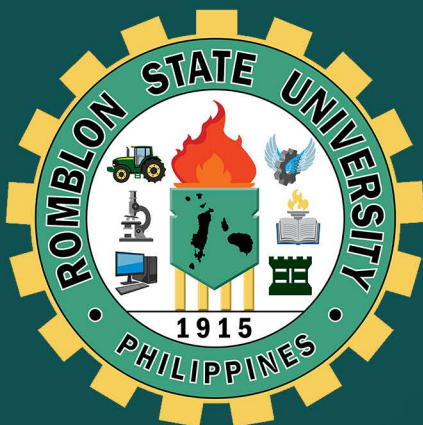




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Grammaticalization and Lexicalization: A Discourse Analysis of Modality Expressed in English and Romblomanon in Classroom Interaction and Conversation

Orlando L. Mindoro

ABSTRACT

The Romblomanon language profoundly influenced the learning process of acquiring English as a second language. In this study, the researcher focused on how Romblomanon learners expressed modality in English, which can be defined by grammaticalization (mood, tense, aspect, among others) and lexicalization (modal verbs, modal adverbs, modal adjectives, among others). Romblomanon modality can also be expressed in three universal semantic roles: agent, theme, and location. This study used the qualitative discourse analysis method using the descriptive and contrastive approach to identify English and Romblomanon modals expressed in actual classroom interaction and conversation of Romblomanon students. The recorded conversation and interaction from the two subjects of the students majoring in English enrolled at Romblon State University-Romblon Campus were transcribed and analyzed based on their epistemic and deontic meanings. Results showed that many Romblomanon English learners constructed their statement in Romblomanon and translated it literally to English statements. It was concluded that the Romblomanon English learners are deeply influenced by their native tongue, resulting in the misuse of modality.

Keywords: *deontic modality, discourse analysis, epistemic, grammaticalization, lexicalization, and modals*

INTRODUCTION

Robust theories in modern linguistics (Palmer, 2001) assert that for each grammatical category of language, lexical item, and syntactic construction, one can develop a set of necessary and sufficient criteria that allow for proper usage of the form. However, depending on the interaction of the item's meaning with the features of the given context, the interpretation of the form in question would be predictable in different contexts. The essence itself would be invariable. So, a distinction arises between the context, independent meaning, and interpretation fostered from the form in terms of varying communicative atmosphere, social and psychological conditions of communication, syntactic environment, topical contexts, and stylistic preferences. Although the distinction between meaning and implicature is critical for a precise semantic analysis of linguistic items,

making the distinction in practice is more complex. It frequently necessitates the construction of subtle situations to distinguish between a form's meaning and its implicature. One can find this claim in the implicit interpretation of negative expressions mapped by mood forms when it comes to modality, which is a language concept that deals with the representation of possibility and necessity.

The mood represented in English modality through modal terms can confuse English students (Nguyen, 2011). To some extent, modality is a complicated problem in both English and Romblomanon. It has been the subject of various studies in teaching and learning a foreign language.

Fintel and Gillies (2006) defined modality as a linguistic meaning related to the expression of possibility and necessity. A modality sentence locates an underlying or pre-adjacent proposition in the space of possibilities (medieval logicians introduced the term pre-adjacent). It is a classification of proposals based on whether they claim necessity, chance, or impossibility (Nguyen, 2011).

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In both the English and Romblomanon languages, the following types of modality are noticeable: epistemic and deontic. The term epistemic modality (Greek: episteme, 'knowledge') refers to what is feasible or necessary given what is known and the evidence available (Fintel & Gillies, 2006). It concerns the speaker's judgment of the proposition's truth embedded in the statement. Deontic modality (Greek: deon, 'duty') is concerned with what is possible, required, permissible, or obligatory in the context of a body of law, a set of moral principles, or anything similar (Fintel & Gillies, 2006). This modality is concerned with "influencing actions, states, or events" (Palmer, 2001).

The researcher starts working on this study, hoping that this will be useful for English learners and further studies on English modality. This study looked at English modality in terms of grammaticalization and lexicalization. Then, comparing it to Romblomanon and identifying different modal expressions in English and their Romblomanon equivalents gives language teachers and learners some tips on using the English modality better.

From the researcher's teaching and translating experience, it was difficult for Romblomanon learners to accurately use the English modality to express an appropriate degree of probability or obligation, especially when using text types involving making judgments. The modals "basi" (might), "siguro" (maybe or might be), and "dapat" (should) are some of the Romblomanon words used before verbs to denote likelihood or duty. Other modalities in Romblomanon are expressed by adding suffixes and prefixes to the verb. However, some of these words may mean another thing when used in some construction of statements. In order to assess English and Romblomanon modality, grammaticalization and lexicalization are utilized.

This paper answers the following questions: (a) What are the grammaticalization and lexicalization denoting modality in English and Romblomanon?; (b) What similarities and differences in grammaticalization and lexicalization signify modality between English and Romblomanon?; and (c) What are the features of the Romblomanon language that influenced the students' construction of English language modality? Answers to these questions suggest language teachers and learners use the English modality better.

METHODOLOGY

This study of English and Romblomanon modality is evaluated through grammaticalization and lexicalization based on its epistemic and deontic meaning. The two processes are similar in many respects: both affect syntax, not just individual items, and involve semantic erosion, fusion, and fixing of the

component elements. The recent realization is that it can be difficult to distinguish between grammaticalization and lexicalization. It has coincided with many studies of language change's recent 'constructional' shift. It has correctly warned analysts that grammaticalization and lexicalization entail the production of a new conventionalized form-meaning. Pairing is part of a more significant shift in the new linguistic sign's context (Boye & Harder, 2012). According to Lehmann (2002), "lexicalization and grammaticalization are processes that have much in common and are, to a certain parallel". De-grammaticalization is the inverse of grammaticalization, while folk etymology is the inverse of lexicalization. Romblomanon lexicon of modals greatly influenced the construction of English statements made by Romblomanon English learners.

This study used a qualitative discourse analysis method using the descriptive and contrastive approach to identify English and Romblomanon modals expressed in actual classroom interaction and conversation of Romblomanon students who learn English as a second language (L2). The discussion and interaction are recorded during their classes in two English subjects at Romblon State University-Romblon campus. The recorded conversation and interaction are transcribed and evaluated grammatically and lexically based on their epistemic and deontic significance. The students are informed that they are being recorded for the language used for conversation purposes only. Grades and correct or wrong answers are not included.

RESULTS AND DISCUSSION

Extract 1 is taken from "Teaching Strategy in English Grammar" with 3rd year college English major students at Romblon State University-Romblon Campus. There is a total of 35 students enrolled in the subject.

The extract shows that the exchange happens inside the classroom where a teacher discusses a topic. The atmosphere inside the classroom could also be noticed through the language used by students in exchanging conversations and answering the teacher's questions. The frequent mentioning or frequent calling of "ma'am" denotes that some students actively participated in the class and tried to answer every question asked by the teacher even if they were not asked to do so. The teacher in the classroom has not strictly implemented her power as the superior inside the classroom. In the case of student #2 (S2), this student has performed more exchange than other students and does leading action toward the others. The frequent reciting and volunteering of the said student signifies that he is leading on the said subject, which means that this kid assumes he is an authority on the subject that the teacher is discussing.

On the other hand, if the focus is on the interaction's exchange progress, it is noticeable that the structure follows a pattern. Since this is a classroom discussion, it has an order in the interaction. Lines [1] to [39] are the exchanges where the teacher gave students an activity to arrange the pictures and develop sentences from the placement of the images. This activity is simply denoting "Motivation." Before the teacher delivered the lesson, she used motivation as a springboard toward her main topic, verb. The reading of the story of Cinderella is a transitional activity to connect her motivation to the main lesson. Those are lines 40 to 57. After the teacher finished discussing the main topic, she gave a quiz to evaluate the students' extent of learning (Lines 58 to 104). The statements show that the exchange follows the typical classroom learning pattern: motivation, discussion, and evaluation.

In some instances, the researcher notices that some exchanges are in Romblomanon. The students use this language when conversing with one another. This means they are more comfortable using Romblomanon when talking with fellow students.

This study is more concerned about how the students and teacher express modality in their interaction.

In line [1] of extract one, the teacher states the modality "will" to simply inform the students that they will be provided an activity. The teacher expressed this line:

[1] T: I will give you an activity to do. These are pictures.

This line could be translated into the Romblomanon language in two ways:

"*Matao ako ning trabahuon na himuon nindo. Mga litrato ini.*"

"*Taw-an ko kamo trabahuon na himuon. Mga litrato ini.*"

In line one [1], the modal "will" used by the teacher denotes a future action that should be performed with seriousness. The Romblomanon equivalent "*Matao*" in the first translation, etymologically derived from the Romblomanon verb "*tao*" and prefix "*ma*", makes the sentence a futuristic idea of giving. The prefix "*ma*" is used for the proposed action. The affixation indicates the focus and imperfect aspect of the movement (Law, 1997). It was followed by the pronoun "*ako*" as the sentence's subject. The second translation verb, "*taw-an*", which is etymologically derived from "*tao*" and "*an*", also denotes a future action. The only difference is the focus of the action, which is the receiver of the action, "*kamo*". The direction of the second translation is the receiver rather than the doer of the action. It is the passive form of the sentence. Many Romblomanon English learners used the translation

interchangeably without knowing the sentence's structure and meaning.

[2] T: You should finish this in 5 minutes.

Line two also contains a modal "should", which denotes obligation but is less robust than the other modal "must". The agent's purpose of the statement is to force the students to finish the activity in five minutes which employs necessity. "Should" is frequently used to express a preference or an idea, as well as to express an opinion or a suggestion. According to Biber et al. (1999), "should" usually mark an "obligation" rather than "logical necessity." It means that like "should", "obligation" meaning of must is more dominant over its "necessity" meaning.

However, this finding is in contrast with the results of Biber et al. (1999) and Leech et al. (2009), who reported that "obligation" or "must" is not favored in modern English probably because of its force nature.

In the Romblomanon translation [*Kailangan tapuson ini sa lima ka minuto.*], the language put an additional word "*kailangan*" as adverb to signal the obligation of the verb "*tapuson*". This verb originates from the root verb "*tapos*". "*On*" is affixed to the main verb "*tapos*" to denote obligation but not a necessity. To make the statement as forceful as necessary in the case of "must," an additional word as an adverb is added after the first adverb, "*kailangan*". "*Gid*" is being added before the main verb "*tapuson*". [*Kailangan gid tapuson ini sa lima ka minuto.*]

Another citing of modals in extract one is located on line seven. The teacher uses the modal "can" to tell the students where to write their answers. If we analyze the statement, the teacher here allows the students to write their answers on the board and not request students to show their ability to report on the board.

[7] T: You can write on the board your sentences

When this statement is translated to the Romblomanon language, this will go as: [*Kaya nindo sulaton ang indo pangungusap sa pisara*]. The idea now becomes different from what the teacher would like to emphasize because "can" is not an appropriate modal in the statement. If we follow the agent's target meaning, the sentence should be translated as: [*Pwede nindo sulaton ang indo pangungusap sa pisara*]. The word "*pwede*" is used instead of "*kaya*". "*Pwede*" means you are allowing someone to do something, and you permitted it, while "*kaya*" means asking someone to show some ability to do the action.

In Romblomanon language, the verb "to write" is translated as "*sulaton*" from the root word "*sulat*" which is a noun with English translation as "*letter*" but when it is used as a verb, "*sulat*" is translated as "to write".

[36]T: ok, group one, what can you say?

Another modal in the exchange appears in Line 36. This time, "can" is used to ask a question to know

students' ability to say something about what they have observed in the previous action.

Students' modality in Romblomanon language is also cited in Line 62. If we are going to analyze the statement in Romblomanon language, it could be interpreted in two meanings:

[62] S2: *basi bukon*.

First meaning:

[why is it not] – when it is considered as a question.

Second meaning:

[it might be not] – when considered a statement was, which signals possibility.

The exchanged lines could support this confusion of the meaning before and after the speaker uttered the statement. It will prove what the speaker meant when he spoke the sentence.

[58] T: ok, now what do you think is the underlined word in the story?

[59] S2: mam

[60] T: yes Genelyn

[61] S9: I think, ma'am the underlined words are all examples of verbs

[62] S2: *basi bukon*

[63] T: ok.

[64] T: who can give or who has an idea about a verb?

The teacher asked a question about the underlined term in Line 58. S2 attempted to respond, but the teacher identified S9 to address the query regarding her guess on the underlined word in Line 60. S9 provides her response on Line 61, but S2 comments on S9's response in Line 62. The statement by S2 shows that "*basi bukon*" refers to the possibility that the answer of S9 could be wrong. So "*basi*" here is translated as "might" and not "why." It is followed by Line 63 which is the approval of the answer and is supported in Line 64 as a follow-up question about the answer. It means that the response of S9 is correct, contrary to the response of S2.

This second Romblomanon statement made by S1 is another Romblomanon modality expressed in Line 81. A confusion of guess that could be translated as [It might be the "is" and "was"]. This is an optimistic guess toward the probable answer.

[79] S13: linking verb

[80] T: ok. What is a linking verb?

[81] S1: *daw imaw adto ang "is" kag "was"*

[82] S10: mam

[83] T: yes

[84] S10: linking verbs are verbs used to connect the subject to its complements

[85] T: yes, very good

[86] T: can you give me an example of linking verb

The two Romblomanon modalities expressed in Lines 62 and 81 are grammatically comparable except for their lexical meaning. The modal described in Line 62 lexically expects negative, confusing results for its guess, while the modality expressed in Line 81 expects positive confusing guess results.

Extract two is a transcription taken from the recorded video of the Educational Technology subject of second-year BSED students at Romblon State University, Romblon Campus, with 53 students. The interaction is made during the reporting activity inside the classroom. Students are conversing with the reporter who is acting as the teacher and vice versa.

During the reporting of the topic, the students seldom used modals since the focus is on the indicative mood of the action. Use of modals is only to emphasize the straightforward possibility and obligation of the action.

The first modal expressed in the extract is cited in Line 22 when the reporter is trying to ask students about their capacity to give the idea of how Google can help in their studies. The reporter used modality to solicit the idea of the individual learner.

[22] R1: Who can give a statement that Google can help in your studies?

[23] S1: Sir

[24] R1: Yes

[25] S1: Google helps us in doing our research

[26] R1: Yes, *nakakapagresearch tayo sa internet using google*.

[27] R1: Another, Yes

In the line [36], the reporter mentions in Romblomanon language "*Kung mapapansin nindo igwa kita nakikita na http*". This line signaled the modality in Romblomanon, which could be translated in English as "If you could have noticed, we can see the http." The Romblomanon verb "*mapapansin*" is derived from the verb "*pansin*" which means "to notice." This verb is affixed with "*mapa*" to make modals. "*Pa*" is causative while "*ma*" is the agent focus. Almost any verb may be made into a "causative" verb with the meaning that a causer causes, requests, or at least allows the agent i.e., causee, to do the action. The affix "*pa-*" is used in a causative construction. The causee is always oblique if it is not in focus. In the Romblomanon statement above, the root verb "*pansin*" is transitive. The non-causative verb already involves a causer "I". When a causative affix "*pa-*" is attached to the verb, one more role "you" is added. These derived causative forms represent actions or states which describe how an agent causes a person to be affected. With this derived verb, the agent causes or requests the person to affect the object "http" (Law, 1997).

[36] R1: *Kung manutisyan nindo igwa kita nakikita na http or hypertext transfer protocol then www yan yong world wide web*.

[37] R1: We have some application like skype. Do you think this app can help us in our studies?

[38] CHORUS: Yes

[39] R1: Very good, it will help us in our studies because it can connect people around the world and transfer of information is possible.

[40] R1: Now my topic will be continued by other member of the group.

The lines [37], [39], and [40] both expressed modality in simple way - to signal the weight of possibility and sureness of the action.

DISCUSSION

Extracts mentioned earlier contained 178 lines, 107 for extract 1 and 71 lines for extract 2. From these lines, only 22 lines were citing modal words. A summary of these modals is shown in Table 1.

Table 1. Summary of the number of Modals in two extracts

| Modals | Extract 1 | Extract 2 | Total | Percentage |
|--------------------|-----------|-----------|-------|------------|
| English | | | | |
| will | 2 | 4 | 6 | 27.27% |
| can | 7 | 1 | 8 | 36.36% |
| should | 1 | 1 | 2 | 9.09% |
| could | 1 | - | 1 | 4.54% |
| Romblomanon | | | | |
| daw imaw adto | 1 | - | 1 | 4.54% |
| basi bukon | - | 1 | 1 | 4.54% |
| makabulig | - | 1 | 1 | 4.54% |
| mapapansin | - | 1 | 1 | 4.54% |
| kaya | - | 1 | 1 | 4.54% |

Table 1 shows that "can" is most frequently used by teachers and students in classroom interaction with 36.36%, followed by the "will," "should," and "could". This result means the exchange always emphasizes the ability to do the action. However, if the exchange is looked at, this is only a simple modality that tells the future action without any intention or lexical meaning. There's a reason why many Romblomanon students write their statements in Romblomanon first, then convert them to English, which may cause a grammatical and lexical differences. They translated modals literally. Learners no longer adhere to the Romblomanon language's correct grammaticalization and lexicalization due to their actions. Because of their lexical and grammatical differences, Romblomanon modals could not be translated literally into English. As mentioned previously in this paper, they might be interpreted with a different meaning.

CONCLUSION

Learning a foreign language well is tough because it involves a considerable commitment of time and effort. In particular, teachers and learners of languages in general, of English and Romblomanon, should conduct wide-range studies of the language's modality. Teachers should explain the complexities of the four minor counterparts of cultural and linguistic contents: grammaticalization, lexicalization, epistemicity, and deonticity, as well as their more difficult use in advanced education.

In the case of Romblomanon learning English, learners' attention should be drawn to the following systematic ways of comprehending: (1) Grammatically, they should learn how to recognize the distinction of using English modal auxiliaries in different verbal categories; (2) Lexically, they should study and understand the specific cases of modal auxiliaries (i.e., their different meanings); and (3) In order to grasp modality firmly, learners are suggested to learn modal verbs in context because it is useless to memorize lists of modal verbs and their definitions out of context; notice how they are being used; pay attention to the language and how particular modal verbs are employed when reading, watching movies, or watching TV in English; try out some of the modal terms; and use them when speaking with teacher and inquire if they are used appropriately.

Learning a second language is a tough work. For most people, it involves considerably complex and concentrated efforts. For English speakers and learners of Romblomanon, they may feel at ease with the single meaning of a modal auxiliary verb. Still, mastering these verbs in their collocations is rather complicated to express their ideas in English.

In teaching English to Romblomanon students, the teaching of modal verbs should be done systematically and gradually (from beginners to immediate and advanced level students) so that they may master the use of these verbal clauses, among the other types of modalities (epistemic or deontic).

