Raising naturalistic intelligence towards increasing academic performance: Environmental activities alongside learning

Elymar A. Pascual

elymarpascual@rocketmail.com
Department of Education, Nagcarlan Sub-Office, Laguna, Philippines, 4002

Abstract

One of the eight multiple intelligences being neglected in the academe world is the naturalistic ability. This is the skill and intelligence which is closely related to environmental awareness, and leads a person to become engaged in exploring the things around him, especially those with life form. The purpose of this study was to investigate on the effect of nurturing vegetables alongside learning to the academic performance of Grade 11 ABM learners of Talangan Integrated National High School, Nagcarlan, Laguna, Philippines. Thirty-eight learners initially benefitted on this exploratory-sequential mixed study, with 21 participants (7 teachers, 7 parents and 7 learners) in the qualitative survey questions. The 38 ABM learners were given a 5-week challenge of planting vegetables of their choice, which they were asked to do in school during vacant times – having a contact with their environment by choosing the vegetable to plant, observation of the growth of their vegetable, exploration, classification, and ultimately leading to forming a hobby of cultivating vegetables at home. After the 5-week challenge, it was found out that the naturalistic intelligence and academic performance from second quarter to third quarter of the school year significantly increased, using paired t-test and supported by p-values. The result of the written interview to the participants with regards to how naturalistic intelligence was nurtured by the five activities (contact, observation, exploration, classification and hobby) generated five themes: (1) Contact with things around us creates awareness and later breeds curiosity; (2) Keen observation of how living things grow helps in forming environmental inclination; (3) Knowledge and different information are available through environment exploration; (4) Identifying the characteristics and classification of different kinds of life form discloses inspiring creation; and (5) Development of hobby in personal life is possible when the importance of an ability is realized. Recommendations to school heads and officials, teachers and advisers, DepEd officials, family and community were laid down at the end of the study.

Keywords: naturalistic intelligence; environment; academic performance

1. Context and Rationale

The Department of Education (DepED) Memorandum No. 223, series of 2016, entitled "Strengthening the Implementation of the Gulayan sa Paaralan Program (GPP) in Public Elementary and Secondary Schools Nationwide" was crafted to support the hunger mitigation initiatives of the government, and to encourage both public elementary and secondary schools to establish school gardens to ensure continuous 1supply of vegetables for the school-based feeding program. Among its aims are to promote vegetable production, establish and maintain school gardens, and serve as laboratory for learners. The latest update about the GPP is the DepEd Memorandum No. 101, series of 2023, entitled "Submission of SY 2022-2023 Action Plan for the Implementation of Gulayan sa Paaralan Program (GPP) in all Public Elementary

and Secondary Schools. This is after the two school years of pandemic wherein learning happened in distance mode, thereby making it difficult, if not impossible, in those times to implement this program.

It is interesting to note that having the love to nurture plants, trees and vegetables is part of the eight multiple intelligences whose proponent was Howard Gardner. It is implied that naturalistic intelligence is at the back of this GPP program of the Department of Education. The eight multiple intelligences are mathematical, spatial, interpersonal, intrapersonal, linguistic, musical, kinesthetic and naturalistic. Others would add spiritual as the nineth intelligence, but it was not universally acclaimed as part of the multiple intelligences, though believed to be important as well. The Gulayan sa Paaralan Program (GPP) taps the naturalistic intelligence as it trains not only the teachers but also the learners to be environmentally aware and be inclined to the things about nature. But would it be more interesting if this school program be brought down to the smaller units, and that is the classroom level? Would it be more meaningful if every classroom would have their own nearby garden, if possible, to grow, nurture and harvest vegetables?

Another interesting aspect is the consideration of the effect of having naturalist intelligence is its connection or effect to academic performance. Recently, it was documented that the average grade of the 39 Accountancy, Business and Management (ABM) 11-Vibrant learners of Talangan Integrated National High School, Nagcarlan, Laguna, Philippines was 86.01, and this was during the second quarter of the school year 2022-2023. One among them has an average between 75-79, eleven has an average between 80-84, twenty-one has an average between 85-89, and six has an average between 90-94.

What if the Gulayan sa Paaralan Program (GPP) be brought to the classroom level wherein the learners will be having their garden near their classroom? Can this activity raise the naturalist intelligence of the learners? Will the academic performance be positively impacted because of raising their naturalist intelligence and environmental awareness? This was the issue that this study explored.

