

Ecological Awareness and Practices Text Analytics: A Prelude to Retooling Teachers

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ABSTRACT

Retooling teachers improve the quality of education and open the door for employability. It is a remedy to cope up with the fast-changing times. This study aimed to generate an analysis of the awareness and practices in the ecology of Graduate school students. Specifically, it achieved the following objectives: a) Determined the student's statements on ecological awareness and practices through paragraph writing; b) Generated the statistics, trends, and cirrus using various free online text analysis tools; and c) Developed an instructional

material using a formed word cloud. This study mines the paragraphs that form a document of 54 graduate school students in the research methodology class. These students as respondents are private and public school teachers. The documents are dissected and grouped into: a) number of words is 12407; b) lexical density is 15.1769; c) number of sentences is 841; and d) number of syllables is 20283. The study found out that retooling teachers on ecological practices are necessary. The teachers do not practice all of the 5Rs. The common ecological practices of the teachers are recycle, reduce and reuse. Teachers are aware of the waste and garbage problems but have decreasing attention in protecting and saving the environment. An instructional material can be developed using formed word cloud from the prominent words used by the respondents in their statements on ecological awareness and practices. The study recommends that the teachers should undergo intensive training, orientation, and information drive on the practice of 5R.

KEYWORDS

Ecological Awareness, Ecological Practices, Text Mining, Retooling Teachers, Philippines

INTRODUCTION

Retooling teachers improves the quality of education and opens the door for employability. It is a remedy to cope up with fast changing times. Retraining of teachers acquaint them with modern tools through continuing education and training. According to Chesley & Jordan (2012), only through radical retooling will teacher training programs produce graduates who can meet the professional opportunities. Moreover, Valderama, (2016) claimed that pedagogical retooling of teachers improves quality standards in teaching. Aside from this, Rogayan, & Eveyen El Elyonna (2019) stressed the need to retool the teachers because through them, the school, play a very critical role to grow an environmentally-aware and ecologically-conscious students. Moreover, teachers play an influential role in developing new patterns of performances for individuals says Said et al. (2003).

Ecological awareness is to distinguish and comprehend what is happening in and around (ycocedron, 2018). Ecological practices refer to the individual activities or conducts that has impact on the environment. Today, ecological changes steadily and adversely affects the lives of people. Researchers like Rogayan

& veyen El Elyonna (2019) began to gain understanding on how environmental concepts, state of the environment, ecological issues and problems or ecological awareness and practices are taught among students) while Yatsuka & Higashibara (2010) began understanding on the practices of teachers by using text mining tools. According to Fan et al., (2006) text mining offers understanding of an unstructured data in digital textual formats. Mhamdi et al., (2018) further stated that text mining plays a significant role in transforming the unstructured text into informative knowledge with various interesting patterns called word cloud. Word clouds according to Heimerl et al. (2014), are a straightforward and visually attractive picturing way for text. They are used in various contexts as a means to provide an overview by distilling text down to those words that appear with highest frequency. Information extracted from these textual data sources is valuable for a range of enterprise application and for informed decision making (Ittoo & van den Bosch, 2016). Thus, the study used text analytics to understand the ecological awareness and practices of the respondents and to determine whether teachers should or should not undergo retooling.

OBJECTIVES OF THE STUDY

This study aimed to generate an analysis on the awareness and practices on ecology of Graduates school students. Specifically, it achieved the following objectives:

1. Determined the students statement on ecological awareness and practices through paragraph writing;
2. Generated the statistics, trends, and cirrus among words using various free online text analysis tools; and
3. Developed an instructional material using formed word cloud.

METHODOLOGY

This study mined the paragraphs that forms a document of the 54 graduate school students. These students as respondents are private and public school teachers. The document is dissected and grouped into: a) number of words is 12407; b) lexical density is 15.1769; c) number of sentences is 841; and d) number of syllables is 20283. The statistics, trends and cirrus among words were generated using various free online text analysis tools to determine the ecological awareness and practices of the respondents. The paragraphs of the 54 respondents was submitted to the online text analyzers where Text analyzer; Textalyser; and

Voyant was used. Text analyzer was used to find the most frequent phrases and words, number of words, lexical density, sentences and syllables. Textalyser was used to generate statistics word groups, keyword density, the prominence of word or expression, and word count. Voyant was used to generate the cirrus and trends. Cirrus is a word cloud outlook of the most frequently occurring words in the corpus or document while Trends display a line graph of the comparative occurrences in the document.