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AUTHOR'S CONTRIBUTIONS

The author confirms sole responsibility for the whole manuscript and study.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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Maikling Kwentong Hiligaynon: Isang Pagsasalin at Pagsusuring Moralistiko at Sosyolohikal

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ABSTRAK

Ang pag-aaral na ito ay nauukol sa pagsasalin at pagsusuri ng limang maikling kwentong Hiligaynon. Palarawan - pagsusuri ang ginamit na metodo sa pag-aaral na ito. Sa pamamagitan ng pamantayang binuo, pinili ng tatlong hurado ang limang maikling kwentong Hiligaynon na siyang isinalin sa wikang Filipino at sinuri ayon sa dulog moralistiko at sosyolohikal. Sa pamamagitan ng talatanungan, tiniyak ng tatlong tagataya ang kaangkupan ng pagsasalin. Batay sa kinalabasan ng pagtaya, napakaangkop ng ginawang pagsalin sa wikang Filipino ng limang maikling kwentong Hiligaynon. Nagtataglay rin ang mga ito ng bisa sa isip, asal at damdamin. Bilang karagdagan, naipamalas din ang iba't ibang kalagayan at suliraning panlipunan tulad ng diskriminasyon sa pisikal na kaanyuan, maling paniniwala at gawi ng mga tao sa relihiyon, pagkalulong ng mga kabataan sa ipinagbabawal na gamot, pagsasamantala sa kahinaan ng kababaihan at kawalan ng hustisya.

Keywords: *Hiligaynon, maikling kwentong Hiligaynon, pagsasalin, pagsusuri*

INTRODUKSYON

Ang pagpapatupad ng Senior High School sa bansa ay nagdulot ng pagbabago sa kurikulum; hindi lamang sa hayksul kundi maging sa kolehiyo. Dala ng pagbabagong ito, ipinalabas ng Komisyon sa Lalong Mataas na Edukasyon ang Memorandum Order Bilang 74, serye 2017 (*Policies, Standards and Guidelines for Bachelor of Elementary Education*) na nagsasaad na ang kursong Lit. 101 (Ang Panitikan ng Rehiyon) ay sasaklaw sa pag-aaral ng mga pangunahing akda sa mga rehiyonal na wika. Maaaring orihinal o salin sa Filipino ang mga tekstong susuriin at pagpapahalagang kultural. Gayundin, ang kursong Pagtuturo ng Filipino sa Elementarya II- Panitikan ng Pilipinas ay nakatuon sa paggamit ng iba't ibang anyo ng literatura ng Pilipinas galing sa sarili at iba't ibang rehiyon sa pagtuturo, produksyon at pagtatasa na angkop sa elementarya.

Samantala, ayon kina Arrogante, et al. (2007), ang kasalukuyang oryentasyon ng kabihansang Pilipino

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ay siyensya at teknolohiya at hindi sa panitikang Pilipino. Limitado ang kanilang kaalaman tungkol sa panitikan dahil sa mahirap itong intindihin at unawain. Isa sa mga panrehiyong panitikan na nangangailangang paunlarin ay ang panitikang Hiligaynon dahil sa kasalatan ng pag-aaral, paggamit at pagsasalin ng mga akda nito lalo na sa anyong tuluyan.

Sa puntong ito, masasabing napakahalaga ng bahaging ginagampanan ng pagsasalin ng mga akdang pampanitikan upang maisakatuparan ang hangaring palaganapin ang panitikang Pilipino. Ayon kay Dela Fuente (2014) sa artikulong “Kahalagahan ng Pagsasaling wika”, ang pagsasaling wika ay nakatutulong upang isulong ang ating ekonomiya dahil kaakibat ng pagsasaling wika ang ating wika, teknolohiya, agham, at medisina. Madaling unawain ng mamamayang Pilipino ang mga teksto kung ito ay maisasalin sa wikang Filipino.

Ang pag-aaral na ito ay nauukol sa pagsasalin at pagsusuri ng mga piling maikling kwentong Hiligaynon gamit ang dulog moralistiko at sosyolohikal. Isa itong paglingap sa panitikang rehiyonal bilang hakbang sa pagpapaunlad ng wika at higit sa lahat sa kasalukuyang pagtuturo gamit ang unang wika.

Napapanahon at angkop din ang pag-aaral na ito lalo na sa kasalukuyang pagtuturo ng Mother-Tongue-Based Multilingual Education Program (MTBMLE) sa wikang Hiligaynon at upang matugunan ang matinding pangangailangan sa kagamitang panturo sa mga kursong

Pagtuturo ng Filipino sa Elementarya II- Panitikan ng Pilipinas at Lit. 101 (Ang Panitikan ng Rehiyon).

Layunin din ng pag-aaral na ito na masagot ang sumusunod na katanungan: Ano ang antas ng kaangkupan ng ginawang salin sa mga piling maikling kwentong Hiligaynon batay sa: a) pagpapahalaga sa tuntuning panretorika, b) kawastuhang panggramatika, c) kalinawan, d) katangiang pampanitikan, at d) kaangkupan sa tema, kaisipan, kayarian at damdamin?; taglay ba ng mga piling maikling kwentong Hiligaynon ang bisa sa isip, asal at damdamin?; at ano ang mga ipinahihwatig na kalagayan at suliraning panlipunan sa mga piling maikling kwentong Hiligaynon?

Ang pag-aaral na ito ay isinalig sa dalawang teorya, ang Teorya ng pagsusuri nina Mabanglo at Baltazar at iba pang kritiko sa pagbanggit ni Cabiling (2002) at Teorya ng Pagsasalin ni Newmark (1988) sa pagbanggit ni Gonzales (2011). Ayon Kay Newmark (1988), “ang pagsasaling-wika ay pagbibigay kahulugan ng isang text sa ibang wika sa paraang ninanais ng may-akda”.

Ang pagsasalin ng pag-aaral na ito ay isinailalim sa pansariling pagsubok ng salin. Ang mga mananaliksik ay nagsalin ng mga maikling kwento at, bago ito ipinabasa sa mga magtataya na eksperto, nagkaroon ng sariling pag-eedit. Mga eksperto sa paksa at wika ang napili sa pagtataya ng mga pagsasalin.. Pagkatapos ng gawaing ito, ang inayos ng mga mananaliksik ang ginawang salin batay sa mga puna at suhestiyon ng mga eksperto.

Ayon kina Mabanglo at Baltazar sa pagbanggit ni Cabiling (2002), ang pagsusuri ay isang sining ng pag-aaral na may layuning mabuo ang uring panitikan para sa kapakanan ng mambabasa, ng manunulat at ng sining. Ito ay isang gawain ng pagsulat at pagtaya sa nilalaman ng panitikan ayon sa isinasaad ng mabuting panlasa at ng mga simulaing pansining.

Sa pag-aaral na ito, sinuri ang limang (5) maikling kwentong Hiligaynon gamit ang pamaraan sa pagsusuri ng kwentong bernakular ni Villafuerte (2000).

Layunin ng pananaliksik na matukoy ang kaangkupan ng pagbibigay kahulugan ng mga maikling kwentong Hiligaynon sa wikang Filipino. Sa pananaliksik na ito, ang ginamit na Teorya ng pagsasalin ay ang teorya ni Newmark sa pagbanggit ni Gonzales (2011). Ayon kay Newmark "ang pagsasaling-wika ay pagbibigay kahulugan sa isang teksto sa ibang wika sa paraang ninanais ng may-akda." Madalas na inaakala natin na ang pagsasaling-wika ay isang payak na pagsasabi ng isang bagay sa ibang wika; ang totoo ang pagsasaling-wika ay isang masalimuot at mahirap na gawain.

Sinuri ang mga maikling kwentong Hiligaynon gamit ang teoryang moralistiko at sosyolohikal. Sa teoryang sosyolohikal, sinuri ang kalagayang panlipunang nakapaloob sa mga maikling kwentong

Hiligaynon. Mga bisang pampanitikang tulad ng bisa sa isip, asal at damdamin naman ang sinuri ayon sa teoryang moralistiko.

METODOLOHIYA

Disenyo ng Pag-aaral

Paraang palarawan-pagsusuri (*descriptive-analytical*) ang ginamit sa pag-aaral na ito. Nasasangkot dito ang paglalarawan, pagtatala, pagsusuri at pagpapakahulugan ng kasalukuyang kalagayan, pagkakabuo at proseso ng isang pangyayari. Tinalakay dito ang mga pagkakaugnay ng mga pangyayari, mga kadahilanan kung bakit nagaganap ang mga kaugalian, paniniwala kaugnay ng mga kalagayan, paniniwala ng mga tao, mga bunga ng mga pangyayari at mga kasalukuyang kaganapan (Hontiveros at Ganson, 2005).

Ang paraang ito ay nakapupuna, nakasusuri at nakalalarawan ng mga katotohanan, kagandahan, kapintasan at kabutihan ng akdang sinuri. Pangunahing layunin ng palarawang paraan ang ilarawan ang kalikasan ng isang sitwasyon habang ito’y nagaganap sa panahon ng pag-aaral at masaliksik ang mga sanhi ng partikular na pangyayari (Sevilla, 1997 sa pagbanggit ni Gonzales, 2011).

Sa pag-aaral na ito, ginamit ang Teorya ng Pagsasalin ni Newmark sa pagbanggit ni Gonzales (2011) na nagsasaad na “ang pagsasalin-wika ay pagbibigay kahulugan ng isang text sa ibang wika sa paraang ninanais ng may-akda na may pagsaalang-alang sa kultura, kaugalian, kaayusang panlipunan at iba pa”.

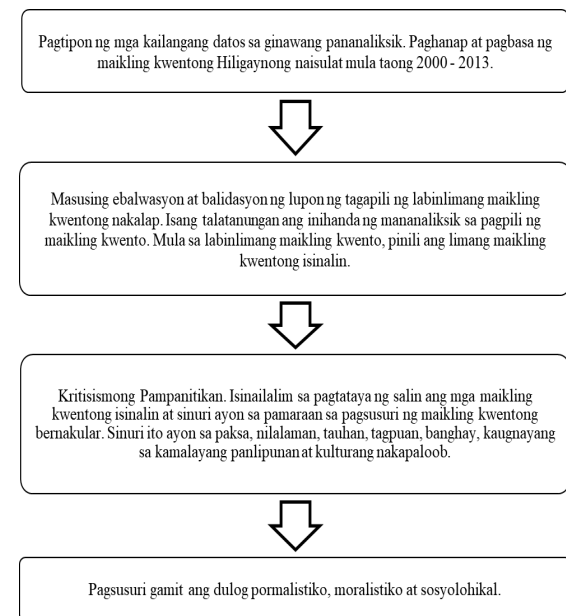
Sa pag-aaral na ito, ginamit ang matapat na metodo ng pagsalin. Ayon kina Batnag at Petras (2009), ang matapat na pagsasalin ay nagsisikap na magbigay ng eksaktong kahulugan ng orihinal habang sinusundan naman ang estrukturang gramatikal ng simulaang lengguwahe. Ang ginawang pagsasalin ay ipinasailalim sa balidasyon ng mga eksperto sa paksa at wika ng maikling kwentong Hiligaynon. Matapos ang balidasyon, sinuri ang mga maikling kwentong Hiligaynon gamit aang dulog moralistiko at sosyolohikal.

Ayon kay Reyes (1992), ang dulog moralistiko ay nagpapalagay na ang akda ay may kapangyarihang maglahad o magpahayag hindi lamang ng literal na katotohanan kundi ng mga panghabambuhay at unibersal na mga kaatotohanan at mga di mga mapapawing pagpapahalaga (values) samantala ang dulog sosyolohikal nagpapalagay na hindi maaaring ihiwalay ang tao sa mga institusyong bahagi ng sistema; ang tao ay isang animal na may dimensyong panlipunan. Mula sa pagkasilang ng tao hanggang sa kanyang kamatayan, bahagi siya ng institusyon na gawa rin naman ng tao- ang pamilya, simbahan, edukasyon, bataas military, politika, agham, kultura at iba pa.

Pamamaraan ng Pag-aaral

Upang matiyak na taglay ng salin ang mga katangian ng isang mahusay na salin, isinagawa ang ebalwasyon ng salin upang mataya kung nailipat nang sapat ang mensahe sa tunguhang lenggwahe (Batnag, 2009).

Ginamit sa pag-aaral na ito ang isang talatanungang hinalaw sa pag-aaral ni Cabiling (2002) upang mataya ng mga tagahatol ang kaangkupan ng



Larawan 2. Mga Hakbang sa Pagsasakatuparan ng Pag-aaral.

pagsasalin. Ito ay binubuo ng mga sumusunod na bahagi: 1) Pagpapahalaga sa Tuntuning Panretorika, 2) Kawastuhang Panggramatika, 3) Kalinawan, 4) Katangiang Pampanitikan at 5)

Kritisismong Pampagsasalin

Isinagawa ang kritisismong pagsasalin sa pamamagitan ng pagsusuri sa gamit na wika, tono, tema, estilo at katangiang kultural. Isinagawa ang masusing paghahambing ng maikling kwentong nakasulat sa Hiligaynon at ang naisalin sa Filipino na may pagbibigay-diin sa lahat ng pagakakaiba ng kahulugan sa isinagawang salin.

Isinailalim ito sa pagsubok ng salin tulad ng pansariling pagsubok kung saan ang mga mananaliksik na siyang tagasalin rin ang gumawa ng salin at nag edit nito bago ikonsulta sa eksperto na siya magtataya sa ginawang salin.

Pang-istadistikang Pagtalakay ng mga Datos

Ang mga natipong datos sa pag-aaral ay tinuos sa pamamagitan ng sumusunod na istadistikang pagtalakay:

Katampatang tuos o Mean. Ito ang ginamit upang matukoy ang kaangkupan ng isinagawang pagsasalin ng limang maikling kwentong Hiligaynon.

Sinuri ng mananaliksik ang kinalabasan ng pagtataya sa pamamagitan ng pagkuha ng katampatang tuos o mean ng mga puntos na inilaan ng mga tagahatol sa bawat pamantayang sinukat.

Upang matukoy ang antas ng kaangkupan ng ginawang salin, ginamit ang sumusunod na pamantayan sa pag-aaral na ito:

| | |
|---------------|---------------------------|
| <i>Iskala</i> | <i>Deskripsyon</i> |
| 4.21 – 5.00 | Napakaangkop |
| 3.41 – 4.20 | Angkop |
| 2.61 – 3.40 | Katamtaman ang Kaangkupan |
| 1.81 – 2.60 | Di-Gaano ang Kaangkupan |
| 1.00 – 1.80 | Di - Angkop |

Ang “Napakaangkop” ay nangangahulugang napakahusay ng ginawang pagsasalin. Ang “Angkop” ay nangangahulugang mahusay ang pagsasalin. Ang “Katamtaman ang Kaangkupan” ay nangangahulugang mahusay nang bahagya ang ginawang pagsasalin. Ang “Di – gaanong Angkop” ay nangangahulugang di-gaanong mahusay ang ginawang pagsasalin kaya kailangang iwasto. Ang “Di – Angkop” ay nangangahulugang hindi mahusay ang pagsasalin kaya kailangang palitan.

RESULTA AT TALAKAY

Antas ng Kaangkupan ng Ginawang Salin sa Kabuuan

Sa pag-aaral na ito, isinagawa ang pagsubok sa salin na kung saan ang mga mananaliksik na siya ring tagasalin ng mga maikling kwento ay nagsagawa ng pansariling pagsubok sa salin bago ito ikinonsulta sa eksperto. Ang mga ekspertong ito ay nagbigay hatol sa ginawang salin. Sila ay nagbigay rin ng komento, suhestiyon at iskor sa ginawang salin batay sa talatanungan ng pagtataya ng salin.

Ang kinalabasan ay nagpakita na sa kabuuan, ang ginawang salin sa Filipino ng limang maikling kwentong Hiligaynon ay napakaangkop. Ito ay pinatunayan ng natamong pinagsamang katampatang – tuos na 4.91.

Ipinakita rin sa pag-aaral na taglay ng salin ang pagpapahalaga sa tuntuning panretorika (4.88) kawastuhang panggramatika (4.85), kalinawan (4.85), katangiang pampanitikan (4.98) at kaangkupan sa tema, kasipan, kayarian at damdamin (5.00). Ito ay nagpakita lamang na napakahusay ng ginawang salin dahil taglay ng mga ito ang katangiang nabanggit. Ibig sabihin na nakita ng mga tagataya ng salin na napakahusay ng ginawang salin ng mga piling maikling kwentong

Hiligaynon kaya napakaangkop ng kinalabasan ng pagtaya sa pangkalahatan.

Samantala may pagkakaugnay ang pag-aaral ni Pagayon (2020), na pinamagatang “Maikling Kwentong Hiligaynon sa Panahon ng Milenyong Pagsasalin at Pagsusuri” sa ginawang pag-aaral na ito sapagkat siya ay nagsagawa ng pagsusuri ng mga maikling kwentong Hiligaynon na gumamit ng talatanungan sa pagtataya ng salin. Napag-alaman na ang ginawang salin sa Filipino ay may katumpakan na 4.67. Ang resulta ay nagpapakita na ang salin sa Filipino ng mga maikling kwentong Hiligaynon ay ay may kaangkupan sa tema, kaisipan, kayarian at damdamin.

Pagsusuri ng mga Maikling Kwentong Hiligaynon

Ayon kay Arrogante at iba pa (2007), ang maikling kuwento ay isang maikling salaysay hinggil sa isang mahalagang pangyayaring kinasasangkutan ng isa o ilang tauhan at may isang kakintalan o impresyon lamang. Isa itong masining na anyo ng panitikan. Bilang isang akdang pampanitikan, nagtataglay ito ng iba’t ibang elemento o sangkap tulad ng tagpuan, tauhan, banghay, pananalita, tema, damdamin, pananaw at simbolo. Ito ay binubuo ng mga bahaging panimula, paunlad na pangyayari, kasukdulan, kakintalan at wakas. May iba’t ibang uri ng maikling kwento, ito ay kwento ng tauhan, tagpuan, banghay, isipan, katutubong kulay, kababalaghan, katatakutan, katatawan at pakikipagsapalaran. Ang pananaliksik na ito ay nakatuon sa limang makabagong maikling kwentong Hiligaynon na sinuri sa dulog moralistiko at sosyolohikal.

Dulog Moralistiko

Sa dulog moralistiko, inilalahad ang iba’t ibang pamantayang sumusukat sa moralidad ng isang tao-ang pamantayan ng tama at mali (Castillo, 2019). Sa moralistikong pananaw, makikita sa mga kwentong sinuri ang maraming pagpapahalagang pangkatauhan at pagpapahalagang moral ng mga Ilonggo. Dito tinalakay rin ang mga bisang pampanitikan tulad ng bias sa isip, asal at damdamin.

Sa kwentong *Donato Bugtot* (Donato Kuba), pinakatema ng maikling kwento ang pagpapahalaga sa kabutihan. Ang kabutihan ng isang tao sa kabila ng pag-abandona, pagtakwil at pag-alipusta sa kanyang pagkatao dahil lamang sa kanyang pisikal na kaanyuan.

Ang kabutihan ay likas sa mga Pilipino/Ilonggo. Ang pagtulong sa kapwa lalong-lalo na sa gitna ng kagipitan at pangangailangan. Katulad na lamang ng pagdating ng bagyong Yolanda na labis na puminsala sa Kanlurang Bisayas. Marami ang nawalan ng tirahan at mahal sa buhay. Sa kabila nito, madaling nakabangon ang lahat dahil sa pagtutulungan. Makikita dito ang angking kabutihan ng mga Ilonggo na kahit sila man ay

nawalan ngunit nagbigay pa rin ng tulong sa kanilang mga kababayan.

Ipinaalala din ng kwento na huwag nating tingnan ang isang tao sa kanyang pisikal na kaanyuan kundi tingnan ang kanyang kalooban.