2. Literature Review

The book of Howard Gardner entitled Frames of Mind, published in the year 1983, highlighted seven multiple intelligences that every person has at some degree or level. Twelve years after this publication, he added the naturalistic intelligence. This is a skill that allows a person to interact to the environment and other species in a special way. (All about the Naturalist Intelligence, 2023)

It was already established in the study by Ahvan and Pour (2016) that seven out of eight multiple intelligences have significant positive relationship with academic performance or the achievement of study, having the computed p-value less than the alpha level (0.05). These seven MI are the following: logical-mathematical, visual-spatial, verbal-linguistic, intrapersonal, bodily-kinesthetic, interpersonal and naturalistic. The only one not included here is the intrapersonal skill. This finding provided a resounding reason for the author to initiate naturalistic activities to the students for the high possibility of increasing their academic performance.

The study of Watve and Watve (2018) tried to find out the relationship of naturalistic intelligence with the other seven intelligences, and they found out that the other seven MI's have moderate significant correlation with naturalistic intelligence. This is for the simple reason that those who have high naturalistic skill tend to be sensitive with variety, relationships of things in the environment, and in patterns found in natural objects. They make use of their multiple senses while lavishing or experiencing their surroundings. This includes the use of their visual, auditory, olfactory, tactile and gustatory senses. While taking note of this, it can be said that mathematical skill can be increased when the naturalistic skill is enhanced.

Nirao, et. al. (2012) investigated on the different levels of thinking skills and their relationship with mathematical intelligences. They learned that at the lowest level which is knowledge, mathematical

intelligence failed to provide evidence of correlation, while on the higher level which are application and reasoning (analysis), significant relationship was established. The authors reasoned out that this is in consonance with Garner's multiple intelligences theory, that a person might be low in mathematical intelligences but shows high level of practical skill and reasoning, making the application and analysis part of mathematical problem enjoyable and challenging for them, if not easy to deal with.

With regards to difference of MI level across gender, it was found out in the study of Gonzalez-Trevino, et. al. (2020) that there are significant differences in all intelligences except for intrapersonal. Males were reported to have significantly higher level of intrapersonal skill than females. This can be attributed to the fact that males are more reserved than females, that is, they internalized things more often than females. Across grade in school, there was none among 8 MI's that appeared to have significant difference. The findings in their study was different from the findings in the study conducted by Saricaoglu and Arikan (2009). They found out that it is only in linguistic intelligence that significant difference was found across gender. On the other hand, Sener and Çokçalışkan (2018) support Trevino, et. al. in finding out that in all 8 MI's, intelligence levels have significant differences across gender. They also found out that multiple intelligence levels have moderate positive correlation with learning styles. When multiple intelligences were included in teaching approach in Economics subject, it was found out that that learners' perception level of the MI approach used by the teacher are not significantly difference across gender (Yidana, Arthur and Ababio, 2022). More so, interpersonal intelligence was perceived to be often used in teaching the said subject, and bodily-kinesthetic intelligence level produced significant difference in learner's perception when checked across different approach based on teacher's experience.

Naturalistic intelligence is usually seen as synonymous with environmental awareness. This was proven true in the study by Ningrum, Soesilo and Herdiansyah (2018). In their study, they used the environmental science students as respondents. Their first finding is that these learners have high naturalistic intelligence and good environmental awareness. And with the correlation coefficient of 0.754, it was established that naturalistic intelligence is significantly correlated with environmental awareness. Those who have interest in naming flora and fauna, comprehending the environmental problems, lavishing in outdoor activities, developing hobby in environment activities, and having concern to environmental change, also have high awareness of the environment. The knowledge of this provided the author options in choosing activities to be provided to learners in order for their naturalistic intelligence raised and hoping that their academic performance would increase.

Bintang, et. al. (2018) integrated multiple intelligences theory in handling their classes. Ninety percent of the students followed the classroom instruction when naturalistic skill is tapped. Not only that the learners were encouraged to follow instructions, classroom session also became enjoyable for them.

Focusing on naturalistic intelligence, Mumthas and Umer Farooque (2012) found out that girls have significantly higher naturalistic intelligence than boys. More so, students in higher level have significantly higher naturalistic intelligence than students in lower level.

Using the naturalist approach in teaching Mathematics, San Miguel and Pascual (2021) have established three themes why using nature as springboard is helpful: interaction, imagination and concrete notion.

