistical analysis. The weighted mean, Pearson – r, and t-test for r were utilized in this study. The students' motivational orientation was calculated using the weighted mean, Pearson – r was used to quantify the degree of correlation between the students' motivational orientation and their academic performance, and the t-test for r was used to test the significance of the degree of association between the student's motivational orientation and their academic performance.

Results and Discussion

1. Academic performance of the respondents in Earth Science. Table 2 and its corresponding discussion answer research question number 1 of this research.

Table 2: Academic Performance of Grade 10 Students in Earth Science

Grade	Frequency	Percentage	Performance
90-100	1	.31%	Outstanding
85-89	34	10.46%	Very Satisfactory
80-84	128	39.38%	Satisfactory
75-79	135	41.54%	Fairly Satisfactory
0-74	27	8.31%	Did Not Meet Expectations
Total	325	100 %	

Based on table 2, only 1 (.31%) student got an outstanding performance, 34 (10.46%) have very satisfactory performance, 128 (39.38%) have satisfactory performance, 135 (41.54%) got fairly satisfactory performance and, 27 (8.31%) got did not meet expectations performance. This means that the majority of the students got a fairly satisfactory performance in Earth Science and that there were only one of the student respondents who got an outstanding performance.

2. Motivational orientation of the student respondents.

Table 3 and its corresponding discussion answer research question number 2 of this research.

Table 3: Motivational Orientation of Grade 10 Students in Earth Science

Items	Weighted Mean	Verbal Interpretation
Intrinsic Goal Motivational Orientation		
1. In Earth Science subject, I look forward for challenging class activities.	3.15	True of Me
2. In Earth Science subject, I favor activities the arouses my curiosity.	3.26	Very True of Me
3. In Earth Science subject, I'am most satisfied when I understand the lesson.	3.29	Very True of Me
4. If I have the chance in Earth Science subject, I select coursework that will help me discover even if they would not guarantee a better grade.	2.79	True of Me
Overall	3.12	True of Me
Extrinsic Goal Motivational Orientation		
5. Right now, getting a good grade in Earth Science subject is the most satisfying thing for me	3.42	Very True of Me
6. Right now, the most essential thing for me is to improve my total grade point average, so getting a decent mark in Earth Science subject is my main worry.	3.38	Very True of Me
7. If possible, I'd like to outperform the majority of my classmates in Earth Science subject.	2.98	True of Me

8. I want to get through Earth Science subject because I'd like to demonstrate my abilities to my parents, colleagues, and several others.	3.05	True of Me
Overall	3.21	True of Me
Task Value		
9. I look Forward to being able to apply what I have learned in Earth Science subject to other classes.	3.12	True of Me
10. In the Earth Science subject, I have to study the coursework.	3.36	Very True of Me
11. I'm extremely interested in the Earth Science subject's substance.	3.14	True of Me
12. I believe the Earth Science course content will be beneficial to my learning.	3.34	Very True of Me
13. I am interested in Earth Science as a subject.	3.07	True of Me
14. It is critical for me to comprehend the source material in Earth Science.	3.26	Very True of Me
Overall	3.22	True of Me
Control of Learning Beliefs		
15. I would be able to understand the content in the Earth Science topic provided I learn with in right method.	3.06	True of Me
16. If I don't learn the Earth Science stuff, it's my problem.	3.26	Very True of Me
17. If I work hard sufficiently, I will be capable of understanding the Earth Science course content.	3.33	Very True of Me
18. If I do not really comprehend the Earth Science course content, it was because I didn't put in just enough effort.	3.15	True of Me
Overall	3.19	True of Me
Self-Efficacy for Learning and Performance		
19. I am confident that I will earn an outstanding grade in Earth Science.	2.86	True of Me
20. I am confident that I can comprehend the most challenging topics offered in the Earth Science texts.	2.62	True of Me
21. I am confident in my ability to grasp the fundamental topics taught in Earth Science classes.	3.25	True of Me
22. I am convinced that I can comprehend the most difficult material offered by the Earth Science teacher.	2.71	True of Me
23. I'm convinced that I'll do a fantastic job on the Earth Science homework and assessments.	2.80	True of Me
24. I anticipate doing very well in the Earth Science course.	3.04	True of Me
25. I am confident that I will be able to master the abilities given in the Earth Science class.	2.54	True of Me
26. I believe I will perform well in Earth Science class, given the complexity of the subject, the teacher, and my abilities.	3.10	True of Me
Overall	2.87	True of Me
Test Anxiety		
27. Whenever I complete an Earth Science test, I consider how badly I am performing in comparison to those other students.	2.70	True of Me
28. Whenever I undertake an Earth Science test, I consider the questions on the other portions of the exam that I am unable to respond.	3.17	True of Me
29. Whenever I take a test in Earth Science, I consider the ramifications of failure.	3.03	True of Me
30. When I take an Earth Science exam, I get a nervous and agitated feeling.	2.56	True of Me
31. When I take an Earth Science exam, I notice that my heart is racing.	2.65	True of Me
Overall	2.82	True of Me

Table 3 above explains that the student respondents' overall motivational orientation was interpreted as "true of me". This implies that the student respondents' motivational orientation was in affordance in terms of the variables as to intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety relative to the subject Earth Science.