“Demonyo ang batasan ni Jed. Sia nga ginbugayan sang katahum kag mala-anghel nga hitsura, napun-an sang kalain kag kalaw-ay. Garuk! Makangilil-ad sia; kag makatalagam, tungod makatiliplang. Hitsura n’ya lang ang mabuot, apang ang sulod, dukot.”

(Demonyo ang ugali ni Jed. Siya ang biniyayaan ng

maganda at mala-anghel na hitsura, pero puno ng kapangitan. Bulok!

Nakakadiri siya; delikado, mapagkunwari. Mukha lang siyang mabait, pero ang ugali’y napakapangit.)

Ang pagiging maka-Diyos ay nakita rin sa kwentong ito. Ang mga Ilonggo ay naniniwalang may Diyos na siyang lumikha ng sanlibutan. Lahat ng nangyayari ay naaayon sa Kanyang kagustuhan. Tulad na lamang sa kwentong ito, si Donato ay iniwan ng kanyang ina, inalipusta at binalewala ng kanyang kakambal ngunit may plano ang Diyos para sa kanya. Siya ang Tagapagligtas! Nagligtas ng kanyang pamilya mula sa kumonoy ng kasalanan. Kasalanan ng kanyang ina, ng kanyang ama at ng kanyang kakambal.

“Makatingala ang mga pamaagi sang Dios. Ikaw, ang bato nga gin-etsa-

pwera sang mga manugtukod, ikaw subong ang sadsaran sang kaluwasan. Ikaw

– ang paaman, ikaw subong ang sugpon nga kabuhi sang imo kapid.

Ginhingalanan ka nga Donato, nagakahulugan ‘ginhatag sang Dios,’ apang ikaw subong ang ginatawag nga maghatag.”

(“Nakapagtataka ang pamamaraan ng Diyos. Ikaw, ang batong binalewala ng mga manggagawa, ikaw ngayon ang daungan ng kaligtasan. Ikaw – ang dagdag, ikaw ngayon ang dudugtong sa buhay ng iyong kakambal. Pinangalanan kang Donato, nangangahulugang “ibinigay ng Diyos”, pero ikaw ngayon ang tinawag para magbigay.”)

Nalakipan din ng positibong pagpapahalaga ang kwento gaya ng pagiging maunawain, mapagkumbaba, mapagpatawad at pagmamahal sa pamilya na taglay ng pangunahing tauhan sa akda na dapat tularan ng lahat. Sa akdang ito malayang nailahad ang katotohanang mahalaga ang pagkakaroon ng busilak na kalooban sa kabila ng mga masama at pangit na nangyari sa buhay, pagpapatawad at pagtanggap hindi lamang sa sariling kahinaan at kalakasan kundi ng kapwa tao.

“Palangga sila. Ilabi na gid ang mga nagatamay sa imo.”

“Mahalin mo sila. Lalo na ang umaapi sa iyo.”

Sa kwento namang si Padre Olan kag Ang Dios (Si Padre Olan at Ang Diyos), tema rin ng kwento ang pagiging Maka-Diyos. Malaki ang pananalig ng mga tauhan sa akda na ibibigay ng Diyos ang kanilang ipinagdarasal na ulan.

“Don Beato,” paathag ni Padre Olan, “pamatian sang Dios ang aton pangamuyo bisan diin kita. Indi kinahanglan nga sa simbahan gid kita mangamuyo.”

“Don Beato,” paliwanag ni Padre Olan, “diringgin ng Dios ang ating panalangin kahit saanman tayo. Hindi kailangan na nasa simbahan upang tayo’y Kanyang pakinggan.”

Ipinakita rin sa kwento ang paniniwala sa himala ng mga tauhan at ang kapangyarihan ng panalangin. Ang mga ito’y hinubdan ng tabing sa maikling kwento sa bagay na kaagad na pagdarasal sa Panginoon upang humingi ng tulong sa anumang problemang kinakaharap. Lubos na pananampalataya sa Kanya ang kailangan para matupad ang anumang kahilingan. Ipinakita sa maikling kwento ang kapangyarihan ng mataimtin na panalangin lalo na kung nagkakaisa sa isang hangarin ang bawat isa para matupad ang anumang hinihiling.

Takus nga nangamuyo ang tanan. Mabatyagan, halos makaptan, ang

pagtuo nga nagaluntad sa bug-os nga simbahan. Mapagsik nga nagkanta ang

mga tumuluo sa upod sa mga pamatan-on sang choir. Kag bisan si Don Beato nga

indi relihiyoso, nag-upod sa pag-amba kag pagbantala sang pagtuo.

(Taimtim na nagdasal ang lahat. Mararamdaman, pwedeng hawakan, ang pananampalataya na nangyayari sa buong simbahan. Masiglang umaawit ang mga deboto kasama ang mga batang miyembro ng koro. At kahit si Don Beato na hindi relihiyoso, nakiisa sa pag-awit at pagbigkas ng kredo.)

Binigyang pansin din sa kwento na totoo ang himala at ang nagagawa nito sa isang tao.

“Sa maniwala ka at sa hindi, naniniwala ako sa milagro. Iyong estatwa na lamang ng Mahal na Birhen na nasa harap ng katedral, nakasaksi ako ng kahiwagaan nito.”

Ginsugid nga milagroso nga nagadaku ang estatwa sang Nuestra Señora

de la Candelaria. Gikan kuno sa isa ka tapak sang nasalapuan ini sang mga

mangingisda sa suba sa Iloilo sadtong 1587, nagalab-ot na subong sa masobra

duha kag tunga ka tapak ang kataason sang estatwa. Kag sumugod sa koronahan

ini sang Santo Papa sadtong 1981, makatatlo na kuno ka beses nga ginpadakuan

ang iya bulawan nga korona.

“Sa maniwala ka at sa hindi, naniniwala ako sa milagro. Iyong estatwa na lamang ng Mahal na Birhen na nasa harap ng katedral, nakasaksi ako ng kahiwagaan nito.” (Sinabing mapaghimalang lumalaki ang estatwa ng Nuestra Señora de la Candelaria. Isang talampakan lamang ito nang matagpuan ng mga mangingisda sa ilog ng Iloilo noong 1587, ngayo’y tinatayang nasa mahigit dalawa at kalahating talampakan na ang taas nito. At mula ng koronahan ito ng Santo Papa noong 1981, tatlong beses ng pinalitan ang laki ng gintong korona nito.)

Naglumaw-lumaw gid ang mata ni Padre Olan sang iya nakita nga ginbaton ni Don Beato ang tinanok nga saging nga gintanyag sang isa ka marismo nga tigulang. Ano nga milagro ang gindulot sang pinasahi nga adlaw sang pagpangamuyo agud mag-ulan sa tagipusoon sang mga tawo?

(Mangiyak - ngiyak si Padre Olan ng kanyang makita na tinanggap ni Don Beato ang nilagang saging na ibinigay sa kanya ng isang gusgusing matanda. Anong milagro ang idinulot ng kakaibang araw ng pagdarasal para umulan sa puso ng mga tao?)

Moralistiko rin ang lapit ng maikling kwentong *Ang Kapid (Ang Kambal)* na nagbigay tuon sa pagmamahal at pagmamalasakit sa kapwa. Ipinapaalala nito na kailangan nating bigyan pansin ang ating kapwa lalong-lalo na ang mga nangangailangan. Binigyang-buhay ito sa katauhan ni Rafael del Valle, isang occupational therapist na nagtrabaho kasama ang mga adik at nawalan ng bait. Pagmamahal at pagmamalasakit ang ipinakita niya sa kanyang mga pasyente na unti-unti ring nagpabago ng kanyang konsepto kung bakit iyon ang kanyang napiling trabaho.

Sa Mandaluyong, masami sia nagabatyag sang nagalugdang nga kaluoy

kag nagapanghawid nga pag-ulikid para sa iya mga pasyente.

(Sa Mandaluyong, palagi niyang nararamdaman ang awa at pag-aalala sa kanyang mga pasyente.)

Ipinapaalala rin ng maikling kwento na may plano ang Diyos sa bawat isa sa atin. Lahat ay nangyayari ayon sa Kanyang kagustuhan at naghihintay lamang siya na tayo’y tumawag sa Kanya. Magtiwala sa kapangyarihan ng Maykapal sapagkat nasa Kanya ang ginhawa kung tayo ay nahihirapan, ang lakas kung tayo’y nabibigatan sa mga pagsubok at liwanag kung nag-aalinlangan o nadidiliman sa buhay. Ang Diyos ang tanging gabay natin na nakakaalam kung ano ang karapat-dapat para sa atin.

Apang ang Dios may iban nga buko kag handum para sa iya.

(Pero ang Diyos ay may ibang plano para sa kanya.)

Kag didto sa Pototan, gintun-an niya nga sundon kag tumanon ang giya

sang indi makita nga Dios

(At doon sa Pototan, pinag-aralan niyang sundin at tuparin ang kagustuhan ng Diyos.)

Bilang moralistikong pananalig, ipinaalala naman ng maikling kuwentong *Lirio (Lirio)* ang labis na pagmamahal ng magulang sa anak. Ang responsibilidad ng magulang ay hindi nagtatapos sa pagbibigay buhay lamang sa sanggol. Higit kailanman, pananagutan ng magulang ang siya'y arugain, bigyan ng pangunahing pangangailangan at higit sa lahat pagmamahal. Tunay na kailangan ng anak ang pagmamahal ng magulang lalo na kung ang anak ay may kapansanan.

Tuman ang pagpalangga kay Lirio sang iya ginikanan apang nagdaku sia

nga wala sang mga abyan.

(Sobra ang pagmamahal kay Lirio ng kanyang mga magulang ngunit

lumaki siyang walang kaibigan.)

Apang ayhan, sa ila pagkaapa, mas nahangpan sang mga tigulang ang

nagkalahanabo sa ila pinalangga nga anak. Kag tungod nga luyag nila nga

makahibi si Lirio nga wala sang huya-huya (o kon ano nga ginaulikdan),

ginpunggan na lang nila ang ila pagginhawa tubtub nagtulurong ila mga kalimutaw.

(Ngunit dahil sa kanila ring pagkapipi, mas naintindihan ng mga matatanda ang nangyayari sa kanilang pinakamamahal na anak. At dahil gusto nilang umiyak si Lirio nang hindi nahihya (o may pinoproblema), pinigilan nila ang paghinga hanggang sa tumirik ang kanilang mga mata.)

Ipinakita naman sa kwentong *Candido (Candido)* ang isang wagas na pag-ibig. Isang pag-ibig na hindi matutumbasan ng anumang materyal na bagay. Pagmamahal na handang makipaglaban sa hagupit ng panahon. Isang pag-ibig na kahit ang pagitan ay napakalawak na karagatan ay paninindigan pa rin ang paghihintay sa taong minamahal.

“Nalipat ka, Didong. Apang ako, wala. Padayon ako nga naghulat, padayon nga naglaum.”

(“Nakalimot ka, Didong. Ngunit ako, hindi. Patuloy na naghintay, patuloy na umasa.”)

Ipinakita rin sa kwento ang isa pang uri ng pag-ibig, ang pag-ibig sa bayan, ang pakikipaglaban para sa kalayaan ng ating bansa.

Kag si Andres, Supremo sang Katipunan – ang likum nga hubon nga

nagapakigbato para sa kahilwayan sang mga Pilipino gikan sa mapintas kag malupigon nga mga Katsila.

(At si Andres, Supremo ng Katipunan – ang lihim na samahan na nakikipaglaban para sa kalayaan ng mga Pilipino mula sa malupit at mapang-aping mga Kastila.)

Sa kabuuan, ang limang maikling kwentong sinuri ay nagtataglay ng mga pagpapahalagang gumugulo sa mentalidad at sa kabutihan ng tao kaya maaaring gamitin para sa pagtuturo ng aral at hitik sa damdamin at emosyon ang mga kwento na nakapagtuturo ang mga ito ng mga aral sa mambabasa. Pinupukaw nito ang damdamin ng mga mambabasa sa pagpapahalaga ng mabuti at masama. May mga hatid na kaalaman at kaisipan na nagdudulot pa rin ng bagong kaalaman ang mga kwentong sinuri. Nakatitinag rin ng damdamin ang nilalaman ng akda dahil sa mga tauhang nagbibigay buhay rito. Samakatwid, taglay ng mga kwento ang mga bisang pampanitikan na binanggit ni Rufino Alejandro: ang bisa sa damdamin, bisa sa isip at bisa sa kaasalan.

Bisa sa Damdamin. Sa kwentong *Donato Bugtot (Donato Kuba)*, hindi maiwasan ng mambabasa ang damdamin ng kalungkutan nang ang batang si Donato ay pinagtangkaang patayin dahil sa anyo nito, paghanga sa angking kabutihan ni Donato, pagkainis at pagkagalit sa ugaling taglay ni Jed Belvis na kakambal ni Donato.

Sa kwentong *Si Padre Olan kag Ang Dios (Si Padre Olan at Ang Diyos)*, pagkalungkot ang tanging naramdaman ng mambabasa dahil sa kawalan ng tiwala ni Padre Olan na ibibigay ng Diyos ang kanyang hinihiling at pagkainis kay Don Beato Yngala dahil sa paggamit ng ibang tao para sa kanyang sariling interes at kapakanan. Nakapanindig balahibo naman ang tungkol sa katauhan ng kambal na sina Angelica at Soledad del Cielo at paghanga naman para sa tauhang si Rafael del Valle ang naramdaman ng mambabasa sa kwentong *Ang Kapid (Ang Kambal)* dahil sa pagmamalasakit nito sa kapwa. Ganyan ding damdamin ang namayani sa mambabasa sa kwentong *Lirio at Candido*. Paghanga sa labis na pagmamahal ni Tatay Manuel at Nanay Rosa at dahil sa bigat ng responsibilidad ng pagiging isang magulang lalo na kung ang anak ay may kapansanan. Paghanga rin sa katapangang taglay ni Candido para makamit ang kalayaan at ang wagas na pag-ibig ni Mayang para sa binata.

Bisa sa Kaisipan. Sa kwentong *Donato Bugtot (Donato Kuba)* naipakita na hindi sa pisikal na kaanyuan nakikita ang kagandahan ng isang tao kundi nasa kalooban, na ang anyo ng isang tao ay mapanlinlang. Samantalang sa kwentong *Si Padre Olan kag Ang Dios (Si Padre Olan at Ang Diyos)* ay nagpakitang magkaroon ng malakas na pananalig sa Maykapal at anumang kahilingan ay magkakaroon ng katuparan.

Ipinakita rin sa akda na hindi madaling maging isang alagad ng simbahan, kaakibat nito ang maraming reponsibilidad. Sa kwentong *Ang Kapid (Ang Kambal)* ipinakita na may mga bagay sa mundo na hindi kayang maunawaan at maipaliwanag ng tao. Ipinamalas naman ng kwentong *Lirio* ang gampanin ng isang magulang sa anak lalo na kung ito'y may kapansanan. Ito ay hindi isang madaling gawain, bagkus ito ay isang obligasyon na kung pakaisipin ay mahirap at mabigat na tungkulin ngunit masarap sa pakiramdam lalo't kung maganda ang iyong hinubog na anak.

Sa kwentong *Candido* ay ipinakita ang katapangan at kagitingan ng ating mga bayani noong Rebolusyon 1896. Hindi naging madali ang buhay ng ating mga bayani para matamo natin ang kalayaang ating tinatamasa sa kasalukuyan. Sa kabilang dako, kahit nasa makabagong panahon na tayo nariyan pa rin ang ating paniniwala sa mga kababalaghan at kapangyarihang dala ng mga tinatawag na anting-anting.

Bisa sa Kaasalan. Habang binabasa ng mga mananaliksik ang kwentong *Donato Bugtot (Donato Kuba)* naisip ng mananaliksik kung gaano kabusilak ang puso ng isang nilalang sa kabila ng pang-aalipusta ng iba. Pinagtangkaan man siyang patayin ng sariling ina dahil sa kanyang kaanyuan ngunit kabutihan pa rin ang kanyang isinukli at ipinakita nang ibigay niya sa kanyang kakambal ang kanyang bato. Ibinigay niya ito hindi dahil sa iyon ay kanyang obligasyon bilang kapatid kundi dahil iyon ang nararapat at tamang gawin. Ang kagandahan ng pisikal na anyo ay lilipas at naglalahong ngunit ang kabutihan ay nanatili sa puso at isipan ng bawat taong binigyan mo nito tulad ni Donato.

Samantala sa kwentong *Si Padre Olan* ang *Si Padre Olan at Ang Diyos* nasabing walang imposible kung malakas ang iyong pananalig sa Maykapal. Naisip ng mananaliksik na laging nandiyan ang Poong Maykapal para tugunin ang ating pangangailangan lalo na kung ang hinihiling ay para sa kapakanan ng lahat. Naghihintay lamang Siya na tayo'y kumatok sa Kanyang pintuan at buong puso Niya tayong pagbubuksan.

Gaya rin sa kwentong *Ang Kapid (Ang Kambal)*, may mga bagay na hindi kayang unawain at ipaliwanag kung bakit may mga nangyayari na labag sa ating sariling kagustuhan. May plano ang Diyos sa bawat isa dahil ano pa man ang ating sinapit iyon ay dahil sa Kanyang kagustuhan. Pagmamalasakit sa kapwa ang siyang nagsilbing patunay na tayo rin ay Kanyang pagmamalasakitan.

Habang binabasa naman ang kwentong *Lirio* naisip ng mananaliksik kung paano ang pagiging isang magulang ng isang batang may kapansanan. Kung paanong hinubog ng magulang ang anak at kung gaano na lang ang kanilang pagnanais na mapunan ang kanyang pangangailangan sa kabila ng kakapusan sa

buhay. Ang hirap at sakripisyo ng magulang mabigyan lamang ng magandang buhay at katiwasayan ang anak kahit kapalit man nito ay kamatayan.

Sa kwentong *Candido*, nasabing makapangyarihan ang pag-ibig. Katulad ng sinabi ni Balagtas: Pag-ibig kapag pumasok sa puso ninuman, hahamakin ang lahat masunod ka lamang. Dahil sa pag-ibig sa bayan ay sinuong ng ating mga bayani ang panganib para palayain sa kamay ng malupit at mapang-aping dayuhan ang ating bansa. Kaya naman huwag nating ipagkait ang pag-ibig sa ating kapwa dahil pag-ibig ang ibinuhos ng ating mga magigiting na bayani para tayo'y maging malaya.

Dulog Sosyolohikal

Ayon kina Castillo (2019), sa dulog na sosyolohikal natatalakay ang mga kalagayang sosyal, ang kapamuhayan, ang mga sitwasyong nag-uudyok ng karahasan, nagtutulak sa tao sa ganoon at ganitong buhay, mga pagkakataong nagiging sanhi o bunga kaya ng mga pang-aapi at pag-aapi, pagkaduhagi o kaya'y kadakilaan, kagitingan, kabayanihan ng isang tao o pangkat ng tao. Ang sosyolohikal ay nagbibigay diin sa mga kalagayan at suliraning panlipunang ipinapahiwatig ng akda.

Sa sosyolohikal na pananaw, makikita sa kwentong *Donato Bugtot (Donato Kuba)* ang dalawang mukha ng tao sa lipunan: ang taong nagtataglay ng kagandahan sa pisikal na kaanyuan at mga taong nagtataglay ng kapangitan. Hindi kaila sa lipunang ating ginagalawan na ang maganda ay hinahangaan at ang mga pangit ay binabalewala at minsan ay inaalipusta. Sa trabaho ay palaging kwalipikasyon ang pagkakaroon ng kaaya-ayang personalidad. Nariyan ang mga pelikulang Kampanerang Kuba at The Hunchback of Notre Dame na sumasalamin sa estado ng tao kung pisikal na kaanyuan ang pag-uusapan.