> *"Teaching Mathematics using the* naturalist approach is effective because learners interact with their immediate environment thereby inducing interaction, too, when Mathematics is discussed. Imagination, which is also an important component in understanding Mathematics, is practiced in dealing with nature. Math being abstract *becomes easier to understand when concrete things in nature are used as springboard."*

The above-mentioned readings helped shed light in this present study in such a way that it provided idea to the author on the power of tapping the naturalistic intelligence of the learners so as to possibly increase their academic performance. More so, the concepts established and findings revealed aided in the external analysis of the findings found in this study.

2.1. Action Research Questions

This action research is focused on determining the effect of having vegetable planting activity in a classroom level to the academic performance of Grade 11 Accountancy, Business and Management (ABM) Learners of Talangan Integrated National High School for this school year 2022-2023.

Specifically, it seeks to answer the following questions:

- What is the mean level of naturalist intelligence and academic performance of Grade 11 ABM learners before the implementation of vegetable planting activity in classroom level?
- What is the mean level of naturalist intelligence and academic performance of Grade 11 ABM learners after the implementation of vegetable planting activity in classroom level?
- Is there a significant difference in naturalist intelligence level and academic performance of Grade 11 ABM learners before and after the implementation of vegetable planning activity in classroom level?
- According to learners, teachers and parents, how can naturalist intelligence be nurtured by the following key activities:
  * contact;
  * observation;
  * exploration;
  * classification; and
  * hobby?

2.2. Proposed Innovation, Intervention and Strategy

Raising naturalistic intelligence in this study is neither a teaching approach nor an articulation of lessons in any subject, but a school extra-curricular, environmental activities in classroom level which was introduced as a challenge by the teacher-author to his advisory class. The ABM 11 Vibrant of Talangan Integrated National High School has to plant vegetables with the plant vase given to them. The 39 learners were divided into 8 groups in doing this task.

Formerly, the ABM 11 Vibrant has Biological spot outside their classroom, but not a vegetation. The hallway was filled with plants which are basically welcome plants and cacti. It is not in connection with the Gulayan sa Paaralan Program (GPP) of the Department of Education.

Fig. 1. Some of the former plants outside the ABM 11 classroom when planting vegetable was not yet organized for this study

In this study, the researcher maintained having biological feature or ecosystem outside the classroom while abiding with GPP. The activity began as a challenge to the learners to plant and nurture small vegetation outside the classroom. He provided eight elongated plant vase and provided one for each of the eight groups. The groups were then challenged to plant vegetables to the vases provided to them, following a series of five challenges **(environmental activities)** that will raise their naturalistic intelligence.

Challenge 1 Contact – This was the challenge for the first week. Learners had nature walk to find their chosen vegetable to grow in their elongated pot. This was preferably a small plant already and not just a seed. Learners needed to put their names in the elongated pot provided to them. Naming could be through the use of card pasted on stick standing on the soil.

Challenge 2 Observation – This was the challenge for the second week. Once in contact with nature, they have taken note and observed the growth each day or week.

Fig. 2. Elongated pots to be used for planting vegetables

Challenge 3 Exploration - This was the challenge for the third week. With the use of magnifying glass, a microscope or binoculars they needed to have a close-up picture of the leaves, stem or sprout from the vegetable.

Challenge 4 Classification - This was the challenge for the fourth week. With the help of parents, books or the internet, the learners needed to classify their vegetable and be able to put the scientific name of it as a label in the elongated pot.

Challenge 5 Hobby - This was the challenge for the fifth week. Learners were encouraged to develop a hobby such as planting vegetables at home.

Alongside these weeks of challenges, every group should have a weekly post of how they accomplish each challenge. While having this exploration activity, academic performance of learners was documented to observe how raising their naturalistic intelligence affected their academic performance.

3. Action Research Methods

This portion of the study highlights the participants, sources of data, data gathering methods, data analysis plan, and ethical issues to be taken care so as to follow proper guidelines in conducting an academic study.

3.1. Participants and/or other Sources of Data and Information

The chosen learners are the advisory class of the researcher. He also handles the first period of the

class every morning, except for Fridays. Here is the composition of the learners in terms of sex:

Table 1. The participants of the study

Sex	Frequency
Male	12
Female	26
Total	**38**

The 38 learners will be the source of data for SOP numbers 1 and 2, specifically, the data regarding naturalist intelligence level and academic performance, both before and after the introduction of naturalistic activity. For SOP number 4, aside from the 38 learners, the 5 grade 11 advisers, as well as the parents of the learners will be interviewed through pen-and-paper survey questionnaire with regards to their idea on the different activities that can be done to raise naturalistic intelligence.