Looking closely at the individual result of each variable, the results suggest that the student respondents responded more positively to "task value" with a weighted mean of 3.22. This means that the student respondents get their motivation on how interesting, how important, and how useful their tasks relative to learning Earth Science. On the other hand, with a weighted mean of 2.82, test anxiety got the lowest responses, which means that the lowest source of their motivation in learning Earth Science comes from this variable. This could

be because test anxiety is a condition in which pupils suffer distress and anxiety during learning, and it is linked to low expectations and poor academic achievement. The findings support those of Bomia *et al.* (1997) ^[3], who found that student motivation is defined as a student's willingness to invest in and participate in the learning process, and it includes necessity, desire, and duty to study. Furthermore, the research findings in table 3 of this research is in line with Momanyi *et al.*, (2015) ^[16], who believed that motivated learners have an inherent potential to understand and do not require any prize or enticement to perform a task.

3. Degree of correlation of the student's academic performance and their motivational orientation and its significance. Table 3 and its corresponding discussion answer research problem number 3 and 4.

Table 3: Relationship of Students' Academic Performance and Motivational Orientation

Items	r-value	Correlation	p-value	Interpretation
Intrinsic Goal Motivational Orientation				
1. In Earth Science subject, I look forward for challenging class activities.	0.04	Negligible	0.43	Not Significant
2. In Earth Science subject, I favor activities the arouses my curiosity.	0.02	Negligible	0.78	Not Significant
3. In Earth Science subject, I'am most satisfied when I understand the lesson.	0.40	Low	0.03	Significant
4. If I have the chance in Earth Science subject, I select coursework that will help me discover even if they would not guarantee a better grade.	0.36	Low	0.00	Significant
Overall	0.21	Low	0.32	Not Significant
Extrinsic Goal Motivational Orientation				
5. Right now, getting a good grade in Earth Science subject is the most satisfying thing for me.	0.04	Negligible	0.50	Not Significant
6. Right now, the most essential thing for me is to improve my total grade point average, so getting a decent mark in Earth Science subject is my main worry.	0.09	Negligible	0.13	Not Significant
7. If possible, I'd like to outperform the majority of my classmates in Earth Science subject.	0.14	Negligible	0.01	Significant
8. I want to get through Earth Science subject because I'd like to demonstrate my abilities to my parents, colleagues, and several others.	0.00	Negligible	0.94	Not Significant
Overall	0.07	Negligible	0.40	Not Significant
Task Value Motivational Orientation				
9. I look Forward to being able to apply what I have learned in Earth Science subject to other classes.	0.33	Low	0.02	Significant
10. In the Earth Science subject, I have to study the coursework.	0.02	Negligible	0.70	Not Significant
11. I'm extremely interested in the Earth Science subject's substance.	0.44	Moderate	0.01	Significant
12. I believe the Earth Science course content will be beneficial to my learning.	0.02	Negligible	0.72	Not Significant
13. I am interested in Earth Science as a subject.	0.08	Negligible	0.14	Not Significant
14. It is critical for me to comprehend the source material in Earth Science.	0.04	Negligible	0.43	Not Significant
Overall	0.16	Negligible	0.34	Not Significant
Control of Learning Beliefs				
15. I would be able to understand the content in the Earth Science topic provided I learn with in right method.	0.12	Negligible	0.03	Significant
16. If I don't learn the Earth Science stuff, it's my problem.	0.03	Negligible	0.53	Not Significant
17. If I work hard sufficiently, I will be capable of understanding the Earth Science course content.	0.03	Negligible	0.56	Not Significant
18. If I do not really comprehend the Earth Science course content, it was because I didn't put in just enough effort.	0.13	Negligible	0.02	Significant
Overall	0.08	Negligible	0.29	Not Significant
Self-Efficacy for Learning and Performance				
19. I am confident that I will earn an outstanding grade in Earth Science.	0.02	Negligible	0.72	Not Significant
20. I am confident that I can comprehend the most challenging topics offered in the Earth Science texts.	0.10	Negligible	0.07	Not Significant
21. I am confident in my ability to grasp the fundamental topics taught in Earth Science classes.	0.20	Negligible	0.00	Significant
22. I am convinced that I can comprehend the most difficult material offered by the Earth Science teacher.	0.06	Negligible	0.27	Not Significant
23. I'm convinced that I'll do a fantastic job on the Earth Science homework and assessments.	0.03	Negligible	0.56	Not Significant
24. I anticipate doing very well in the Earth Science course.	0.00	Negligible	0.94	Not Significant
25. I am confident that I will be able to master the abilities given in the Earth Science class.	0.00	Negligible	0.92	Not Significant
26. I believe I will perform well in Earth Science class, given the complexity of the subject, the teacher, and my abilities.	0.10	Negligible	0.06	Significant
Overall	0.06	Negligible	0.44	Not Significant
Test Anxiety				
27. Whenever I complete an Earth Science test, I consider how badly I am performing in comparison to those other students.	0.02	Negligible	0.62	Not Significant
28. Whenever I undertake an Earth Science test, I consider the questions on the other portions of the exam that I am unable to respond.	0.00	Negligible	0.99	Not Significant
29. Whenever I take a test in Earth Science, I consider the ramifications of failure.	0.05	Negligible	0.40	Not Significant
30. When I take an Earth Science exam, I get a nervous and agitated feeling.	0.09	Negligible	0.11	Not Significant
31. When I take an Earth Science exam, I notice that my heart is racing.	0.11	Negligible	0.04	Significant
Overall	0.05	Negligible	0.43	Not Significant