Ganoon pa man, ipinahiwatig ng kwento na sa lipunang ating ginagalawan anuman ang ating pisikal na kaanyuan ay naririyang pa rin ang ating pamilya at kaibigan na nagmamahal, handang tumanggap at tumulong sa panahon ng pangangailangan.

Ipinakita rin sa kwento ang tungkulin o reponsibilidad ng isang tao bilang indibidwal na bahagi ng lipunan. Bilang miyembro ng lipunan bawat tao ay may kani-kaniyang tungkuling ginagampanan para sa kapakinabangan ng bawat isa. Tungkulin ng bawat isa ang magtulungan, suportahan ang isa't isa at maghanap ng paraan para makapag-ambag ng positibong pagbabago. Ito ang ginawa ni Donato ang pagbigay ng kanyang bato sa kanyang kakambal para bigyan ito ng pagkakataong magbago. Anumang maliliit na bagay ang gawin ay nakapagbibigay ng malaking epekto sa iba.

Sa kwentong *Si Padre Olan* ang *Si Padre Olan at Ang Diyos*, gamit ang sosyolohikal na

pananaw, hindi nakaligtas sa mapanuring pagmamasiid ng may-akda ang maling paniniwala at gawi ng mga tao sa relihiyon katulad ni Don Beato, kahit na para sa kapakanan ng lahat ang inilapit ng don sa pari, alam ni Padre Olan na para sa sariling negosyo/kapakanan ang totoong nagtulak sa don na lumapit sa kanya. Inilalarawan nito ang ilang miyembro ng lipunan na nagkukunwari para makahingi ng pabor para sa ikabubuti ng sarili at pagprotekta sa kayamanan.

Maging ang karaniwang nangyayari sa paligid ng simbahan kahit saang panig man ng bansa ay ipinamalas rin ng akda.

Ginhambalan sila ni Padre Olan nga indi paghimuon nga sirkus ang

liturhiya, nga pat-uron nga wala sang may magalibud sang mani kag baye-baye,

o Tru-Orange kag singkamas bisan sa gwa sang simbahan.

(Pinagsabihan silani Padre Olan na huwag gawing perya ang liturhiya, na siguraduhing walang magtitinda ng mani at baye-baye, o Tru-Orange at singkamas kahit sa labas ng simbahan.)

Ang kwentong *Ang Kapid (Ang Kambal)* ay naglahad ng suliraning panlipunan sa kasalukuyan, ang pagkalulong ng mga kabataan sa ipinagbabawal na gamot. Mga kabataang kulang sa pag-aruga, pagmamahal, pagtingin at paggabay ng magulang. Inilalarawan ito sa pagtatrabaho ni Rafael del Valle sa New Life Therapeutic Center na sentro sa pagrehab ng mga adik at durugista.

Kag didto sa New Life Therapeutic Center, samtang nagatrabaho sia sa

tunga sang mga adik, daw landong nga nagtubo ang kaakig kag pangbasol sa

dughan ni Rafael. Nanugunan gid sia sa mga kabataan nga nagguba sang ila

buasdamlag paagi sa droga.

(Sa New Life Therapeutic Center, habang nagtatrabaho siya kasama ang mga adik, umusbong ang galit at paninisi sa puso ni Rafael. Nanghihinayang talaga siya sa mga kabataang nasira angbuhay at kinabukasan dahil sa droga.)

Sinasalamin naman ng kwentong *Lirio* ang imahen ng kababaihan sa lipunan, bilang pasibo, madaling matakot, hindi gumagamit ng isipan, kayan-kayanan ng kalalalahanian at sentimental. Taglay ang ganitong katangian ng pangunahing tauhan sa kwento.

Padayon nga pagpahubog kag pagpanakit sa asawa sang sutil nga si Itik.

(Patuloy ang paglalasing at pananakit ni Itik sa kanyang asawa.)

Apa niya nga ginbaton ang tanan nga kastigo tungod ini sia makapaathag

kon ngaa ginaduaw sia ni Noli nga may dala nga tatlo ka puti nga liryo.

(Tahimik niyang tinanggap ang lahat ng pananakit dahil hindi siya makapagpaliwanag kung bakit dinadalaw siya ni Noli na may tatlong mapuputing bulaklak (liryo).)

Ipinahiwatig rin ng maikling kwento ang ugaling malihim ng mga Ilonggo. Mga paniniwala't hangga't makakayang dalhin ang isang bagay o suliranin ay pilit kakayanan mag-isa. Ang pagngiti sa gitna ng kalungkutan ngunit tumatangis ang pusong nagdurusa. Ilan lamang ito sa mga kaugaliang hindi kayang burahin sa kamalayang Ilonggo.

Wala gid niya ginapabati sa iya mga ginikanan ang mga ugayong sang

kasakit nga nagkawas sa iya apa nga baba.

(Hindi niya pinaparinig sa mga magulang ang sakit na nararamdaman na umaalpas sa piping bibig.)

Malinaw namang inilalarawan sa maikling kwentong *Candido (Candido)* ang naging kalagayan ng mga Pilipinong nakipaglaban para sa kalayaan sa mga malupit, mapang-api at mapang-abusong mga Kastila. Naging bahagi ng ating kasaysayan ang mga pangyayari sa panahon ng pananakop ng mga Kastila dito sa ating bansa. Tunay na inilalarawan sa maikling kwento ang panahong iyon kung saan ang diwa at damdaming Pilipino gayundin ang buhay at katotohanan sa lipunang pinamumugaran ng kawalan ng pag-asa, takot, sindak at panganib.

Nabatian ko na ang mga tikang sang mga guardia civil nga nagapadulong

sa amon nahamtangan. Ginapanan-aw ko na ang ila pagahimuon...

(Naririnig kona ang mga yabag ng mga guardia civil patungo sa aming kinalalagyan. Nakikinita ko na ang kanilang gagawin...)

Wala gid ako nagsala. Ginpaarakan nila kami sang luthang. Nagsilinamo

ang mga linupok kag ang mga tiyabaw kag singgit sang akon mga kaupod. Kag

subong, agud mapat-ud nga patay na sila, isa-isa nga ginatuslok sang bayoneta

sang mga guardia civil ang kilid sang akon mga abyan kag kauturan.

(Hindi ako nagkamali. Pinaulanan nila kami ng bala. Naghalo ang putok at taghoy at mga sigaw ng aking kasama. At ngayon, para masiguradong patay na sila, isa-isang tinusok ng bayoneta ng mga guardia civil ang tagiliran ng aking mga kaibigan at kapatid.)

Inilalarawan rin sa akda ang kawalan ng hustisya noong unang panahon. Isang sakit na mahirap masugpo sa ating lipunan. Nais pagtagpuin sa kwento ang noon at kasalukuyang hinaharap ng bansa kung hustisya ang pag-uusapan. Ang mga ordinaryong tao sa lipunan na ginawan ng masama ang siya pang may kasalanan dahil lamang ang kanilang kinalaban ay makapangyarihan.

“Isa ka bes, may isa ka pangayaw, manggaranon nga Katsila. Nakita niya

*si Nanay kag nahulog ang iya buot sa akon
iloy. Ginbalibaran sia ni Nanay apang
ginpwera niya... ginlugos niya... ang akon iloy!
Nanugid kami sa mga awtoridad
apang si Nanay pa ang ginbilanggo.*

***(“Isang araw, may isang dayuhan, mayamang
Kastila. Nakita niya si Inay at nahulog ang kanyang
loob dito. Tinanggihan siya ni Inay pero pinilit niya
ito... pinagsamantalahan niya... ang aking ina!
Nagsumbong kami sa mga pulis pero si Inay pa ang
ikinulong.”)***

Malinaw ring inilahad sa kwento na bahagi na ng kulturang Pilipino ang paniniwala sa mga anting-anting o agimat. Patuloy pa rin tayong naniniwala sa mga kababalaghang nangyayari sa ating paligid kahit na tayo’y nasa makabagong panahon na.

*Padayon ako nga nagatuo kag nagasalig sa akon
anting-anting tungod*

*sumugod sang nadakop ako tubtub subong,
ginaamligan ako sang akon anting-
anting.*

***(Patuloy akong sumasampalataya at
nagtitiwala sa aking anting-
anting dahil mula noong ako’y nadakip
hanggang ngayon, pinoprotektahan
ako ng aking anting-anting.)***

Sa mga maikling kwentong sinuri ay ipinamalas ang iba’t ibang kalagayan at suliraning panlipunan tulad ng diskriminasyon sa pisikal na kaanyuan, maling paniniwala at gawi ng mga tao sa relihiyon, pagkalulong ng mga kabataan sa ipinagbabawal na gamot, pagsasamantala sa kahinaan ng kababaihan at kawalan ng hustisya. Inilahad ito sa pamamagitan ng paglarawan ng realidad ng lipunang ginagalawan ng mga Ilonggo at ng bawat Pilipino.

Si Gorumba, (2019), ay nagkaroon ng pag-aaral hinggil sa “Pagsasalin at Pagsusuri ng Akdang Panitikan ni Jesus Sanchez” na gumamit ng apat na maikling kwento ni Jesus Sanchez ng Palompon, Leyte. Ang resulta ng pag-aaral na ito ay nagsasaad na sa pamamagitan ng mga isinaling mga maikling kwento ay mas mabibigyang puwang ang mga lokal na manunulat at maiugnay ang mga nilalaman ng mga kwento sa aktwal na nakikita at nararanasan ng mga estudyante gaya ng kultura ng lugar. Ang pag-aaral ng pagsasalin at pagsusuri ay napapalaganap din ang mga akdang panitikang lokal.

Sa paggamit naman ng teoryang sosyolohikal ang naging resulta ng pag-aaral ay napag-alaman na isinasaad sa maikling kwento ang kultura ng lipunan tulad ng pagkalinga, halimbawa, ang pansamantalang pagpapatira sa bahay ng Kapitan ng mga gurong itinalaga sa malayo o bulubunduking lugar hanggang sa makabisado niya ang lugar at mamamayan. Ang

pagtanggap naman sa mga bisitang tagasuri sa mga paaralan ay talaga.

KONKLUSYON

Isang kritisimong pampagsasalin ang isinagawa sa pag-aaral na ito na isinailalim sa pagsubok ng salin. Ginawa ng mga mananaliksik na siyang tagasalin rin ang pansariling pagsubok bago ang pagkonsulta sa eksperto. Sa pagkonsulta sa eksperto, gumamit ng talatanungan sa pagtataya ng ginawang salin.

Taglay ng isina-Filipinong mga maikling kwento ang pagpapahalaga sa tuntuning panretorika, kawastuhang panggramatika, kalinawan, katangiang pampanitikan at kaangkupan sa tema, kaisipan, kayarian at damdamin ay nagpapalinaw sa akda kaya madali itong maunawaan.

Ang naisaling maikling kwentong Hiligaynon ay nagtataglay ng mga batayang sangkap ng nilalaman, kaanyuan at paraan ng pagkakasulat, tema o paksa, sensibilidad ng mga tauhan, pag-ugnayan ng mga salita, istruktura ng wika, metapora at iba pang sangkap ng tunay at ganap na maikling kwento. Pagpapatunay lamang ito sa teorya ni Newmark (1988) sa pagbanggit ni Cabiling (2002), na nangangahulugan na ang ginawang pagsasalin sa akda ay nabigyan kahulugan sa isang teksto sa ibang wika sa paraang ninanais ng tagasalin.

Ang mga maikling kwento ay naglalarawan ng kabutihan, pagmamalasakit sa kapwa, pag-ibig ng magulang, pag-ibig sa bayan at sa kapwa, wagas na pag-ibig at pagpapahalaga sa kalayaan. Naglalahad din ito ng pagiging pantay ng tao sa paningin ng Dakilang Lumikha. May hatid na aral ang maikling kwento upang pukawin at paunlarin ang isipan ng mga mambabasa, limiin o pakatimbangan ang mabuti at masama at kumilos ng tama na naayon sa batas ng Diyos at batas ng tao. Taglay ng mga maikling kwento ang bisa sa isip, asal at damdamin.

Sa pag-aaral ni Sombria (2019), na “Pagpapahalagang Aral Nakapaloob sa mga Piling Maikling Kwento ni Genoveva Edroza-Matute” ay may layuning magbigay ng mahahalagang impormasyon at moral tungkol sa mahahalagang aral na nakapaloob sa mga piling kwento ni Genoveva Matute sa pamamagitan ng pagsusuri sa mga balyung masasalamatin na maaaring moral, sosyal o ispirital. Tinukoy rin niya ang mga isyung panlipunan na litaw na litaw sa mga kwento at inilahad ang implikasyon nito sa pag-aaral ng panitikan at natuklasan na punung-puno ng pagpapahalagang moral ang mga akdang pampanitikan na nakapagbibigay ng impormasyon sa mga mambabasa upang mapalawak ang kanilang kaalaman, naipakita ng may-akda sa kwento ang mga aral at mga balyung nais iparating sa kanyang mga mababasa, nangingibabaw ang mga

pagpapahalagang moral na mabuti sa kwento dahil sa sumusunod ang tao sa pamantayan ng kagandahang asal at nagbubunga ng masama ang mga ugaling di mabuti.

Ipinakita ang mga suliranin at kalagayang panlipunan sa akda tulad ng: diskriminasyon sa pisikal na kaanyuan, maling paniniwala at gawi sa relihiyon, kawalan ng hustisya, pang-aapi sa kababaihan, tungkulin ng isang kasapi ng lipunan, at kahirapan. Tumatalakay ito sa kalagayan at suliraning panlipunan ng bansa at pang-araw-araw na pamumuhay ng mga Ilonggo/Pilipino.

Sa kabilang dako, ang resulta ng pag-aaral na ito ay naging tugon sa pagpapayabong ng sariling panitikan. Ayon kay San Juan (2020), dapat pagsiglahin ang pagsasalin sa mga progresibong panitikan mula sa ibang bayan sapagkat ang mga akdang ito'y makatutulong din sa pagpapahusay ng estilo at porma ng panitikang Filipino.

Isa itong tugon sa pagpapalawak ng saklaw ng pagsasalin ng panitikan sa bernakular tungo sa wikang pambansa. Ang Kawanihan sa Pagsasalin ng Komisyon ng Wikang Filipino at ang pakikipag-uganayan nito sa mga nangungunang unibersidad sa buong bansa tungo sa mabilis at mas mahusay na lansakang pagsasalin ay magkakaroon ng sapat na kagamitang panturo sa isang ganap na Filipinasadong sistemang pang-edukasyon na makhuhubog at makalilalang ng mga mag-aaral na maging mapanuri at malikhaing mag-isip.

Ito ay isa ring tulong upang maisakatuparan ang kahalagahan ng pagsasalin na inilabod sa unang kabanata ng "Patnubay sa Pagsasalin" na inilabas ng Pambansang Komisyon sa Kultura at Sining na ang tungkulin ng pagsasalin sa paglilipat ng kultura't kaalaman sa buong mundo. Sa pag-aaral na ito, naililipat nito ang kultura at kaalamang Ilonggo sa buong bansa at iba pang sa makakaunawa ng wikanag Filipino. Sa maikling sabi, napapalawak nito saklaw ng tagatangkilik ng akdang Hiligaynon.

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AUTHORS' CONTRIBUTIONS

N.L.R.: Konseptwalisasyon, pamamaraan, validation, pormal na pagsusuri, pagsulat ng orihinal na draft; D.A.B.R.: Konseptwalisasyon, pamamaraan, validation, pormal na pagsusuri, pagsulat ng orihinal na

draft; J.T.L.: Istatistikal na pagsusuri, pormal na pagsusuri, pagsulat ng orihinal na draft.

CONFLICT OF INTEREST

Ang mga mananaliksik ay nagdedeklara na walang komplekto ng interes kaugnay sa pananaliksik na ito.

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Cultural Significance of Mt. Mayon Natural Park: Albay's Icon of Natural Heritage

Edgardo L. Besmonte

ABSTRACT

Mt. Mayon Natural Park (MMNP), commonly known as Mayon Volcano, is one of the most celebrated natural heritages in the Province of Albay. It is a classic stratovolcano that rises 2,462 m (8, 189 ft) above sea level. This paper discussed the inherent cultural significance of MMNP by utilizing the cultural mapping approach of the National Commission for Culture and the Arts (NCCA) to map significant natural resources. The informants' articulation of the significant values of the volcano is a manifestation that the site is a significant natural property in the city. However, a lot of significant data are missing to fully provide holistic and comprehensive articulation of the significance of the volcano. From this context, this paper recommends the inclusion of MMNP in the targets for the next cultural mapping exercise of Tabaco City. Moreover, an update on the diversity and distribution assessment of flora and fauna may be considered to provide the Local Government Unit of Tabaco City with the current status of biological status of the volcano as baseline data for future efforts in the conservation and protection of the site.

Keywords: *Cultural mapping, cultural significance, Mt. Mayon Natural Park, natural heritage*

INTRODUCTION

Natural heritage is geological and physiological formations that constitute a habitat of endangered species of flora and fauna (World Heritage Center, 2005). Its physical and biological characteristics demonstrate the importance of science, conservation, and natural beauty (Australian Heritage Commission, 2002). National Park, game refuges, wildlife, bird and fish sanctuary, nature and mangrove reserves, watersheds, wilderness areas, protected areas, and natural and historical landmarks are considered natural properties of cultural significance under the National Integrated Protected Area System (RA 10066) for possessing outstanding values of national scientific significance.

One of the most celebrated natural heritages in the Province of Albay is Mt Mayon Natural Park or Mayon Volcano. It is a classic stratovolcano that rises to 2,462 m above sea level. It is an active volcano that is recognized for its diverse natural resources (Buot, 2009). Mayon Volcano was declared a game refuge

under Presidential Proclamation No. 3915, a forest reserve under Presidential Proclamation No. 341, a National Park under Presidential Proclamation No. 292, and a Natural Park by virtue of NIPAS Act of 1992. On June 22, 2018, Mayon Natural Park was renamed Mt. Mayon Natural Park under Republic Act No. 11038.

Conversely, a cultural property is considered significant if it contributes to an understanding of the cultural or natural history, exhibits rare aspects of the cultural or natural environments and demonstrates aesthetic characteristics of the local area. The cultural significance which comprises aesthetic, historical, social, and scientific value, helps in determining the value of places that helps in understanding the past, enriching the present which will be of value to future generations (ICOMOS, 1999). Further, the assessment and statement of the cultural significance of a heritage item clarifies why the item is essential should be part of heritage management. The cultural significance is attributed to the cultural property by the community members because the cultural significance of a cultural property makes a heritage item profoundly valuable (Borrinaga, et al., 2019).

On the other hand, the historical significance refers to the contribution of the cultural property to an understanding of a historical event. Moreover, social significance is categorized into social, socioeconomic, socio-political, and spiritual. Particularly, a cultural

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property is socially significant if it contributes to the economic life of the community, plays a significant role in binding the people, and demonstrates importance or relevance to a cultural value to the community. A cultural property is likely economically significant if it contributes to the economic life of the community. Furthermore, scientific significance refers to the ability of the cultural property to reveal new scientific knowledge or truth.