3.2. Data Gathering Methods

For the pre-and post-test on naturalistic intelligence level, a Likert-Scale questionnaire with five items were provided to the learners to measure the said variable.

For the academic performance, the second and third quarter general averages were documented and compared.

For shedding light on how different environmental activities could raise naturalistic intelligences, a pen-and-paper survey questionnaire was used to get responses from learners, teachers and parents.

3.3. Data Analysis Plan

In order to provide meaningful presentation and analysis of data, the following tools were used for each of the items in the statement of the problem:

For SOP 1 and 2 – mean and standard deviation

For SOP 3 – t-test for correlated means

For SOP 4 – thematic analysis

3.4. Ethical Issues

The following measures were observed so as to protect and uphold proper etiquettes in doing research:

- A proposal was submitted to the school head and upon her approval, this study will be pushed through.
- Informed consent was secured for all learners through their parents' approval for their sons/daughters to be included as participants of this study. Teacher-respondents also have informed consent so that they could provide insights in the development of this study.

- Free-will acceptance of every week's challenges became the guiding principle in encouraging learners to tend their vegetables, as this was not part of their academics, but just an intervention that is deemed to provide them good result. While free-will was observed, those who completed the 5-week challenge were given certificate of naturalistic intelligence activity exploration.
- The names of the participants were not divulged in any of the pages of this study, to protect or safeguard their identity.
- The findings were revealed to the participants because they were the first beneficiary of the result of this study.

4. Discussion of Findings

4.1. Naturalistic Intelligence Level before the Implementation of the Vegetable Planting Activities

Table 2. Mean level of naturalistic intelligence before the implementation of the vegetable planting activities

Indicators	Mean	SD	Interpretation
1. Contact (I care about the environment and like to be in touch with nature.)	4.05	0.80	High Level
2. Observation (I like to observe and discover new species and behaviors.)	4.03	0.91	High Level
3. Exploration (I am interested in using tools to help exploration – microscopes, binoculars, telescopes.)	3.47	1.08	High Level
4. Classification (I am good at identifying fauna and flora.)	3.11	0.89	Moderate Level
5. Hobby (I show an interest in science careers – biology, botany, chemistry, zoology, etc.)	3.00	0.96	Moderate Level
Average	**3.53**	**0.93**	**High Level**

Legend:
4.21 – 5.00 Very High Level
3.41 – 4.20 High Level
2.61 – 3.40 Moderate Level
1.81 – 2.60 Low Level
1.00 – 1.80 Very Low Level

The figure above shows the naturalistic intelligence level of the 38 learners before the implementation of environmental awareness activities. It can be seen that the contact aspect of naturalistic intelligence has a mean value of 4.05, standard deviation (sd) of 0.80, and verbal interpretation of high level. The observation aspect has a mean value of 4.03, sd of 0.91, and verbal interpretation of high level. The exploration aspect is at 3.47 mean level, sd at 1.08, and verbally interpreted as high level. The classification aspect is at 3.11 mean level, sd at 0.89, and verbally interpreted as moderate level. The hobby aspect is at 3.00, sd at 0.96, and verbally interpreted as moderate level. Overall, the naturalistic intelligence of the ABM 11 Vibrant learners of Talangan Integrated National High School has a mean level of 3.53, standard deviation of 0.93, with verbal interpretation of high level. The standard deviation which is lower than 1 signifies a

homogenous sample, that is, the learners have a closely in-tacked level of naturalistic intelligence.

4.2. Academic Performance before the Implementation of Vegetable Planting Activities

Table 3. Mean level of academic performance before the implementation of the vegetable planting activities

Academic Standing	Frequency	Percentage	Mean	SD
Outstanding (90-100)	8	21.05	92.00	2.56
Very Satisfactory (85-89)	14	36.84	86.86	1.66
Satisfactory (80-84)	16	42.11	81.75	1.06
Overall	**38**	**100**	**85.79**	**4.30**

The table above displays the academic performance of the thirty-eight ABM 11 Vibrant learners of Talangan Integrated National High School during the second quarter of the school year 2022-2023, when the environment awareness activities were not yet implemented alongside learning. It can be seen that there were eight learners having a general average of between 90 and 100, fourteen learners between 85 and 89, while sixteen learners between 80 and 84. The overall general average of the learners was 85.79 with a standard deviation of 4.30.