Legend (correlation): $r = .00$ to $\pm .20$ negligible correlation, $r = \pm .21$ to $\pm .40$ low correlation, $r = \pm .41$ to $\pm .70$ moderate correlation, $r = \pm .71$ to $\pm .99$ high correlation, $r = \pm 1.00$ perfect correlation

Legend (significance): when p is equal or less than 0.05, significant
When p is greater than 0.05, not significant

Table 3 shows the degree of correlation and the significance of the respondents' academic performance and motivational orientation. It can be gleaned from the table that generally; all the cited motivational orientations were either had a low or negligible correlation to the student respondents' academic performance. This is manifested by the overall value of correlation which is 0.05 (negligible correlation), this means that overall, the motivational orientation and academic performance of the student respondents have a negligible correlation. Furthermore, at a 0.05 level of significance with an overall *p-value* of 0.43 (not significant), all the cited motivational orientations have no significant relationships or correlation to the student respondents' academic performance. The findings of Lemos and Verissimo's research partially support the findings of this study when they discovered that external rewards have a detrimental effect on academic performance. However, the findings of this research may differ slightly from that of other investigators. For instance, Ayub (2010) ^[2] identified a link between students' academic motivation and performance, which also is consistent with the results of Sikhwari (2014) ^[25], who discovered that academic success was strongly correlated with the element of motivation a student possessed. Lepper, Copus, and Iyengar (2005) ^[13] discovered the same result, that there is indeed a favorable connection between social academic achievements. The findings of this study did not agree with the findings of Amrai *et al.* (2011) ^[1], who found a strong relationship for both scholastic performance and student motivation. Though the results of this research suggest that basically, the student respondents were moderately in affordance to the variables (source of motivation) as to intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety relative to the subject Earth Science and that these sources of motivation have low to negligible connection to their academic performance and have no significant relationship to their academic performance. This arguably implies that extraneous factors may affect academic performance aside from the cited sources of motivation, these factors may be the teacher, the learning environment, the learners' home, or the curriculum itself. With this, exploratory research might be done to explore the said factors.

Conclusion

After the completion of this research and based on the findings cited above, the researcher has the following conclusions. First, regarding the respondents' motivational orientation, the study found out that the student respondents' motivational orientation were in affordance in terms of the variables presented to them as included in the questionnaire in terms of intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety relative to the subject Earth Science, which means that, in general, they agree with the statements presented to them in the questionnaire. Second, as regards the student respondents' academic performance, it was found out that the majority of the performance of the Grade 10 students in Earth Science is *fairly satisfactory*. And lastly, in terms of the degree of correlation and significance of the respondents' academic performance and motivational orientation, this research found out that the motivational orientation of the student respondents has low to negligible correlation and that it has

no significant relationship with their academic performance in Earth Science, which means that the student respondents' academic performance is not mainly affected by their level of motivational orientation but also with other extraneous factors such as but not limited to teachers, learning environment, learners' situation at home, or the curriculum itself.

Recommendations

Based on the findings and conclusions of this study the following recommendations are proposed: (1) For students to perform better in Earth Science, they should not only continue being learning goal-oriented, performance-oriented, and motivated in learning but also be aware and prepared of the appropriate knowledge needed in understanding and learning Earth Science; (2) Future studies involving the students' fairly satisfactory performance in Earth Science should be considered to understand the factors that lie behind this performance; (3) an explanatory and exploratory research design is suggested to understand the low to negligible relationship and having a not significant interpretation of the student's academic performance to their motivational orientation; (4) findings of the research as inputs for teaching enhancement program

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