Tabaco City, Philippines is one of that cities in the province of Albay that share jurisdiction of Mt. Mayon Natural Park. This paper emphasized the cultural significance of Mt. Mayon Natural Park because understanding of the site's cultural significance will lead to a better understanding of its value.

METHODOLOGY

This paper is part of a cultural mapping project in Tabaco City, Philippines. As defined, cultural mapping is an approach in cultural research that document, record and utilize cultural resources of the communities” (Cook and Taylor, 2013). This paper employed the National Commission for Culture and the Arts’ cultural mapping framework in mapping of Mt. Mayon Natural Park. The framework includes scoping and negotiation, social preparation, local cultural mapping team training, collection/gathering of data, data validation and finalized profile (Borrinaga et al., 2019).

Study Site

The study site is Mt. Mayon Natural Park (MMNP) or Mayon Volcano. It covers the cities of Legazpi, Ligao City, and Tabaco City, and the municipalities of Malilipot, Bacacay, Sto. Domingo, Daraga, Camalig, and Guinobatan.

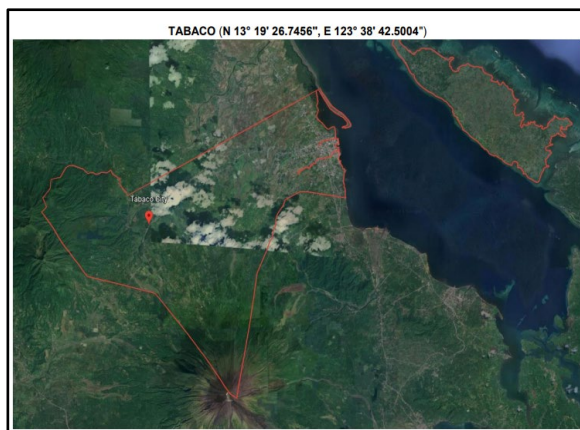


Figure 1. Map of Tabaco City

Key Informants

This paper gathered information from three officials and 10 residents of the Tabaco City. The informants were chosen based on the following criteria; (a) must be native resident of the place, (b) 30 years and above, (c) exhibit knowledge about the cultural heritage and (d) must have experienced the local culture (Luna & Roxas, 2016).

Data Gathering

After the scoping and negotiation, social preparation, and training of the local cultural mapping team, the trained cultural mappers were sent to the field to gather data. The mappers collected data in the community guided by Filipino Psychology (Pua & Marcelino, 2000). Individual interviews with the informants were done using form 1-A of the NCCA on mapping significant natural resources in the category of natural geological and physical/land formations. During the interview process, the questions from the research

Form 1-A (January 2008)

NATIONAL COMMISSION FOR CULTURE AND THE ARTS
 SUBCOMMISSION ON CULTURAL HERITAGE
 CULTURAL MAPPING PROGRAM

Mapping of Significant Natural Resources
 Category: Natural Geological and Physiographical / Land Formations
 NAME OF NATURAL HERITAGE: _____

PHOTO: _____

I. BACKGROUND INFORMATION

| | | | | |
|-----------------|-----------------------------------|-----------------------------------|---|----------------------------------|
| A. SUB-CATEGORY | <input type="checkbox"/> MOUNTAIN | <input type="checkbox"/> VOLCANO | <input type="checkbox"/> HILL | <input type="checkbox"/> SANDBAR |
| | <input type="checkbox"/> VALLEY | <input type="checkbox"/> BASIN | <input type="checkbox"/> MARSHLAND | <input type="checkbox"/> ROCK |
| | <input type="checkbox"/> SLOPE | <input type="checkbox"/> MUD | <input type="checkbox"/> ROCK/STONE FORMATION | <input type="checkbox"/> PLAINS |
| | <input type="checkbox"/> SHORE | <input type="checkbox"/> MUD | <input type="checkbox"/> BIRKHOLE | <input type="checkbox"/> CAVE |
| | <input type="checkbox"/> PLATEAU | <input type="checkbox"/> SANDHOLE | <input type="checkbox"/> CAVE | <input type="checkbox"/> OTHER |

B. LOCATION: _____

C. AREA (in hectares): _____

D. OWNERSHIP/ JURISDICTION: _____

II. DESCRIPTION
 (Describe the physical features of the land formation) _____

III. STORIES ASSOCIATED WITH THE LAND FORMATION _____

IV. SIGNIFICANCE
 Indicate type of significance, e.g. historical, aesthetic, scientific, social, socioeconomic, socio-political, spiritual and their explain: _____

V. CONSERVATION
 A. STATUS OF PROTECTION: _____
 B. CONSTRAINTS/THREATS/ ISSUES: _____
 C. CONSERVATION MEASURES: (Describe the conservation measures taken at the level of the community, provincial and/or national) _____

VI. REFERENCES _____

KEY INFORMANT/S: _____
 REFERENCE/S: _____
 NAME OF MAPPER/S: _____

Significant Natural Resources (Land Formations)
 City/Municipality of _____
 Province of _____
 Region _____

Figure 2. Form 1-A of the NCCA on mapping of significant natural resources

instrument were translated into the vernacular for better understanding among the informants. The interviews were documented through paper and pen.

Ethical Considerations

Ethical guidelines were observed during fieldwork. Inform consent was sought from the participants of the mapping exercise. At the onset of the interview, the mappers discussed the purpose of the

activity. Also, permission was asked from the participants to take photographs or video recordings during the process of the interview.

During the interview, respect for the key informants, local values, and language of informants was observed. The mappers maintained proper behavior all the time. Likewise, the cultural mappers adhered to all health protocols mandated by the IATF and Local Government Unit of Tabaco City to ensure the safety of the participants since the fieldwork was done at the height of Covid 19 pandemic.

Data Analysis Techniques

The results of the interviews were transcribed and qualitatively analyzed through manual coding proposed by Saldana (2009). The researcher carefully read and analyzed the transcripts of the interviews applying codes to the themes that appeared in the responses of the informants. The codes were then organized according to the ideas or concepts that developed from them.

Moreover, the gathered data were presented during the community validation facilitated by the NCCA. Five experts and 21 stakeholders who confirmed the validity of the mapped entries participated in the community validation.

RESULTS AND DISCUSSION

Cultural Significance of Mt. Mayon Natural Park

MMNP reveals an important historical past in Tabaco City. It was believed that the 1814 volcanic eruption which is considered to be one of the most violent eruptions of the volcano, devastated almost all the building structures in Tabaco City including the first stone church in Barangay Cormidal, Tabaco City. A bigger stone church was constructed using volcanic stones and erected next to the town watch tower.

The eruptions of Mayon Volcano throughout the centuries have developed a culture of resiliency among the residents of Tabaco City. The results of the study have corroborated the findings of Chua (2019) stating that the Mayon volcano's destructive eruptions have contributed to the enrichment of heritage values and become an important symbol of resiliency. The communities near the site have adapted to the drastic change brought about by the adverse effects of the eruptions. The residents continue living after every destructive eruption manifesting their resiliency.

Likewise, MMNP is socially significant. The residents, especially those living at the foot of Mt. Mayon, have developed indigenous beliefs or knowledge about impending threats of the eruption of the volcano. The residents believed that a hermit protected Mayon Volcano Natural Park from

devastating human activities. The residents also believe that if wild animals migrate to the residential areas, when the soil becomes dry, recurrent earthquakes, sharpening of the appearance of the crater of Mayon Volcano, and an alleged apparition of a hermit indicate a looming eruption of the Mayon Volcano. If the residents observe these signs, they start to secure their animals and other properties.

Similarly, local myths attributed to Mayon Volcano also flourished in Tabaco City. A folk narrative said that the early inhabitants of Tabaco City were the "Pagcamootans" who thrived in "Barangay Pagcamoot". These people considered Mayon Volcano sacred because they believed that their ancestors were born out of one of the major eruptions of Mayon Volcano.

MMNP is also spiritually significant; the volcano is believed to be the dwelling place of the early gods of Bicolanos, "Mayong" and "Gugurang". Currently, the foot of Mt Mayon Natural Park in Tabaco City has become a pilgrimage site for "Alay Lakad sa Mayon" or "Penitensya sa Mayon" held every Holy Week.

Further, the eruption of the Mayon volcano paved the way for the creation of various religious traditions and prayers such as "Perdon", "Kristiyanong Turog" and "Oratio Imperata". Mt Mayon Natural Park is a testament to how merciful and loving God is. He will always protect His people against the devastation of any natural calamities especially the devastating eruption of Mayon Volcano.

On the other hand, the residents of Tabaco City also articulated that MMNP is economically significant. The fertile soil in the volcano makes the land an ideal site for agriculture thus, becoming a source of livelihood for the community and economic development.

Conversely, the cone shape of Mt Mayon Natural Park makes the volcano aesthetically significant. The whole Province of Albay considers Mt. Mayon Natural Park as a perfect coned volcano that gives almost all of Albay Province the most beautiful sight and picturesque view of the Volcano.

A popular folk legend associated with its aesthetic qualities is famous throughout the whole province. It is said that the volcano mysteriously appeared where "Daragang Magayon", a beautiful maiden, was buried. The legend also explained that the volcano was named after "Daragang Magayon" translated as beautiful maiden; thus, it is called "Mayon". The perfect cone shaped Mayon Volcano is associated with the physical beauty of the legendary character, "Daragang Magayon".

Moreover, there are numerous artworks, and photographs showcasing the volcano's impeccable beauty that reflect the community's appreciation for its aesthetic qualities and have inspired local artists, which developed the culture and arts in the community.

In addition to the volcano's aesthetic qualities, it also possesses biological characteristics. It is home to 83 species of trees, including the critically endangered dipterocarp species, the Gisók-gisók (*Hopea philippinensis*). There are 104 species of land vertebrates including 57 species of birds, 10 species of amphibians, 24 species of reptiles, and 13 species of mammals; and 34 herpetofaunal species including the Bicol false gecko (*Pseudogekko sumiklab*), a new discovered Philippine endemic species in the site. It also has a total of 71 woody species that belong 49 genera and 33 families, along with an altitudinal range of 500 - 2200 meters above sea level on the northwestern side of Mt. Mayon, Bicol Peninsula, Albay, Philippines (Buot, 2009).

For the water supply, the average annual rainfall in Mayon is about 2,716 millimeters more than the estimated average rainfall of the Philippines which falls at 2,400mm (DENR, 2000). Thus, the protected area is abundant with water resources found in the surface or groundwater that can be used for domestic consumption irrigation, and other purposes. More recently, MMNP is on the tentative list of UNESCO World Heritage Sites for its outstanding universal value as a natural property of cultural significance and as Biosphere Reserve of the Province of Albay (Chua, 2019). Likewise, Mt. Mayon Natural Park contributed to the evolving science of volcanoes, contributing to a better scientific understanding of the volcanoes worldwide (Jimenez, 2006).

CONCLUSIONS AND RECOMMENDATIONS

The residents of Tabaco City recognized the cultural significance of Mt. Mayon Natural Park (MMNP). The informants have articulated the volcano's significant values which is a manifestation that the site is a significant natural property in the city. The inherent cultural significance of the volcano makes the community value and protect the site since it has become a natural symbol of their heritage and culture. However, a lot of significant data are missing to fully provide holistic and comprehensive articulation of the significance of the volcano. From this context, this paper recommends including Mt. Mayon Natural Park in the targets for the next cultural mapping exercise of Tabaco City. Moreover, for a better understanding of the scientific significance of MMNP, it is therefore recommended that further scientific research such as diversity and distribution assessment of flora and fauna must be done to provide an updated status of biological resources of the site which will serve as baseline statistics for future efforts in the conservation and protection of the site.

Additionally, the series of volcanic eruptions which is an important part of the heritage of Tabaco City

and other parts of the Albay Province though it can no longer be captured, can be further studied through old photographs, stories, and damage reports among others to provide a comprehensive data regarding the historical past of the city.

Further, a cultural mapping activity that will document the heritage values of the volcano along with other cities and municipalities covered by the volcano must be done so that the greater public will raise their awareness of the heritage values of the volcano which will lead to improved protection, conservation, and promotional initiatives.

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AUTHOR'S CONTRIBUTIONS

The author confirms sole responsibility for the whole manuscript and study.

CONFLICT OF INTEREST

This investigation holds no conflict of interest across and between the samples of the investigation, institution where it was conducted, and other affiliations.

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Enhanced Prepare2Excel: Its Effect on the Board Licensure Examination for Professional Teachers Reviewees

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ABSTRACT

This study tested the effectiveness of the college-developed online review facility, Prepare2Excel. Primarily, it purported to provide enhanced learning-tool both for Board Licensure Examination for Professional Teachers (BLEPT) reviewers and facilitators; customize review programs based on the current reviewers' needs; extend the reach of the review facilities beyond RSU premises; and achieve 100% rate of BLEPT passers. Reviewers' scores in diagnostic, pre-board, and actual BLEPT test results were compared. The intervention was done through a series of sessions, and participants took the tests at the scheduled time as set by the college. Paired sample t-test was employed to test for significant differences between the three conditions. Interview was also conducted to supplement the quantitative data gathered. Based on the findings, the intervention was found to be helpful for the participants' performance in BLEPT. With that, it is highly recommended for the BLEPT takers for the succeeding years. Most importantly, since this is technology-based, it is expected that data from each phase of the program can be secured well and organized for future reference, hence an ideal way for an effective data management system, which includes database management systems, data warehouses, data integration tools, analytics, and more.

Keywords: *enhanced review program, accreditation*

INTRODUCTION

Romblon State University is the only public higher education institution in the province of Romblon (Republic Act No. 9721). It offers a total of 48 undergraduate academic programs in all campuses including the Teacher Education Program. In its aspiration to continuously achieve quality and excellent Teacher Education programs, the College of Education deemed to engage in needs-based innovations and intervention programs. This is also in line with its desire to satisfy one of the criteria to qualify for Center of Excellence (COE) or Center of Development (COD) status. In this regard COEs and CODs are expected to provide excellent human resources and facilities to achieve its academic objectives, in this case, licensure examination (CHED, 2006). This is the reason why

Prepare2excel (P2E) was developed by the college. It is a test-based-learning online application, created by the College of Education which is dedicated to enhance the skills and knowledge of prospective examinees aspiring to score well in board or licensure exams. It is a facility that helps reviewees assess themselves in terms of their weakness and strength on different aspects of exam topics, exam preparedness and readiness to manage the exam through the aide of unlimited online simulated examinations. Some studies support the importance of review program to the examinees' performance in the actual exam. The findings of Delos Angeles (2019) suggest that reviewees' performance in the review increases the probability of passing the licensure exam. This is also corroborated by Visco (2015) who stated that attendance in review classes is a good predictor of LET performance. The repeated test-taking simulations help unravel specific areas where a particular reviewee needs to prepare and prioritize; and learn additional test-taking and time management skills needed in the actual exam. Thus, it does not only provide individual assessment of one's level of preparation and readiness but equally enrich a reviewees' confidence to tackle

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exam by knowing specifically the topics or subjects needed to cover, the areas where more importance must be given priority and getting accustomed as to how a reviewee handles the exam.

On May-September 2018, the first implementation of the review program was implemented. There were 118 reviewees who subscribed to the program. The findings of the implementation showed different emergent themes from the responses to the question on how the facility can be improved to help future reviewees. Among the major themes is the content of the facility. The respondents forwarded some inputs such as complete explanations with concrete examples, including videos, pictures, illustrations, and tutorials allowing trial-and-error in solving numerical problems and including of extensive and intensive notes and lectures. Moreover, connectivity is another emergent theme from the responses. Connectivity includes actual and stable connection with the internet, while it also means connection with fellow reviewees and teacher-reviewers.

Thus, the findings and recommendation from the first implementation were incorporated in this study. This paper determined the effectiveness of the add-on facility of the enhanced review program.

Specifically, the enhanced review program sought to answer the following:

1. What are the respondents' mean scores in the following:
 - a. diagnostic examination;
 - b. preboard examination; and
 - c. actual BLEPT result
2. Is there a significant difference between the reviewees' results in the following:
 - a. diagnostic examination results with preboard results;
 - b. diagnostic examination results with BLEPT results; and
 - c. pre-board examination results with actual BLEPT results?
3. What are the respondents' perceptions about P2E program?

METHODOLOGY

This study utilized the quantitative research design. One group pretest-posttest method was employed in the study. This research method is appropriate since it intended to determine the effect of a treatment or intervention on a given sample. It is characterized by two features. The first feature is the use of a single group of participants (i.e., P2Excel Reviewees). In this manner, all participants were considered as part of a single condition—all participants were given the same treatments and assessments. The second feature is a linear ordering that requires the

assessment of a dependent variable before and after a treatment is implemented (i.e., a diagnostic-preboard). Within this process, the effect of a treatment was determined by calculating the difference between the first assessment. After the post test, an interview (structured/semi-structured) was conducted.

Population and Samples

The main respondents of the survey were the reviewees of Prepare2excel at the main campus of Romblon State University located in Liwanag, Odiongan, Romblon. It was conducted on May 2019 - October 2019. Convenience sampling was employed to gather the respondents of the study. Of the 120 reviewees, 50 samples were obtained since only 50 reviewees were able to provide the needed data especially the BLEPT scores.

Instrumentation

The P2Excel program utilized a 150-item, CED-faculty constructed tests under General Education subjects, Professional Education subjects, and Major subjects. These test items were uploaded by the service providers in the P2excel on-line review platform.

Data Gathering Procedure

Before the diagnostic /preboard examination was conducted, the reviewees were informed of the schedule on the examinations for General Education, Professional Education, and Specialization. Since these examinations are conducted synchronously online, those reviewees who have weak/intermittent connection were invited to join with the other reviewees in the designated P2Excel facility where there is a strong internet connection and could be assisted by the service providers.

After the examinations, the test scores were generated from the Prepare2Excel on-line review platform. From the results of the test, the test items that were found to be difficult among the reviewees were discussed by the designated faculty member, face-to-face with the reviewees on a scheduled day.

Meanwhile, the BLEPT scores were obtained after the release of the BLEPT results during the last week of September. These P2Excel reviewees were contacted by the researchers and with their consent, request the scores/ratings obtained in General Education, Professional Education, and Specialization. Furthermore, they were asked to give feedback on their perception of the P2Excel review program. There answers were recorded and transcribed.

Table 1. *t*-test for significant difference between diagnostic and actual BLEPT result

| Test Results | Mean | SD | df | <i>t</i> -value | <i>p</i> -value |
|--------------|-------|------|----|-----------------|-----------------|
| Diagnostic | 78.38 | 5.01 | 49 | -3.881 | .000 |
| BLEPT | 80.91 | 5.43 | | | |

Table 2. *t*-test for significant difference between PREBOARD and actual BLEPT result

| Test Results | Mean | SD | df | <i>t</i> -value | <i>p</i> -value |
|--------------|-------|------|----|-----------------|-----------------|
| PREBOARD | 81.16 | 7.90 | 49 | .286 | .776 |
| BLEPT | 80.91 | 5.43 | | | |

Data Analysis

Mean was utilized to determine the scores of the respondents in the diagnostic, preboard, and BLEPT exams. Moreover, *t*-test was used to test the significant difference between the diagnostic, preboard and BLEPT rating of the takers. To analyze the perceptions of the respondents about the P2Excel program, the researchers used the content analysis of words through key-words-in contexts (KWIC) (Ryan & Bernard, 2003). In this technique, researchers identified the key words and systematically searched the corpus of text to find all instances of the word or phrase. Each time a word is found, a copy of it is made and its immediate context.