4.3. Naturalistic Intelligence Level after the Implementation of the Vegetable Planting Activities

Table 4. Mean level of naturalistic intelligence after the implementation of the vegetable planting activities

Indicators	Mean	SD	Interpretation
1. Contact (I care about the environment and like to be in touch with nature.)	4.34	0.63	Very High Level
2. Observation (I like to observe and discover new species and behaviors.)	4.26	0.79	Very High Level
3. Exploration (I am interested in using tools to help exploration – microscopes, binoculars, telescopes.)	4.21	0.87	Very High Level
4. Classification (I am good at identifying fauna and flora.)	3.53	0.89	High Level
5. Hobby (I show an interest in science careers – biology, botany, chemistry, zoology, etc.)	3.79	0.87	High Level
Average	4.03	0.81	**High Level**

Legend:
4.21 – 5.00 Very High Level
3.41 – 4.20 High Level
2.61 – 3.40 Moderate Level
1.81 – 2.60 Low Level
1.00 – 1.80 Very Low Level

The figure on the previous page shows the naturalistic intelligence level of the 38 learners after the implementation of environmental awareness activities. It can be seen that the contact aspect of naturalistic intelligence has a mean value of 4.34, standard deviation (sd) of 0.63, and verbal interpretation of very high level. The observation aspect has a mean value of 4.26, sd of 0.79, and verbal interpretation of very high level. The exploration aspect is at 4.21 mean level, sd at 0.87, and verbally interpreted as very high level. The classification aspect is at 3.53 mean level, sd at 0.89, and verbally interpreted as high level. The hobby aspect is at 3.79, sd at 0.87, and verbally interpreted as high level. Overall, the naturalistic intelligence of the ABM 11 Vibrant learners of Talangan Integrated National High School has a mean level of 4.03, standard deviation of 0.81, with verbal interpretation of high level. The standard deviation which is lower than 1 signifies a homogenous sample, that is, the learners have a closely in-tacked level of naturalistic intelligence.

4.4. Academic Performance after the Implementation of Vegetable Planting Activities

Table 5. Mean level of academic performance after the implementation of the vegetable planting activities

Academic Standing	Frequency	Percentage	Mean	SD
Outstanding (90-100)	18	47.37	92.50	2.46
Very Satisfactory (85-89)	10	26.32	87.40	1.51
Satisfactory (80-84)	10	26.32	82.90	0.99
Overall	**38**	**100**	**88.63**	**4.49**

The table above displays the academic performance of the thirty-eight ABM 11 Vibrant learners of Talangan Integrated National High School during the third quarter of the school year 2022-2023, when the environment awareness activities were implemented alongside learning. It can be seen that there were eighteen learners having a general average of between 90 and 100, ten learners between 85 and 89, while ten learners between 80 and 84. The overall general average of the learners was 88.63 with a standard deviation of 4.49.

4.5. Difference in Naturalistic Intelligence before and after the Activities

Table 6. Paired t-test result of the naturalistic intelligence level before and after the vegetable planting activities

Activities	Mean	SD	t-value	t-crit	p-value	Decision
Contact	Before = 4.05 After = 4.34	Before = 0.80 After = 0.63	2.224177	2.0273	.03232	Significant
Observation	Before = 4.03 After = 4.26	Before = 0.91 After = 0.79	1.503957	2.0273	.14108	Not Significant

Exploration	Before = 3.47 After = 4.21	Before = 1.08 After = 0.87	5.098317	2.0273	.00001	Significant
Classification	Before = 3.11 After = 3.53	Before = 0.89 After = 0.89	2.658695	2.0273	.01152	Significant
Hobby	Before = 3.00 After = 3.79	Before = 0.96 After = 0.87	7.328689	2.0273	.000009	Significant
Overall	Before = 3.53 After = 4.03	Before = 0.93 After = 0.81	6.56741	2.0273	.000009	Significant

alpha = 0.05

The table above highlights the paired t-test result of the naturalistic intelligence level before and after the implementation of environmental awareness activities alongside learning. It can be seen that in all activities that form part of naturalistic intelligence, all aspects increase in level. Nevertheless, not all increase were seen to be significant. With the exception of Observation, the other four aspects significantly increase in naturalistic level. This is evident by the t-values being greater than the t-critical. They are also supported by the p-values which are all less than the alpha value (0.05), again, with the exception of Observation. Overall, the naturalistic intelligence of the ABM 11 Vibrant learners of Talangan Integrated National High School significantly increased with the implementation of the 5-week activities fostering environmental awareness. With 95% level of confidence, there is enough evidence to claim that planting and nurturing vegetables helped in significantly increasing the naturalistic intelligence of the learners in the aspect of contact, exploration, classification and hobby, as well as the overall, collective naturalistic ability of the learners. It is interesting to note, too, that in general, the standard deviation decreases when the before and after status is compared. This means that the naturalistic intelligence level of the ABM 11 Vibrant learners became more closely in-tacked after the conduct of the 5-week planting activities.