The determination of the statistics, trends, and cirrus among words found on the students' paragraphs was primarily to look on the expression count and prominence of the words refuse, reduce, reuse, repurpose, and recycle (5Rs). To interpret the prominence of words, the Likert Scale below was used.

Table 1. Likert Scale of the prominent words used in the paragraphs

Range	Descriptive Interpretation	Recommendation
75-100	Highly Aware (HA) and Highly Practicing (HP)	Retooling is not necessary
50-74.99	Moderately Aware (MA) and Moderately Practicing (MP)	Retooling is not necessary
25.49.99	Slightly Aware (SA) and Slightly Practicing (SP)	Retooling is necessary
0-24.99	Not Aware (NA) and Not Practicing (NA)	Retooling is necessary

To develop an instructional material using formed word cloud, the researchers composed a poem by knitting the most prominent words.

RESULTS AND DISCUSSION

On GS Student's Statement on Ecological Awareness and Practices

Table 2. Sample Paragraphs of the Graduate School Students

Respondent#	Paragraphs
1	As a public school teacher I use recycled papers for my activity sheets instead of throwing and burning. I put plastic bottles to the moral recovery facility for recycling and reuse to reduce garbage. I decompose biodegradable waste and use it as fertilizer for the plants. I don't burn garbage to lessen ozone layer and avoid using motorcycle in going to near places. At home I also practice energy conservation. Turning off the electrical gadgets and switching of lights if not being used. Climate change affects us so much therefore we should take an action.

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- 2 The practices we do to save our ecosystem is the practice of waste segregation. Garbage bins are evident in the community like Plaza market school and church. We also practice recycling of plastics thus making it into decorative flowers and lanterns. Another one is the practice of using eco bag and reusable bags instead of plastics in going to market to minimize garbage. Burning of garbage is discouraged to protect the ozone layer. Compost pit is encouraged to every household in support to the waste management campaign and advocacy of the local government. The local concern agencies conduct clean up drive weekly to keep the barangay and community safe from pollution and overcrowding of garbage. Therefore proper disposal of waste is encouraged to everyone.
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- 3 Environment satisfies the needs of all living things. Plants and animals depend on it. Human being also depends on what it can give. Environment and human are interrelated but now people have changed because of greed and abuse. Our environment is no longer safe due to climate change and global warming. These are due to the actions and abuse practices of the people. Our nature and mother earth is being sacrificed. Some are trying to restore and still protect the nature. The 3Rs is launched to reduce the use of materials that could harm the air we breathe and our health due to some foods that we eat. Avoid using plastic bag and smoke emission using of vehicles. Reuse also the plastics and bottles before disposing them. Recycle some waste and convert into an income and as decorations. The moral recovery facility is also evident for the waste segregation program of the government. Avoid throwing of garbage particularly the drainage canals rivers and creeks. Another program is the clean and green. Planting of trees and gardening is encouraged to reforest the environment. To save and protect our dying nature let us keep it clean and safe to everyone.
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Table 2 presents the sample paragraphs on the awareness and practices on ecology of the 54 Graduate School students of Abra State Institute of Sciences and Technology during the first semester of the school year 2019-2020.

The Statistics, Trends and Cirrus among Words using Various Free Online Text Analysis Tools

Table 3. Statistics of prominent words on student paragraphs

Expression	Expression count	Frequency	Prominence
recycle	25	0.2%	36.9
reduce	23	0.2%	32.9
Reuse	18	0.1%	29.9
recycling	13	0.1%	34.8
recycled	7	0.1%	27.8
recyclable	7	0.1%	36.5
reused	3	0%	46
reusable	2	0%	25.4