RESULTS AND DISCUSSION

The mean score during the diagnostic test of the respondents is 78.12, during the Pre-Board is 81.58, and during the BLEPT is 80.4 (figure 1). It can be inferred that during the Pre-Board, the mean scores of the respondents had increased by 3.46. During the BLEPT, the results may be high but the mean scores had decreased by 1.18. Overall, it could be concluded that the Enhanced Review Program for BLEPT Preparation irrespective of the external variables that may have significant impacts to the results of the actual BLEPT had still paved way into pushing the positive results of the respondents.

The results also revealed that there was a significant increase in the scores obtained by the respondents in diagnostic (M= 78.38, SD=5.01) to preboard exam (M=81.16, SD=7.90), *t* (-2.455), *p*=0.18). As indicated by the *p*-value which is lower than .05, the result means that P2E program helped respondents obtain higher scores.

Likewise, it showed that there was a significant increase in the scores obtained by the respondents in

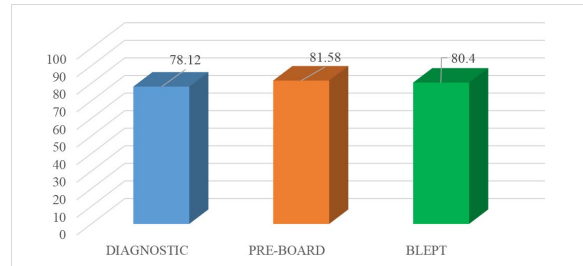


Figure 1. Mean Scores of the respondents in Diagnostic, Pre-board, and actual BLEPT results

diagnostic (M= 78.38, SD=5.01) to actual BLEPT result (M=80.91, SD=5.43), *t* (-3.881), *p*=.000). The result means that P2E program helped respondents obtain higher scores as indicated by the *p*-value which is lower than .05.

Furthermore, the results showed that there was a significant decrease in the scores obtained by the respondents in the preboard exam (M= 81.16, SD=7.90) to actual BLEPT result (M=80.91, SD=5.43), *t* (.286), *p*=.776). The result means that the intervention did not help the respondents much and other factors may have influenced their performance during the actual BLEPT exam.

Respondents Perceptions about P2E Program

To provide an overview of the respondent's perception about the P2Excel Program, the following data extracted from the interview were hereby presented. The data was sorted from the most prevalent to the least prevalent theme.

Table 3 shows the major themes that was illuminated in the interview to the respondents. The first theme, *the P2E Program is affordable*, was the most prevalent theme since most of the respondents have mentioned that the review program offers value for money. From the registration fee, they were able to obtain quality lecture. Some reviewees notice that it was even cheaper compared to the other available review programs. While others have expressed their appreciation in the flexible mode of payment.

The second theme, *the review materials in the P2E program contains quality items/ questions* means that the second phase of implementation was able to address the recommendation from the previous implementation which is to revise some inaccurate questions and answers and include a more extensive and intensive contents such as videos/pictures, illustrations.

The third theme, *the P2E program is accessible*, shows that the reviewees were delighted that the P2E Program is accessible and convenient to use. They could readily join the review and examination

Table 3. Major Themes in the Interview to Respondents

| Major Themes | Statements |
|-------------------------------------|---|
| Affordability | <i>My money was well-spent and the review program was worth it due to its quality lecture. I did not spend much to the review program thus it was worth it My money was well-spent. The program is less expensive.</i> |
| Quality | <i>The P2E has quality content and questions. The set of questions of P2E are reliable. There are a lot of HOTS questions There are plenty of analysis and situational questions which will push you to think critically You may review your score after testing</i> |
| Accessibility | <i>You don't have to always attend the face-to-face review One of its advantages is its availability because it can be accessed online. Even if you are absent, you can still review anytime. Even if you are only using a mobile data, you may still access it. The questions are even downloadable. It is very convenient to use.</i> |
| Hands-on Lecture and Support System | <i>Aside from face-to-face review, there are also review materials available. During the review, the service providers were hands-on to us.</i> |
| Effectiveness | <i>The Prepare2Excel is very useful in preparation for the Licensure Examinations for Professional Teachers We did not regret engaging to P2E. excellent! I was not able to pass the examination that is why if ever there is an online review, I will review at P2E. The P2E was commendable.</i> |

anywhere, anytime, or even through the use of their cellphones using mobile data.

Aside from the online review and examinations, there is also a schedule for face-to-face lectures with an assigned lecturer. This is how the fourth theme, *the P2E program offers hands-on lecture and support* was revealed. This is the time wherein the reviewees could make clarifications on a certain question that they found confusing or difficult.

The last theme, the over-all perception of the reviewees on the effectiveness of the P2E is that *the P2E Program is effective*. Based on the sample, **84.21%** of the reviewees have passed the examination.

CONCLUSION AND RECOMMENDATION

The Prepare2Excel program is a newly-established intervention program to help BLEPT takers to explore another alternative and experience technology-assisted atmosphere in series of pre-BLEPT tests. Based on the findings, the intervention was found out to be effective and helpful in the respondents' performance in BLEPT. It is consistent with the study of Yaki and Babagana (2018) which revealed that technology learning packages will assist in closing the gap in learning. The technological learning package has the ability to increase students' performance. Similarly, the study of Hussain and Suleman (2017) confirmed that information and communication technology (ICT) has a

beneficial impact on students' academic achievement and retention, and that ICT is more compelling, effective, and helpful in instruction than traditional methods.

It is highly recommended for the BLEPT takers for the years to come to try this breakthrough. Since this is technology-based, it is expected that data from each phase of the program can be secured well and organized for future reference. Other campuses and colleges offering Teacher Education Programs may also adopt this intervention programs. Finally, the research output can be utilized as baseline data for future interventions regarding the performance of BLEPT test takers. Results may also be considered by the college instructors and professors as basis for some enhancement strategies in the educative process.

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AUTHORS' CONTRIBUTIONS

The completion of this project would not have been made possible without the collective effort of the authors. Dr. Emelyn R. Villanueva conceptualized the project; led the data gathering of the quantitative and qualitative data; and kept a close monitoring on the completion of the project. Mr. Alvin L. Dalisay enriched the review of related literature and performed the statistical analysis of the data. Ms. Dana Kaye F. Fabiala transcribed the recorded interview. Ms. Alphee F. Lachica collected the quantitative and qualitative data and conducted the member checking of the qualitative results. While Dr. Cristina Marie J. Balderama analyzed the interview through qualitative content analysis and edited the technical aspect of the manuscript. Furthermore, the authors have worked together to ensure that everything is aligned towards the successful completion of the project.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Students and Advertising Media: Dynamics and Implications

Errol S. Foja

ABSTRACT

This study describes the dynamics of advertising media among college business students in Odiongan, Romblon and identifies the implications of such dynamics to businesses in the municipality. The dynamics described are levels of exposure to, effectiveness of and preference for, 12 current advertising media. The science of marketing management particularly its established framework for promotion is the theoretical anchor of this study. The descriptive method of research was used with the questionnaire as data gathering instrument which was distributed to 280 students at the College of Business and Accountancy of the Romblon State University, chosen through cluster, stratified and systematic random sampling procedures. The data gathered were processed for percentages and means, using SPSS, then analyzed for implications determination. The results revealed that college business students in Odiongan are often exposed to advertising media, consider such media satisfactorily effective and prefer them well. Further, the advertising media's dynamics on college business students in Odiongan have very good implications for local businesses' promotion strategies such that some advertising media should be immediately exploited, some seriously considered and some should as yet, not be considered, by these businesses.

Keywords: *advertising media, ad media dynamics, ad media implications, ad media strategies for local businesses, marketing management*

INTRODUCTION

In this age of globalization and regional integration, local businesses are even more challenged to keep themselves afloat given the influx of other domestic and foreign goods and services. According to Suranovic (2010), the availability and accessibility of various goods and services coming from different parts of the world in local shops had become a competition for locally produced products. Due to this, the need to make the presence of local businesses is imperative to create and maintain customer flow and sustain profitability.

Creating awareness of products and services is the springboard to generate customer patronage. Getting a business' message across to its markets is paramount in its arsenal of business strategies. The need to understand and harness the science of marketing then is of even more important to local businesses in this age

of open markets. Through the internet, the business has grown into a global market. It helped business owners in establishing better customer relationships by providing innovative approach to realizing customers' needs (Kurtz & Boone, 2012).

More than putting marketing into action, local businesses may put the tools of marketing management, into better use. The marketing mix is the set of controllable marketing variables that the firm blends to produce needed responses from the target market. It consists of the four Ps namely product, price, place and promotion. While all four factors are important, the very reason that they are a mix and should be well blended, is promoting and sending a responsible business message to its customers. Promotion then should be a serious business for any business (Kotler & Armstrong, 1993).

Communicating with customers though, is not a simple business. Hence, marketing management experts may need to combine personal communication like personal selling with nonpersonal forms of communication such as advertising, sales promotion, public relations, and direct marketing (Peter & Donnelly, 2004). As with marketing mix, promotion mix must blend well to give best results.

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Local businesses, however, seldom do serious promotion as they are often discouraged by the costs of their processes and just usually rely on strategic location and word of mouth to keep customer traffic flowing. Even medium and large-sized businesses are hard-pressed to use all of the components of the promotion mix and even harder pressed to blend them because of the costs the components entail. Of the components of promotion mix however, advertising is the promotion tool that local businesses can initially exploit because of its perceived immediate benefits namely: it creates awareness by providing the target market with information, it persuades customers to buy by promoting the product and its benefits and it reinforces the business' existence by consistently repeating key messages. There are also a variety of advertising media that could fit a business' promotion budget.

Local businesses can benefit from their advertising cost when their message gets to their target markets. This happens when businesses know which advertising media their customers are exposed to, and which advertising media are deemed effective and preferred by such customers. It is in this regard that this study is contextualized.

This study described the dynamics of advertising media among college business students in Odiongan, Romblon and determined its perceived effectiveness in providing necessary information. The study also identified implications of such dynamics for businesses in the municipality.

The significance of this study is underscored by the Association of Southeast Asian Nations (ASEAN) integration. The free flow of goods and services among the ten member states of ASEAN makes it even more necessary for local businesses to harness the benefits of advertising. The results of this study are therefore most useful to the local businesses for it would enable them to know and thereby exploit the dynamics of advertising among one of their key markets, the students, for their businesses' advantage. This study is also useful to the following: the economic planners of the municipality of Odiongan and other similar municipalities, as they would have data that they could use to help local businesses prosper; the local and other advertising media, as they would have the data to further hone their advertising services and tailor them to customers who are open to particular advertising strategies; the business faculty, for they would have local business environment specific data which they could use for pedagogical purposes and applications; the business students and aficionados, for they would have interesting material to study and discuss; and the research inclined people, for they would have a springboard for further studies.

METHODOLOGY

Research Method Used

This research used descriptive method, which is used to quantify attitudes, opinions, behaviors, and other defined variables. This method was used to gather the college business students' perceptions of the dynamics of advertising media and its implications. The variables used were exposure to, effectiveness of and preference for advertising media.

Locale and Time of Study

This study was conducted in the Municipality of Odiongan, Romblon specifically within the confines of the Romblon State University. The university was deemed most appropriate locale for the distribution and accomplishment of the research instrument as it was where the respondents could best focus on and ponder on their responses to the research instrument, given that the academic atmosphere was expected to make the respondents take the research exercise seriously. The study was conducted during the second semester of Academic Year 2015-2016, particularly in the months of November to February.

Research Population and Sample

This study covered college business students in the Municipality of Odiongan, Romblon. Only two educational institutions offer collegiate business programs in the municipality: the Romblon State University (RSU) and the Erhard System Technological Institute (ESTI). As the business students of ESTI constituted a very miniscule portion of the study's population, cluster sampling was used, so all the samples were taken from the Romblon State University. In the further selection from the clustered sample, stratified random sampling was applied, so proportionate numbers were taken from the four business programs of the university and such proportionate numbers were further proportionately allocated according to the curriculum year of the respondents. When the number of samples per stratum was identified, systematic random sampling was used in the distribution of the questionnaire to the respondents. The required number of samples was determined using Slovin's Formula with 5% margin of error

Records from the database of the Dean's Office of the College of Business and Accountancy showed a total population of 934 students wherein 60 students are under the Bachelor of Science in Accountancy (BSA), 307 are under the Bachelor of Science in Business Administration-Business Management (BSBA-BM), 339 are under the Bachelor of Science in Business Administration-Financial Management (BSBA-FM) and 228 are from the Bachelor of Science in Hotel and Restaurant Management (BSHRM).

Out of this population, a total of 280 respondents or 29.99% of the population are the samples of the stud; 18 respondents from BSA, 92 from BSBA-BM, 102 from BSBA-FM and 68 from BSHRM.

Research Instrument Used

The questionnaire was the data-gathering instrument of this study which was developed after a thorough review of the related literature and studies, the determination of the specific problems addressed by the study and the concretization of the variables quantified. The contents of the questionnaire were structured in the simplest and as concise manner as possible so that the respondents would not be discouraged to accomplish it. The purpose of the exercise was stated at the very beginning of the questionnaire with an assurance of the confidentiality of the responses to encourage the respondents' involvement in the accomplishment of the instrument. The questions were phrased in a very direct way to dispel any confusion and generate the most reliable data possible. Translations in Filipino were also made for some of the contents to further the respondents' understanding of the questionnaire's contents and to assure the reliability of their answers. A request was made to the dean of the College of Business and Accountancy for the researcher to disturb ongoing classes so that the chosen respondents in a given class may answer the questionnaires simultaneously and without consulting each other. Enough time was allowed for the respondents to ponder the questions and think their responses over. Questions and clarifications were encouraged to make sure that the questionnaires were properly accomplished and respondents were reminded to check that the instruments were filled up before such were returned.

Data Processing and Analysis

The responses were processed using the Statistical Packages for Social Sciences (SPSS) software to come up with percentages and mean. The percentages were used to describe the demographic profile of the respondents and the weighted means to describe their perceptions of the dynamics of advertising media.

RESULTS AND DISCUSSION

Dynamics of Advertising Media Among the College Business Students

The dynamics of advertising media in terms of the level of exposure to, level of effectiveness of and level of preference for, advertising media among college business students are presented as follows:

Table 1 presents the level of advertising media exposure and it shows that college business students are often exposed to advertising media. They are always

exposed to television and the internet; often exposed to word of mouth, transit media, magazines, brochures and newspapers; occasionally exposed to signage, radio, flyers and billboards; and seldom exposed to direct mail. The advertising media to which college business students are most exposed to are television ($M=4.69$), the internet ($M=4.54$), word of mouth ($M=4.06$) and transit media ($M=3.78$) while the advertising media to which they are least exposed are direct mail ($M=2.03$), billboards ($M=2.93$), flyers ($M=3.01$) and radio ($M=3.38$).

Table 1. Level of advertising media exposure

| Advertising Media | M | DI |
|---|--|-----------|
| Billboards | 2.93 | OC |
| Brochures | 3.55 | OF |
| Direct Mail | 2.03 | SE |
| Flyers | 3.01 | OC |
| Internet | 4.54 | AE |
| Magazines | 3.68 | OF |
| Newspapers | 3.53 | OF |
| Radio | 3.38 | OC |
| Signage | 3.49 | OC |
| Television | 4.69 | AE |
| Transit Media (vehicles, tops/shelters, streets, walls, etc.) | 3.78 | OF |
| Word of Mouth | 4.06 | OF |
| Overall Advertising Media Exposure | 3.56 | OF |
| Mean (M) | Descriptive Interpretation (DI) | |
| 4.51 – 5.00 | Always Exposed To (AE) | |
| 3.51 – 4.50 | Often Exposed To (OF) | |
| 2.51 – 3.50 | Occasionally Exposed To (OC) | |
| 1.51 – 2.50 | Seldom Exposed To (SE) | |
| 1.00 – 1.50 | Not Exposed To At All (NE) | |

Presented in Table 2 is the level of advertising media effectiveness. Advertising media are deemed satisfactorily effective by college business students. Television and the internet are deemed very effective; newspapers, word of mouth, magazines, radio, brochures and transit media are deemed satisfactorily effective; while signage, billboards, flyers and direct mail are deemed moderately effective. The advertising media deemed most effective are television ($M=4.80$), the internet ($M=4.68$), newspapers ($M=3.94$) and word of mouth ($M=3.89$) while the advertising media deemed least effective are direct mail ($M=2.81$), flyers ($M=3.28$), billboards ($M=3.35$) and signage ($M=3.47$).

Shown in Table 3 is the level of preference for advertising media. Advertising media are well preferred by the college business students. They highly prefer television and the internet; well prefer newspapers, magazines, radio, brochures, word of mouth and transit media; and moderately prefer billboards, signage, flyers and direct mail. The advertising media most preferred

are television ($M=4.75$), the internet ($M=4.68$), newspapers ($M=4.04$) and magazines ($M=3.99$) while the advertising media least preferred are direct mail ($M=2.81$), flyers ($M=3.15$), signage ($M=3.35$) and billboards ($M=3.35$).

Table 2. Level of advertising media effectiveness

| Advertising Media | M | DI |
|--|--|------------|
| Billboards | 3.35 | ME |
| Brochures | 3.65 | SEf |
| Direct Mail | 2.81 | ME |
| Flyers | 3.28 | ME |
| Internet | 4.68 | VE |
| Magazines | 3.82 | SEf |
| Newspapers | 3.94 | SEf |
| Radio | 3.80 | SEf |
| Signage | 3.47 | ME |
| Television | 4.80 | VE |
| Transit Media (vehicles, stops/shelters, streets, walls, etc.) | 3.60 | SEf |
| Word of Mouth | 3.89 | SEf |
| Overall Advertising Media Effectiveness | 3.76 | SEf |
| Mean (M) | Descriptive Interpretation (DI) | |
| 4.51 – 5.00 | Very Effective (VE) | |
| 3.51 – 4.50 | Satisfactorily Effective (SEf) | |
| 2.51 – 3.50 | Moderately Effective (ME) | |
| 1.51 – 2.50 | Fairly Effective (FE) | |
| 1.00 – 1.50 | Not Effective At All (NEf) | |

Table 3. Level of advertising media preference

| Advertising Media | M | DI |
|--|--|-----------|
| Billboards | 3.35 | MP |
| Brochures | 3.72 | WP |
| Direct Mail | 2.81 | MP |
| Flyers | 3.15 | MP |
| Internet | 4.68 | HP |
| Magazines | 3.99 | WP |
| Newspapers | 4.04 | WP |
| Radio | 3.76 | WP |
| Signage | 3.35 | MP |
| Television | 4.75 | HP |
| Transit Media (vehicles, stops/shelters, streets, walls, etc.) | 3.53 | WP |
| Word of Mouth | 3.68 | WP |
| Overall Advertising Media Preference | 3.73 | WP |
| Mean (M) | Descriptive Interpretation (DI) | |
| 4.51 – 5.00 | Highly Preferred (HP) | |
| 3.51 – 4.50 | Well Preferred (WP) | |
| 2.51 – 3.50 | Moderately Preferred (MP) | |
| 1.51 – 2.50 | Fairly Preferred (FP) | |
| 1.00 – 1.50 | Not Preferred At All (NP) | |

Implications of the Dynamics of Advertising Media to Local Businesses in the Municipality of Odiongan, Romblon

Advertising media have very good dynamics (high exposure, high effectiveness, high preference) among college business students in Odiongan, Romblon which local businesses could exploit for their promotion strategy. Television is the advertising media that has the most favorable dynamics. This has very good implications for local businesses as there is a local cable television provider in the municipality and franchising known brands, brands that have strong television presence, has become affordable. The internet's dynamics also pose very good implications, as advertising through it could be variegated and cost-effective.