4.6. Difference in Academic Performance before and after the Activities

Table 7. Paired t-test result of the academic performance before and after the vegetable planting activities

Mean	SD	t-value	t-crit	p-value	Decision
Before = 85.79 After = 88.63	Before = 4.30 After = 4.49	6.356806	2.0273	0.000009	Significant

alpha = 0.05

The table displays the paired t-test result of the academic performance of learners before and after the implementation of the 5-week vegetable planting activities. It can be seen that there was a 2.84 increase in the general average from second quarter to third quarter. This increase was seen to be significant through the t-value (6.356806) being greater than the t-critical (2.0273). This is supported by the p-value (0.000009) which is lower than the alpha value (0.05). With 95% level of confidence, there is enough evidence to claim that the environmental activities significantly increased the academic performance of the learners.

The result of this study is in consonance with the findings of the study made by Ahvan and Pour (2016) which revealed that seven out of eight multiple intelligences have significant positive relationship with academic performance, and these seven includes the naturalistic intelligence.

4.7. Nurturing Naturalistic Intelligence through Contact

Seven teachers, seven learners and seven parents were asked the qualitative question: "How can naturalistic intelligence be nurtured through contact in the immediate environment of a person?" Fifteen frequently appearing words were seen in their responses, and they were presented in the table that follows:

Table 8. Frequently appearing words from the qualitative responses regarding nurturing naturalistic intelligence through contact

Frequency	Word
9	environment
6	things
5	aware
5	nature
4	curiosity
4	around
4	contact
3	helps
3	able
3	grow
2	close
2	various
2	plants
2	naturalistic
2	intelligence

The figure next page is the associated word cloud of the frequently appearing words. The words "things", "aware" and "curiosity" are the ones striking and that which formulates the following sub-themes:

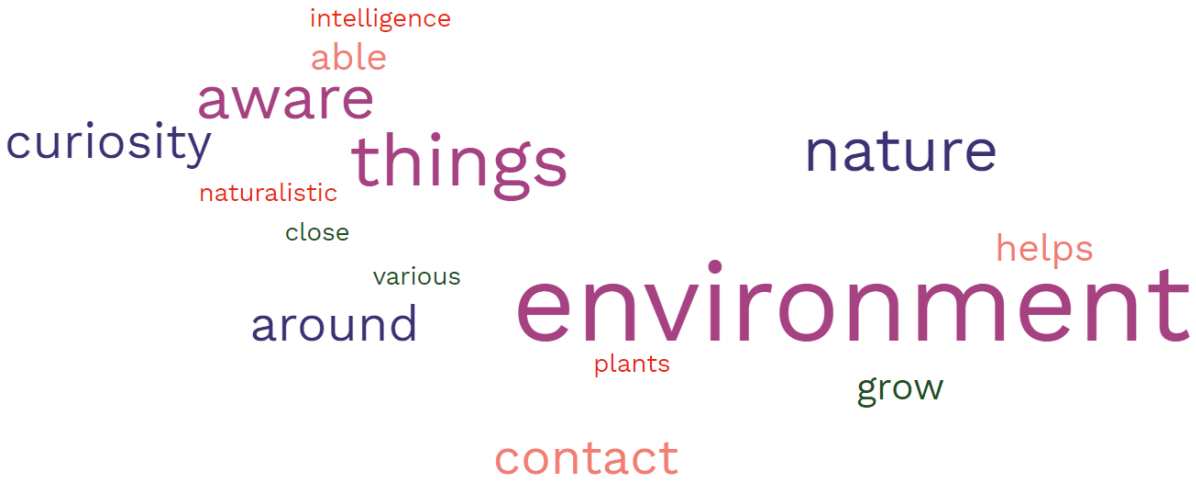

Fig. 3. Word cloud for nurturing naturalistic intelligence through contract

1. The beginning of contact to the environment is simply looking at the **things** around us, whether we have interest to them or none.
2. **Awareness** results in having the knowledge of the things around us that may have direct or indirect relation or effect in our lives.
3. Awareness breeds **curiosity** on how those things around us contribute on our well-being.