As gleaned in the Table 3, shows the expressions count, frequency and prominence of the keywords refuse, reduce, reuse, repurpose, and recycle. As reflected on the table regarding the 5Rs, only recycle reduce and reused was commonly and frequently used. The highest expression count of the words: recycle is 25, while reduce is 23, and reused is 3. The highest prominence of the keyword words is 36.9, 32.9, and 46 respectively. This means that retooling teachers is necessary. The teachers need to be reoriented on the concepts of the 5Rs most especially in their teaching strategies that includes 5Rs as they play a critical role in educating student on sound ecological practices, and as teachers often align teaching strategies with their own knowledge and beliefs (Waters-Adams, 2006). In addition, teachers need to be reoriented especially if they are assigned as an adviser of the Youth for the Environment Clubs in schools to ensure that student are aware on the prevailing issues and concerns relative to environment or ecology (DepEd, 2003). Furthermore, the National Environment Awareness and Education Act of 2008, declares that the primary implementers are the Department of Education (DepEd), the Commission on Higher Education (CHED), the Technical Education and Skills Development Authority (TESDA) and other agencies promoting national awareness on the role of natural resources in economic growth and the importance of environmental conservation and ecological balance towards sustained national development (lawphil, 2020).

To have an additional view of the statements of the teacher respondents, the word trend is presented in Figure 1.

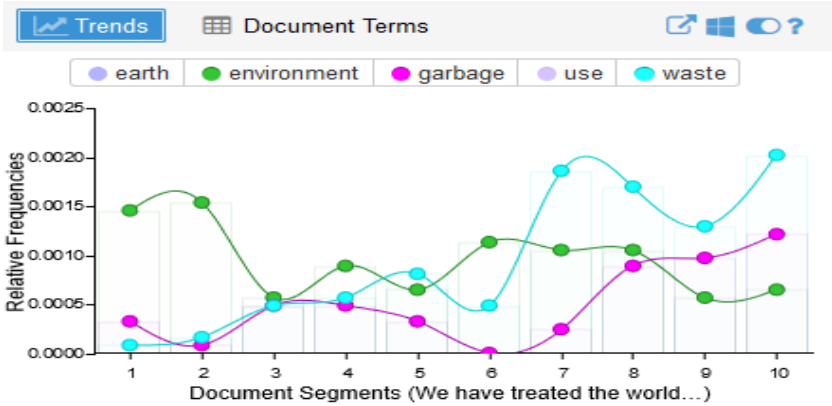


Figure 1. Word Trend on the Paragraphs of the respondents

As shown in Figure 1, the most trending words as to frequency of occurrence, it appears that the words waste and garbage words are trending while the word environment is down trending. This means that teachers are aware of the waste and garbage problems but have decreasing attention on the practice in protecting and saving the environment.

Finally, to provide a picture of the most frequently used words in the paragraphs on ecology, thus, the formed word cloud is shown below.



Figure 2. Word Cloud of the most frequently used words

As shown in Figure 2, we can see words that are familiar when it comes to environmental awareness and practices. Words like garbage, save, segregation and recycle are prominent. This means that teachers are aware of the things to be done in taking good care of the environment. However, practicing them remain to be in question as the prominence of the words like refuse, reduce, reuse, repurpose, and recycle still remains to be seen.

On Developed an Instructional Material using Formed Word Cloud

The developed instructional material using formed word cloud is a poem composed and written by the researchers. It tells about the present condition of the mother earth. It is about what humanity or individual can do to help protect and save the ecosystem. It is all about awareness and practice of saving and caring the Mother Earth as presented below.

OH! MOTHER EARTH...

How wonderful and lovely to see
The earth with clean and fresh air to breathe
The beautiful and robust trees
That makes our community safe and free.

Oh! Mother Earth,
How awesome to dwell
Heaven's gift that needs protection and care
Proper waste disposal and management
Providing bin and compost pit in our place.

Health is wealth, as they say...
Observe sanitation and hygiene
Support and abide the Clean Air Act
Practice the 5Rs in our daily lives
Protect our land, air, water and seas.

Oh! Mother Earth.
Segregation of biodegradable and non-degradable waste
Use environment friendly eco-bags
Refuse the use of disposable objects and plastic bags
Reduce non-biodegradable materials
Recycle and repurpose things to beautify our ever dearest land

CONCLUSION

The teachers do not practice all of the 5Rs. The common ecological practices of the teachers are recycle, reduce and reuse. Teachers are aware of the waste and garbage problems but have decreasing attention in protecting and saving the environment. An instructional material can be developed using formed word cloud from the prominent words used by the respondents in their statements on ecological awareness and practices.

RECOMMENDATION

The study recommends that the teachers should undergo intensive training, orientation and information drive on the practice of 5R. Teachers should include in the teaching strategies the awareness and practices on ecology. Utilization of the formed word cloud and the adoption of the composed poem.

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