Word of mouth is high on exposure and effectiveness though not as high on preference, so its usefulness as advertising media still has a big potential and like the internet, is also cost-effective. Transit media is high on exposure but not as high on effectiveness and preference which may be due to the almost total absence of transit media advertising, but such dynamics could change should transit media advertising become prevalent and well conceptualized, so its potential should be considered. Newspapers and radio have good advertising effectiveness and preference dynamics as well but they are low on exposure. If exposure is expanded, they should be prime advertising media considerations for local businesses.

Magazines are high on preference but not as high on exposure and effectiveness. As no local magazines are available, using them as advertising media will be cost-prohibitive for local businesses. Brochures, having not-so-good advertising dynamics and being also cost-prohibitive, and direct mail, having poor dynamics, should not as yet be considered by local businesses.

Billboards, flyers and signage have poor advertising media dynamics but these are established advertising media in the urban areas, and their poor dynamics could be attributable to their non-utilization or poor utilization as advertising media in the municipality. Better conceptualized and executed ads through these media could still prove beneficial to local businesses.

CONCLUSION

The college's business students are often exposed to advertising media. They are always exposed to television and the internet; often exposed to word of mouth, transit media, magazines, brochures and newspapers; occasionally exposed to signage, radio, flyers and billboards; and seldom exposed to direct mail. The students also considered advertising media satisfactorily effective. They consider television and the internet very effective; newspapers, word of mouth,

magazines, radio, brochures and transit media satisfactorily effective; and signage, billboards, flyers and direct mail moderately effective. The students highly prefer television and the internet; well prefer newspapers, magazines, radio, brochures, word of mouth and transit media; and moderately prefer billboards, signage, flyers and direct mail.

The advertising media's dynamics on college business students in Odiongan, Romblon have very good implications for local businesses' promotion strategy. Television and the internet have advertising media dynamics that should be exploited by these businesses. Word of mouth and transit media's dynamics are not as well but still good enough to be considered. The local newspapers and radio stations need to expand their exposure and they would be good enough to be considered. Magazines, brochures and direct mail having poor dynamics should as yet, not be considered. Billboards, flyers and signage have poor advertising media dynamics but better conceptualized and executed ads through these media could still prove beneficial to local businesses.

AUTHOR'S CONTRIBUTIONS

The author confirms sole responsibility for the whole manuscript and study.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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Morphological Diversity of Edible Yam (*Dioscorea spp*) in Tablas, Island, Romblon, Philippines

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ABSTRACT

Yam plants (*Dioscorea spp*), either wild or cultivated, propagate naturally and are highly productive crops even in marginal areas adapted to diverse conditions. This crop plays a vital role in the lives of many people, as a staple food, feedstuff to livestock/poultry and medicine. However, limited study was conducted on the morphological characterization of edible yams in Tablas Island, Romblon. This study was conducted to determine the morphological characteristics of the existing yam in the province. The different accessions from seven species were collected from cultivated and wild species and were assessed using the descriptors for yams proposed by International Plant Genetic Resources Institute and the National Plant Genetic Resources Laboratory to characterize the yam. Data on morphological diversity were analyzed using descriptive statistics such as percentage and frequency. Eighty-six morphological characters were used in morphological characterization and in assessing the genetic diversity of accessions using the Shannon-Weaver Index. Frequency distribution per trait was determined for the calculation of diversity. The mean H' of the qualitative and quantitative traits was high, $H=0.62$ and $H=0.83$, respectively. The qualitative and quantitative traits have shown normal frequency distribution indicating a wide variation of yam accessions in Tablas Island.

Keywords: *accession, characterization, Dioscorea spp., diversity index, morphological diversity*

INTRODUCTION

The Philippines has a diverse collection of *Dioscorea* species totaling about 600 accessions (Acedo & Arradaza, 2012). However, only two species are widely grown and cultivated for food, *D. alata* (purple yam) and *D. esculenta* (lesser yam). Other rarely cultivated species, *D. hispida* (Asiatic bitter yam) and *D. bubifera* (aerial yam) are grown mainly in the wild and forests at low to medium altitudes for medicinal purposes. The wild tubers also act as a “safety net” for local people during their critical time of drought and famine. Approximately 50 species are consumed as wild-harvested staples or famine food. The most well-known species is *Dioscorea villosa* L., also called wild yam, and is native to North America (Avula et al., 2014).

In the Philippines, the greater yam is widely known as *ube* and utilized as food delicacy, which is

popular because of its purple color and exceptional taste. It is cooked as *halaya*, *puto*, *sagobe*, *halo halo*, among others. It has also become a great favorite for ice cream, tarts, cakes, bread, etc.

Romblon encompasses seven islands and has Tablas as the largest of nine municipalities. Topographically, extensive mountain ranges characterize the area, it has streams, gullies, creeks, and rivers draining into adjacent municipalities and finally to the lowlands. The island economy is agriculturally based and planted with varied crops and domesticated animals. Root crop production is grown on a small scale and frequently consumed for subsistence and if blessed with good harvest, farmers bring the product to the market.

Based on the report of the Philippine Statistics Authority (PSA, Romblon), as of 2018, the area harvested for yam is 19.85 hectares with a total production of 159.29 MT. In 2019, it had a production of only 157.19 MT. This shows that there was a decrease in production in the entire province.

Yam (*Dioscorea* species) is grown in most of Romblon province. It thrives well in all kinds of soil, is very productive, and needs a small number of inputs for cultivation and production. It is one of the leading high calorie-staple crops which is of great help when foods

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are insufficient. It is served as an alternative to rice, cooked with meat and other vegetables, and as dessert or snack. Yam is a source of industrial products like starch, feedstuff, and functional food. Worldwide, 55 percent of root crop production is utilized as food, and the rest is for feedstuff and industrial products. Olojede (2013), reported that root crops can increase the resources for consumption for food, food security, economic development, and poverty alleviation. According to Sheikh et al. (2009), in terms of utilization for food, *Dioscorea bulbifera*, and *Dioscorea pentaphylla* are popular to consume. The tubers and bulbils of *Dioscorea alata* are utilized as starch for cooking in various ways. They are processed as yam flakes or flour, and used as medicine and feedstuff in Southeast Asia. The species with purple flesh are used for manufacturing ice cream, cakes, and others (USDA-ARS, 2012).

The edible tuber species are an essential food source and have a significant place in the dietary lifestyle among marginal families during food scarcity (Ogbonna et al., 2017).

During scarce situations, stormy days and extreme conditions, people in the rural areas collect different wild corms, and tuber root crops to augment food supply. Sometimes they barter them to nearby barangays with some goods. They also mix tubers with rice (Medhi & Borthakur, 2011).

The traditional ways of preparing and consuming edible yams depend on the local traditions and available species (Idusogie and Olayide, 1977). Some of the *Dioscorea* species are bitter, and the local people are using traditional skills to remove its bitterness.

The *Dioscorea* species known locally by its vernacular name are *Binangkal*, *Burot* or *Yapisan*, *Paladamo*, *Namo*, *Patatas*, *Sap-ang*, *Sinawa*, *Ube*, or *Tapoy*, *Umag*, naturally grows at the mountainous or hilly part of the island and some are cultivated at the lowland areas. The occurrence of the same cultivar of yam having different local names is expected on the island. The exchange of planting materials or the casual transport from other places among farmers resulted in speciation and have been named differently or have changed its local name from its point of origin (Beyerlein & Dos Santos, 2018).

Massive production of yam is not in practice in the locality probably due to poor market access, lack of knowledge on diversity, potentials, and uses of this crop, but when given attention, it will form part of the sustainable program of the province.

Through morphological characterization of both cultivated and wild species, there is a need to differentiate various species to produce a great variant species that would be of great value in crop development and for its future potential use. Hence, this study was conducted.

Objectives of the Study

The general objective of the study is to evaluate the morphological diversity of edible yam (*Dioscorea* species) from the nine municipalities of Tablas Island. Specifically, the study aimed to analyze their morphological diversity and hierarchical clustering.

METHODOLOGY

Figure 1 shows the collection site of yam accessions. Highlighted in blue-violet in the northern part was the municipality of San Agustin, red for Calatrava, avocado green for San Andres in western part, pink for Odiongan, green for Ferrol, blue purple for Looc, in southern part, yellow green for Santa Fe, and for the eastern part, brown for Alcantara and red purple for Santa Maria.

The samples were taken either from the field or

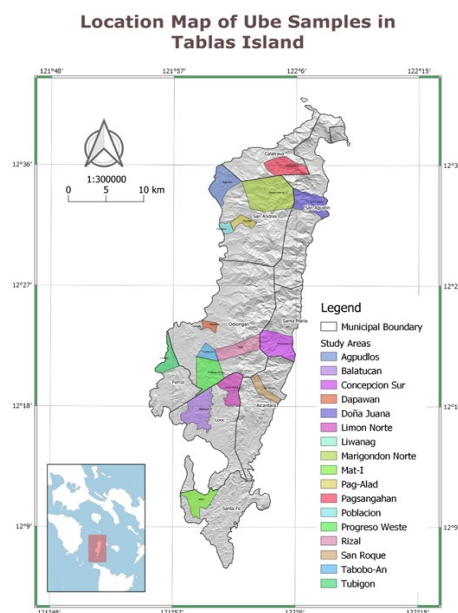


Figure 1. Location of various yam accessions and collection (*Dioscorea* species) in Tablas Island

farm or from uncultivated areas. The coordinates were taken using Geocam, and a location map was generated using GIS Software. A total of 70 yam population (comprising seven species) were randomly collected from the different collection sites on the Island.

On-site characterization of the accessions, specifically the stem, leaves, flower, fruit, and aerial tubers, was conducted during the field survey patterned on the descriptor proposed by International Plant Genetic Resources Institute's (IPGRI, 1997), and the National Plant Genetic Resources Laboratory (NPGRL) at the Los Banos Institute of Plant Breeding.

Eighty-six morphological traits (71 quantitative and 15 qualitative) were recorded. The quantitative measurements on 15 traits were taken for petiole, internode, stem, leaf size, length, and width using a meter ruler and caliper, while the 71 qualitative traits of yam were recorded directly upon measurement using scores of 1-11 scales or as a binary recording (1= Present and 0= Absent).

Data on morphological diversity were analyzed using descriptive statistics such as percentage and frequency. Seventy yam accessions were used to conduct the morphological characterization and assess the phenotypic diversity of the collection using Shannon Weaver Index.

The data on morphological characters were subjected to multivariate analysis and principal component analysis to identify the most discriminating morphological characters. The matrix of similarity was generated based on distance coefficients. The distance matrix was subjected to hierarchical cluster analysis using Euclidean distance.

To identify the similarity of the morphological characters of the collected accessions, the 70 yam accessions were clustered in groups based on their close relationships. The dendrogram of the hierarchical cluster analysis (HCA) is shown in Figure 6. The similarity pattern of clustering was determined to assess the accessions grouping in a cluster. This analysis was used to study the patterns of variation and relationships among each accession, where accessions with close genetic distances were placed near each other in the dendrogram.

RESULTS AND DISCUSSION

Collection Areas of Dioscorea spp in Tablas Island

Tablas is the largest island in the province of Romblon. IT is subdivided into nine municipalities, namely: Alcantara, Calatrava, Ferrol, Looc, Odiongan, San Agustin, San Andres, Santa Fe, and Santa Maria (Figure 1) wherein yam accessions were collected either from fields or farms as wild or cultivated. Most of the collection sites were highly elevated, the topography is somewhat hilly, steep, and slopey, and only a few are from flat areas.

The collected accessions were established in an off-campus area at 43.5 masl, at latitude 12°24'21"N and longitude 121°59'24"E. It is a flat well-drained area. The plants are watered daily or depending on the weather condition. Regular weeding was done by hand weeding to minimize the growth of the weeds. Later, a bamboo stake was set up to train the growing yams and to avoid creeping on the land.

Morphological Characterization and Diversity of Yam (Dioscorea spp.)

As shown in Table 1, out of the 71 selected qualitative traits of *Dioscorea spp.* no variation (H=0) was found in the presence of waxiness, barky patches, flowering, sex, inflorescence position, flower's color, inflorescence type, and absence or presence of corms of yam.

The presence of wings, hairs, spines and wing color of the young stem had low diversity (H=0.43, 0.46, 0.41, and 0.58, respectively), while the stem color had high diversity (H=0.76) where most of the accessions (71.5%) had purple stem color.

The presence of waxiness on the mature stem had low diversity (H=0.22), while the vigor, stem color, wing color, and spines on the stem base had high diversity (H=0.72, 1.0, and 0.78, respectively). The majority of the accessions (75.7%) had an intermediate vigor stem, had shown purplish-green stem color (60%), possessed purple wing color (52.9%), and few accessions (24.3%) did not have wings. Most of the accessions (78.6%) do not display spines on the stem, and only a few (11.4%) exhibited an intermediate spine on the stem.

As to young leaves, the first leaf emergence and hairiness surface of leaves had low density (H=0.50 and H=0.43), while the leaf color, leaf margin color, vein color, petiole color, and petiole wing color had high diversity (H=1.19, H=0.69, H=0.86, H=0.87, and H=0.64, respectively). Most of the accessions (41.4%) displayed purple leaf color, with purple leaf margin color (75.7%), and displayed pale green vein color (65.7%). The majority of the accessions (70%) displayed all purplish-green with purple at both ends petiole color, possessed purple petiole wing color (72.9%), and some did not have a wing (25.7%).

The leaf color, vein color, margin color, distance between lobes, and tip color of mature leaves had low density (H=0.48, H=0.38, H=0.38, H=0.26, and H=0.22, respectively), while the position of leaves, leaf density, leaf vein color upper surface, and position of the broadest part high diversity (H=0.97, H=0.89, H=0.62, and H=0.69, respectively). Most of the accessions (48.6%) had an opposite position of leaves, displayed intermediate leaf density, exhibited green leaf vein color on the upper surface of the leaves, and the position of the widest part of leaves was found in the middle. The leaf shape and petiole color had a very high density (H=1.25 and H=1.09, respectively).

On the other hand, different types of leaf shapes were noticed where most of the accessions (44.3%) had a cordate leaf shape, cordate broad (34.28%), sagittate long (35.71%), while two accessions had trilobed (2.9%) and only one with compound leaves (1.4%). Also, variation in petiole color was recognized wherein most of the accessions (42.9%) possessed all purplish-

green with a purple base. The rest are having all purplish-green with purple at both ends, green, all green with a purple base, brownish-green, and all green with purple at both sides (20%, 18.6%, 10%, 5.7%, and 2.8%, respectively).

Table 1. Diversity indices (H') of 70 qualitative traits in yam.

| TRAIT DESCRIPTOR | COLLECTION SHOWING THE TRAIT | | |
|---|------------------------------|-------|-------------|
| | No. | % | H' |
| YOUNG STEM | | | |
| 1. Stem color | | | 0.76 |
| Green | 12 | 17.1 | |
| Purplish Green | 7 | 10 | |
| Brownish Green | 1 | 1.4 | |
| Purple | 50 | 71.5 | |
| 2. Presence of Waxiness | | | 0 |
| Absent | 0 | 0 | |
| Present | 70 | 100 | |
| 3. Presence of Wings | | | 0.43 |
| Absent | 11 | 15.17 | |
| Present | 59 | 84.3 | |
| 4. Presence of Hairs | | | 0.46 |
| Absent | 58 | 82.9 | |
| Present | 12 | 17.1 | |
| 5. Presence of Spines | | | 0.41 |
| Absent | 60 | 85.7 | |
| Present | 10 | 14.3 | |
| 6. Presence of Barky Patches | | | 0 |
| Absent | 70 | 70 | |
| Present | 0 | 0 | |
| 7. Wing Color After 20 days of Emergence | | | 0.58 |
| Green with purple edges | 51 | 72.9 | |
| None | 19 | 27.1 | |
| MATURE STEM | | | |
| 8. The vigor of mature stem | | | 0.72 |
| Low | 9 | 12.9 | |
| Intermediate | 53 | 75.7 | |
| High | 8 | 11.4 | |
| 9. Stem Color | | | 1 |
| Green | 8 | 11.4 | |
| Purplish Green | 42 | 60 | |
| Brownish Green | 12 | 17.1 | |
| Dark Brown | 8 | 11.4 | |
| 10. Presence of waxiness | | | 0.22 |
| Absent | 66 | 94.3 | |
| Present | 4 | 5.7 | |
| 11. Wing color | | | 0.78 |
| Green | 1 | 1.4 | |
| Green with Purple Edge | 14 | 20 | |
| Purple | 37 | 52.9 | |
| Mixture | 1 | 1.4 | |
| No Response | 17 | 24.3 | |
| 12. Spines on stem base | | | 0.78 |
| Few | 5 | 7.1 | |
| Intermediate | 8 | 11.4 | |
| Many | 2 | 2.9 | |
| None | 55 | 78.6 | |
| 13. First leaf emergence | | | 0.5 |
| Early | 14 | 20 | |
| Late | 56 | 80 | |
| 14. Leaf color | | | 1.19 |
| Pale Green | 4 | 5.7 | |
| Dark Green | 11 | 15.7 | |
| Purplish Green | 26 | 37.1 | |
| Purple | 29 | 41.4 | |

| TRAIT DESCRIPTOR | COLLECTION SHOWING THE TRAIT | | |
|---|------------------------------|-------|-------------|
| | No. | % | H' |
| 15. Leaf margin color | | | 0.69 |
| Green | 13 | 18.6 | |
| Purple | 53 | 75.7 | |
| Purple Green | 4 | 5.7 | |
| 16. Vein color | | | 0.86 |
| Green | 16 | 22.9 | |
| Pale Green | 46 | 65.7 | |
| Purple | 8 | 11.4 | |
| 17. Petiole color | | | 0.87 |
| All Green with Purple at Both Ends | 3 | 4.3 | |
| All Purplish Green with Purple Base | 4 | 5.7 | |
| All Purplish Green with Purple at Both Ends | 49 | 70 | |
| Green | 14 | 20 | |
| 18. Petiole wing color | | | 0.64 |
| Green with Purple Edges | 1 | 1.4 | |
| Purple | 51 | 72.9 | |
| No Response | 18 | 25.7 | |
| 19. Hairiness surface of leaves | | | 0.43 |
| Both | 11 | 15.7 | |
| none | 59 | 84.3 | |
| MATURE LEAVES | | | |
| 20. Position of leaves | | | 0.97 |
| Alternate | 28 | 40 | |
| Opposite | 34 | 48.6 | |
| Alternate at Base/Opposite above | 8 | 11.4 | |
| 21. Leaf density | | | 0.89 |
| Low | 10 | 14.3 | |
| Intermediate | 45 | 64.3 | |
| High | 15 | 21.4 | |
| 22. Leaf color | | | 0.48 |
| Pale Green | 13 | 18.6 | |
| Dark Green | 57 | 81.4 | |
| 23. Leaf vein color (upper surface) | | | 0.62 |
| Yellowish | 1 | 1.4 | |
| Green | 55 | 78.6 | |
| Pale Green | 13 | 18.6 | |
| Purple Green | 1 | 1.4 | |
| 24. Leaf vein color (lower surface) | | | 0.38 |
| Green | 61 | 87.1 | |
| Purple | 9 | 12.9 | |
| 25. Leaf margin color | | | 0.38 |
| Green | 61 | 87.1 | |
| Purple | 9 | 12.9 | |
| 26. Leaf shape | | | 1.25 |
| Cordate | 18 | 25.71 | |
| Cordate Broad | 24 | 34.29 | |
| Sagitate Long | 25 | 35.71 | |
| Trilobe | 2 | 2.8 | |
| Compound | 1 | 1.4 | |
| 27. Distance between lobes | | | 0.26 |
| No Measurable Distance | 5 | 7.1 | |
| Intermediate | 65 | 92.9 | |
| 28. Position of the widest part | | | 0.69 |
| Third Upper | 33 | 47.1 | |
| Middle | 37 | 52.9 | |
| 29. Tip color | | | 0.22 |
| Light Green | 66 | 94.3 | |
| Purple/Green | 4 | 5.7 | |
| 30. Petiole color | | | 1.09 |
| All Green with Purple Base | 7 | 10 | |
| All Green with Purple at Both Sides | 2 | 2.8 | |