With these three concepts, the first theme is thus laid down here:

> ***Contact with things around us creates awareness and later breeds curiosity.***

4.8. Nurturing Naturalistic Intelligence through Observation

Seven teachers, seven learners and seven parents were asked the second qualitative question: "How can naturalistic intelligence be nurtured through observation?" Fifteen frequently appearing words were seen in their responses, and they were presented in the table that follows:

Table 9. Frequently appearing words from the qualitative responses regarding nurturing naturalistic intelligence through observation

Frequency	Word
5	helps
4	things
4	observing
4	plant
3	observe
3	able
3	nature
3	know
3	grow
2	observation
2	activity
2	keen
2	environment
2	aware
2	around

The figure below is the associated word cloud of the frequently appearing words. The words “helps”, “grow” and “keen” are the ones striking and that which formulates the following sub-themes:

Fig. 4. Word cloud for nurturing naturalistic intelligence through observation

1. Observation of the things around us **helps** naturalistic intelligence to be raised.
2. Things that **grow** like plants and animals are interesting to be observed because of the life they radiate.

3. **Keen** observation will result in to gathering of fruitful information about the subject being scrutinized.

With these three concepts, the second theme is thus laid down here:

Keen observation of how living things grow helps in forming environmental inclination.

4.9. Nurturing Naturalistic Intelligence through Exploration

Seven teachers, seven learners and seven parents were asked the third qualitative question: "How can naturalistic intelligence be nurtured through exploration?" Fifteen frequently appearing words were seen in their responses, and they were presented in the table that follows:

Table 10. Frequently appearing words from the qualitative responses regarding nurturing naturalistic intelligence through exploration

Frequency	Word
6	knowledge
5	things
5	different
4	helps
4	learn
4	information
3	environment
3	know
3	plants
3	grow
3	gain
2	sense
2	curiosity
2	activity
2	eagerness

The figure on the next page is the associated word cloud of the frequently appearing words. The words "knowledge", "different" and "information" are the ones striking and that which formulates the following sub-themes:

Fig. 5. Word cloud for nurturing naturalistic intelligence through exploration

1. **Knowledge** is intensified when a person explores the things in the immediate environment.
2. **Different** gadgets or utilities can be used to deepen the search for knowledge.
3. New and first-hand **information** can be revealed to a person when he takes time to investigate.

With these three concepts, the third theme is thus laid down here:

Knowledge and different information are available through environment exploration.

4.10. Nurturing Naturalistic Intelligence through Classification

Seven teachers, seven learners and seven parents were asked the fourth qualitative question: "How can naturalistic intelligence be nurtured through classification?" Fifteen frequently appearing words were seen in their responses, and they were presented in the table that follows:

Table 11. Frequently appearing words from the qualitative responses regarding nurturing naturalistic intelligence through classification

Frequency	Word
7	helps
6	animals
5	plants
4	know
4	classify
3	different
3	help
3	knowledge
3	categorize
3	characteristics
3	identify
3	kind
3	naturalistic
2	determine
2	every

The figure below is the associated word cloud of the frequently appearing words. The words "characteristics", "kind" and "identify" are the ones striking and that which formulates the following sub-themes:

Fig. 6. Word cloud for nurturing naturalistic intelligence through classification

1. It is interesting to note the **characteristics** of the living things in our environment.

2. Different **kinds** of species lead us to the awe-inspiring creation around us.
3. **Identifying** the taxonomy of the living things in our surrounding gives us sense of belongingness.

With these three concepts, the fourth theme is thus laid down here:

Identifying the characteristics and classification of different kinds of life form discloses inspiring creation.

4.11. Nurturing Naturalistic Intelligence through Hobby

Seven teachers, seven learners and seven parents were asked the fourth qualitative question: "How can naturalistic intelligence be nurtured through hobby formation?" Fifteen frequently appearing words were seen in their responses, and they were presented in the table that follows:

Table 12. Frequently appearing words from the qualitative responses regarding nurturing naturalistic intelligence through hobby

Frequency	Word
8	hobby
8	planting
5	develop
4	activity
4	nature
3	important
3	skills
3	knowledge
3	habit
3	home
2	encouraged
2	things
2	opportunities
2	five
2	experienced

The figure next page is the associated word cloud of the frequently appearing words. The words "develop", "home" and "important" are the ones striking and that which formulates the following sub-themes:

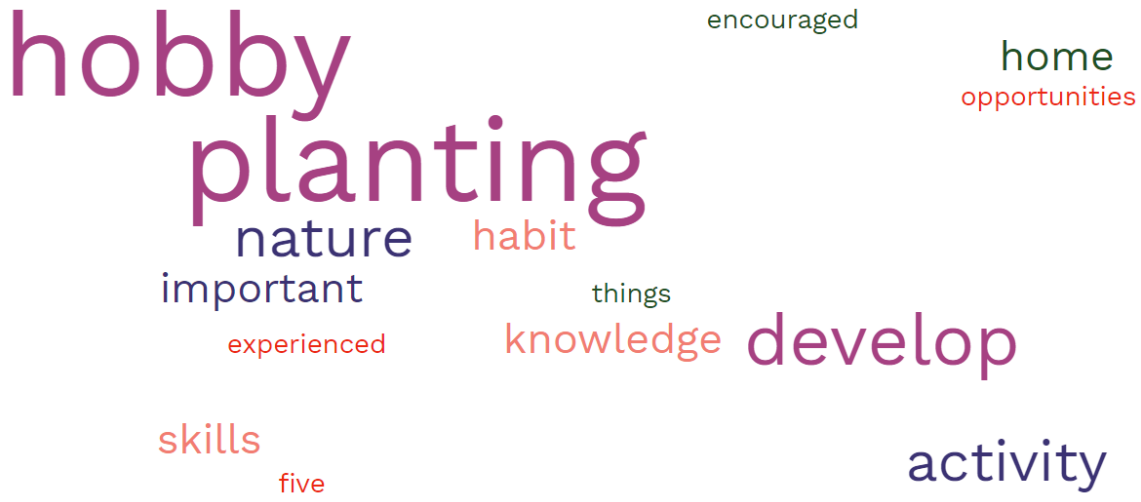

Fig. 7. Word cloud for nurturing naturalistic intelligence through hobby

1. **Development** of habit makes an ability or skill deeply rooted in one's personality.
2. Knowledge or skill from school brought at **home** will develop into lifelong learning.
3. When a person sees the **importance** of a lesson, it will be remembered and applied even outside the school.

With these three concepts, the fifth theme is thus laid down here:

Development of hobby in personal life is possible when the importance of an ability is realized.

5. Recommendations and Reflection

5.1. Recommendations

Through the findings revealed in this study, the following recommendations to the target people and group of people are enumerated here:

1. **School heads and officials** should continue promoting the Gulayan sa Paaralan Project, not just as a school activity, but preferably to be brought down to the classroom level, knowing that raising the naturalistic intelligence can benefit the learners' academic performance.

2. **Teachers and advisers** should find ways to make planting vegetable an extra-curricular activity, if not a lesson integration, so as to heighten learners' naturalistic intelligence.
3. **DepEd Officials** should launch seminars and conferences connected to environmental awareness, leading to nurturing teachers and learners' naturalistic intelligence.
4. **Family and community** should seek ways on how the youth of today become involve in environmental activities. Parents may imbibe vegetable planting at home with their children so as to train them in valuing nature's resources and inculcate health and economical living. Community officials can launch project involving youth, teaching them to nurture plants and vegetable that will ultimately lead for them to become business men and women in small ways.

5.2. Reflection

The conduct of this study amazed the author on how the awakening of the learners' naturalistic intelligence favored the increase of their academic performance. The holistic development of learners is still a call for educators today, that is, to touch not just the learners' head but their heart as well. Learners might forget what we teach academically, but they will long remember us on how we touch their lives through the example we show them, whether in the four corners of the classroom, or in the society where we are moving as living testament.

The American poet Joyce Kilmer once wrote, *"I think I shall never see a poem as love as a tree; A* tree whose hungry m*outh is pressed against the earth's sweet flowing breast; A tree that looks at God a*ll day and lifts her leafy *arms to pray."* We might be able to ask why the American writer has that inspiring-awe of the poetic persona in his masterpiece. As for the author of this study, it is because he realized the importance of God's creation, the connection of the things around him, and the purpose of life. This is the reason why he is able to connect the things he saw in his environment to the communion with God Almighty. It is on this note that the author of this study would like to leave insight that only when we are able to realize the importance of the things around us, that they are placed there long before we exist for our enjoyment and sustenance, only then, can we find ourselves' worth and be able to perform in our utmost.

E.A.P.

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