| TRAIT DESCRIPTOR | COLLECTION SHOWING THE TRAIT | | |
|--|------------------------------|-------|-------------|
| | No. | % | H' |
| All Purplish Green with Purple Base | 30 | 42.9 | |
| All Purplish Green with Purple at Both Ends | 14 | 20 | |
| Green | 13 | 18.6 | |
| Brownish Green | 4 | 5.7 | |
| 31. Flower | | | 0 |
| Flowering in some years | 2 | 2.85 | |
| No Response | 68 | 97.15 | |
| 32. Sex | | | 0 |
| Female | | | |
| Male | 2 | 2.85 | |
| No Response | 68 | 97.15 | |
| 33. Inflorescence position | | | 0 |
| Pointing Upwards | | | |
| Pointing Downwards | 2 | 2.85 | |
| No Response | 68 | 97.15 | |
| 34. Average of Inflorescence flower | | | 0 |
| <10 | | | |
| 11-29 | 2 | 2.85 | |
| >30 | | | |
| No Response | 68 | 97.15 | |
| 35. Flower color | | | 0 |
| Purplish | | | |
| White | 2 | 2.85 | |
| Yellowish | | | |
| No Response | 68 | 97.15 | |
| 36. Inflorescence type | | | 0 |
| Spike | | | |
| Raceme | 2 | 2.85 | |
| Panicle | | | |
| No Response | 68 | 97.15 | |
| 37. Fruit formation | | | 0.62 |
| No | 9 | 12.9 | |
| Yes | 32 | 45.7 | |
| No Response | 29 | 41.4 | |
| 38. Fruit development | | | 0.63 |
| Mostly Well-Developed | 23 | 32.9 | |
| Mostly Poorly Developed | 9 | 12.9 | |
| No Response | 38 | 54.3 | |
| 39. Fruit position | | | 0.46 |
| Pointing Upward | 2 | 2.9 | |
| Pointing Downward | 30 | 42.9 | |
| No Response | 38 | 54.3 | |
| 40. Hairiness | | | 0.66 |
| Sparse | 20 | 28.6 | |
| Dense | 12 | 17.1 | |
| No Response | 38 | 54.3 | |
| 41. Absence/presence of waxiness in fruit | | | 0.5 |
| Absent | 29 | 41.4 | |
| Present | 3 | 4.3 | |
| No Response | 38 | 54.3 | |
| 42. Absence/presence of dark spot inside fruits | | | 0.36 |
| Absent | 32 | 45.7 | |
| Present | | | |
| No Response | 38 | 54.3 | |
| 43. Absence/presence of seeds | | | 0.36 |
| Absent | 32 | 45.7 | |
| Present | | | |
| No Response | 38 | 53.3 | |
| 44. Seed shape | | | 0.36 |
| None | 32 | 45.7 | |
| No Response | 38 | 54.3 | |
| 45. Seed wing structure | | | 0.36 |
| None | 32 | 45.7 | |
| No Response | 38 | 54.3 | |
| 46. Absence/ presence of aerial tubers | | | 0.42 |

| TRAIT DESCRIPTOR | COLLECTION SHOWING THE TRAIT | | |
|--|------------------------------|------|-------------|
| | No. | % | H' |
| Absent | 1 | 1.4 | |
| Present | 31 | 44.3 | |
| No Response | 38 | 54.3 | |
| 47. Surface texture | | | 0.67 |
| Wrinkled | 18 | 25.7 | |
| Rough | 14 | 20 | |
| No Response | 38 | 54.3 | |
| 48. Aerial tuber shape | | | 0.74 |
| Oval | 3 | 4.3 | |
| Oval-Oblong | 2 | 2.9 | |
| Flattened | 3 | 4.3 | |
| Irregular | 24 | 34.3 | |
| No Response | 38 | 54.3 | |
| 49. Flesh color | | | 0.62 |
| Light Purple | 2 | 2.9 | |
| Purple | 10 | 14.3 | |
| White with Purple | 6 | 8.6 | |
| Outer Purple/Inner Yellowish | 3 | 4.3 | |
| No Response | 49 | 70 | |
| 50. Skin color | | | 0.73 |
| Greyish | 2 | 2.9 | |
| Light Brown | 9 | 12.9 | |
| Dark Brown | 21 | 30 | |
| No Response | 38 | 54.3 | |
| 51. Relationship of tubers | | | 0.76 |
| Completely Separate and Distant | 1 | 1.4 | |
| Completely Separate but Close Together | 33 | 47.1 | |
| Fused at Neck | 36 | 51.4 | |
| 52. Absence/presence of corms | | | 0 |
| Present | 70 | 100 | |
| Absent | 0 | | |
| 53. Corm size | | | 1.09 |
| Small | 23 | 32.9 | |
| Intermediate | 28 | 40 | |
| Large | 19 | 27.1 | |
| 54. Sprouting at harvest | | | 0.23 |
| No | 66 | 94.3 | |
| Yes | 4 | 5.7 | |
| 55. The tendency of tubers to branch | | | 0.99 |
| Unbranched | 7 | 10 | |
| Slightly Branched | 16 | 22.9 | |
| Branched | 44 | 62.9 | |
| Highly Branched | 3 | 4.3 | |
| 56. Place where tubers branches | | | 0.39 |
| Upper Third | 63 | 90 | |
| Middle | 3 | 4.3 | |
| Lower Third | 4 | 5.7 | |
| 57. Tuber shape | | | 1.38 |
| Oval | 7 | 10 | |
| Oval-Oblong | 9 | 12.9 | |
| Cylindrical | 8 | 11.4 | |
| Irregular | 35 | 50 | |
| Elongated | 11 | 15.7 | |
| 58. Roots on the tuber surface | | | 1.13 |
| Few | 21 | 30 | |
| Intermediate | 30 | 42.9 | |
| Many | 18 | 25.7 | |
| System | 1 | 1.4 | |
| 59. Place of roots on the tuber | | | 0.15 |
| Upper | 1 | 1.4 | |
| Entire Tuber | 68 | 97.1 | |
| No Response | 1 | 1.4 | |
| 60. Absence/presence of cracks on the tuber surface | | | 0.26 |
| Absent | 65 | 92.9 | |

| TRAIT DESCRIPTOR | COLLECTION SHOWING THE TRAIT | | |
|--|------------------------------|------|-------------|
| | No. | % | H' |
| Present | 5 | 7.1 | |
| 61. Tuber skin color (beneath the bark) | | | 1.36 |
| Light Marron | 14 | 20 | |
| Dark Maroon | 29 | 41.4 | |
| Greyish | 1 | 1.4 | |
| Light Yellow | 2 | 2.9 | |
| Yellow Orange | 3 | 4.3 | |
| Yellow | 7 | 10 | |
| Off White | 9 | 12.9 | |
| Orange | 2 | 2.9 | |
| White | 2 | 2.9 | |
| No Response | 1 | 1.4 | |
| 62. Hardness of tuber | | | 0.61 |
| Hard | 48 | 68.6 | |
| Easy | 21 | 30 | |
| No Response | 1 | 1.4 | |
| 63. Uniformity of flesh color in cross-section | | | 0.71 |
| No | 24 | 34.3 | |
| Yes | 45 | 64.3 | |
| No Response | 1 | 1.4 | |
| 64. Texture of flesh | | | 0.97 |
| Smooth | 42 | 60 | |
| Grainy | 19 | 27.2 | |
| Very Grainy | 8 | 11.4 | |
| No Response | 1 | 1.4 | |
| 65. Flesh oxidation color | | | 1.4 |
| Grey | 1 | 1.4 | |
| Purple | 30 | 42.9 | |
| Orange | 15 | 21.4 | |
| Off-White | 11 | 15.7 | |
| Brown | 3 | 4.3 | |
| Light Brown | 2 | 2.9 | |
| Light Purple | 2 | 2.9 | |
| Light Yellow | 1 | 1.4 | |
| Purplish Brown | 1 | 1.4 | |
| White | 1 | 1.4 | |
| Yellow | 2 | 2.9 | |
| No Response | 1 | 1.4 | |
| 66. Skin color at the head of the tuber | | | 1.3 |
| Yellowish White or Off White | 9 | 12.9 | |
| Yellow | 5 | 7.1 | |
| Orange | 6 | 8.6 | |
| Light Purple | 6 | 8.6 | |
| Purple | 30 | 42.9 | |
| Purple with White | 3 | 4.3 | |
| White with Purple | 6 | 8.6 | |
| Yellow with Purple | 1 | 1.4 | |
| Outer Purple/Inner Yellowish | 1 | 1.4 | |
| No Response | 3 | 4.3 | |
| 67. Flesh color at a central transverse cross-section | | | 1.63 |
| White | 3 | 4.3 | |
| Yellowish White or Off White | 11 | 15.7 | |
| White | | | |
| Yellow | 5 | 7.1 | |
| Orange | 8 | 11.4 | |
| Light Purple | 5 | 7.1 | |
| Purple | 19 | 27.1 | |
| Purple with White | 7 | 10 | |
| White with Purple | 10 | 14.3 | |
| White with Pink | 1 | 1.4 | |
| No Response | 1 | 1.4 | |
| 68. Flesh color at the lower part of a tuber | | | 2.02 |
| Yellowish White or Off White | 16 | 22.9 | |
| White | | | |
| Yellow | 4 | 5.7 | |

| TRAIT DESCRIPTOR | COLLECTION SHOWING THE TRAIT | | |
|---|------------------------------|------|-------------|
| | No. | % | H' |
| Orange | 3 | 4.3 | |
| Light Purple | 6 | 8.6 | |
| Purple | 18 | 25.7 | |
| Purple with White | 6 | 8.6 | |
| White with Purple | 9 | 12.9 | |
| White with Pink | 3 | 4.3 | |
| 69. Tuber skin thickness (mm) | | | 0.74 |
| < 1mm | 27 | 38.6 | |
| > 1mm | 42 | 60 | |
| No Response | 1 | 1.4 | |
| 70. Time for flesh oxidation after cutting | | | 0.47 |
| <1 min | 12 | 17.1 | |
| 1-2 min | 57 | 81.4 | |
| No Response | 1 | 1.4 | |
| Mean | | | 0.62 |

As to fruit, the fruit position, absence/presence of waxiness, dark spots inside fruits, absence/presence of seeds, seed shape, and seed wing structure had low density (H=0.46, H=0.50, H=0.36, 0.36, 0.36, and 0.36, respectively). In contrast, fruit formation, fruit development, and hairiness had high diversity (H=0.62, H=0.63, and H=0.66, respectively).

Most accessions (45.7 %) manifested fruit formation, and only 12.9 percent were non-bearing fruit. Also, 32.9 percent of the accessions showed well-developed fruits, and 12.9 percent had poorly developed fruits and evidence of sparse hairiness (28.6%) on the fruit.

The absence/presence of aerial tubers had a low diversity (H=0.42), while the surface texture, aerial tuber shape, flesh color, and skin color had high diversity indices (H=0.67, H=0.74, H=0.62, and H=0.73, respectively). Among the accessions (25.7%) had manifested wrinkled surface texture, with rough surface texture (20.0%), and irregular tuber shape (34.3%).

The dominant flesh color was purple (14.3%), followed by white with purple (8.6%), outer purple/inner yellowish flesh color (4.3 %), and light purple (2.9%). Similarly, most of the accessions (30%) had dark brown skin color, others had light brown skin color (12.9%) and a few had a greyish skin color (2.9%).

As to underground tubers, sprouting at harvest, the place where tubers branch, place of roots on the tuber, absence/presence of cracks on the tuber surface, and time for flesh oxidation after cutting had low density (H=0.23, H=0.39, H=0.15, H=0.26, and H=0.47, respectively) while the tendency of tubers to branch, hardness of tuber, uniformity of flesh color in cross-section, the texture of flesh, and tuber skin thickness had high diversity (H=0.99, H=0.61, H=0.71, H=0.97, and H=0.74, respectively) and the corm size, tuber shape, roots on the tuber surface, tuber skin color (beneath the tuber, flesh color at a central transverse cross-section,

and flesh color at the lower part of a tuber had a very high density (H=1.09, H=1.38, H=1.13, H=1.36, H=1.40, H=1.30, H=1.63, and H=2.02, respectively).

Most of the tubers' accessions (62.9%) had branched, hard when cut (68.6%), displayed uniformity on its flesh color in cross-section (64.3%), and had smooth texture flesh when cut across (60.0%). The highest variation was observed in the flesh color at the lower part of a tuber (H=2.02), flesh color at a central transverse cross-section (H=1.63), flesh oxidation color (H=1.40), tuber shape (H=1.38), tuber skin color (beneath the bark) (H=1.36), skin color at the head of the tuber (H=1.30), roots on the tuber surface (H=1.13), and the corm size (H=1.09).

Most of the accessions (40.0%) had intermediate corm size, had an irregular shape (50%), and manifested intermediate roots on the tuber surface (42.9%). Variation in tuber skin color has been recorded, wherein most of the accessions (41.4%) had dark maroon skin color beneath the bark, displayed purple skin color at the head (42.9%), manifested purple flesh color at the central transverse cross-section (27.1%), displayed purple flesh color at the lower part of tuber (25.7%), and had observed purple flesh oxidation color (42.9%).

Diversity Indices of 15 Quantitative Traits in Yam

No variation (H=0.0) was found in the average number of inflorescence/flowers of the fifteen quantitative traits measured. The time for flesh oxidation had a relatively low diversity (H=0.47). Tuber length had the highest diversity index (H=1.34); most of the accessions (30%) measured 21 cm to 30 cm long. Similarly, the number of days to emergence of the young stem and the number of internodes had the highest diversity (H=1.29 and 1.08, respectively).

Table 2. Diversity indices (H') of 15 quantitative traits in yam.

| TRAIT DESCRIPTOR | COLLECTIONS SHOWING THE TRAIT | | | H' |
|--|-------------------------------|------|--|-------------|
| | No. | % | | |
| | | | | |
| 1. Number of days to emergence of young stem | | | | 1.29 |
| 0 and below | 9 | 12.9 | | |
| 51 to 100 | 24 | 34.3 | | |
| 101 to 125 | 26 | 37.1 | | |
| 125 and above | 11 | 15.7 | | |
| 2. Stem Length | | | | 0.76 |
| 30 to 50 | 49 | 70 | | |
| 51 to 70 | 17 | 24.3 | | |
| 71 and above | 4 | 5.7 | | |
| 3. Number of internodes (no) – young stem | | | | 1.08 |
| 5 and below | 19 | 27.1 | | |
| 6 | 30 | 42.9 | | |
| 7 and above | 21 | 30 | | |
| 4. Stem height (m) | | | | 0.62 |
| 2 to 10 meters | 22 | 31.4 | | |
| More Than 10 meters | 48 | 68.6 | | |
| 5. Number of internode to the first branching | | | | 0.86 |
| 5 and below | 17 | 24.3 | | |

| TRAIT DESCRIPTOR | COLLECTIONS SHOWING THE TRAIT | | | H' |
|--|-------------------------------|-------|--|-------------|
| | No. | % | | |
| | | | | |
| 6 to 9 | 47 | 67.1 | | |
| 10 and above | 5 | 7.1 | | |
| No Response | 1 | 1.4 | | |
| 6. Length of internode (cm) | | | | 0.91 |
| 10 and below | 15 | 21.4 | | |
| 11 to 13 | 46 | 65.7 | | |
| 14 and above | 8 | 11.4 | | |
| System | 1 | 1.4 | | |
| 7. Wing size (mm) | | | | 0.61 |
| Less Than 1mm | 16 | 22.9 | | |
| 1 to 2 mm | 53 | 75.7 | | |
| More than 2 mm | 1 | 1.4 | | |
| 8. Number of leaves (30 days after emergence) | | | | 0.89 |
| 7 and below | 27 | 38.6 | | |
| 8 to 10 | 38 | 54.3 | | |
| 11 and above | 5 | 7.1 | | |
| 9. Leaf width (cm) | | | | 0.94 |
| 9 and below | 21 | 30 | | |
| 10 to 14 | 40 | 57.1 | | |
| 15 to 20 | 9 | 12.9 | | |
| 10. Leaf length (cm) | | | | 1.21 |
| 9 and below | 9 | 12.9 | | |
| 10 to 14 | 29 | 41.4 | | |
| 15 to 20 | 26 | 37.1 | | |
| 20 and above | 6 | 8.6 | | |
| 11. Average of Inflorescence flower | | | | 0 |
| <10 | | | | |
| 11-29 | 2 | 2.85 | | |
| >30 | | | | |
| No Response | 68 | 97.15 | | |
| 12. Fruit size (cm) | | | | 0.61 |
| < 3 cm | 8 | 11.4 | | |
| > 3 cm | 24 | 34.3 | | |
| No Response | 38 | 54.3 | | |
| 13. The number of tubers per hill (no.) | | | | 0.73 |
| One | 26 | 37.1 | | |
| Few (2-5) | 43 | 61.4 | | |
| Several (>5) | 1 | 1.4 | | |
| 14. Tuber length (cm) | | | | 1.34 |
| 10 and below | 18 | 25.7 | | |
| 11 to 20 | 22 | 31.4 | | |
| 21 to 30 | 21 | 30 | | |
| 31 and above | 9 | 12.9 | | |
| 15. Tuber width (cm) | | | | 0.99 |
| 10 and below | 36 | 51.4 | | |
| 11 to 15 | 23 | 32.9 | | |
| 16 and above | 11 | 15.7 | | |
| Mean | | | | 0.86 |

Most accessions (37.1%) had been observed to emerge from 101 to 125 days after planting with six internodes. Also, the leaf length of the mature stem had the highest genetic diversity (H= 1.21) where most accessions (41.4%) measure 10 to 14 cm long. The stem length of the young stem had high diversity index (H= 0.76), whereas most of the accessions (70%) had a stem length of 30 to 50 cm long. Similarly, the stem height, number of internodes to first branching, internode length, and wing size of the mature stem had high genetic diversity (H=0.62, 0.86, 0.91, and 0.61, respectively). The majority of the accessions (68.6%) had a height of more than 10 meters, with 6 to 9

Table 3. Principal component scores (PCn) of 62 traits of 70yam (*Dioscorea spp.*) accessions.

| TRAITS | PC1 | PC2 | PC3 | PC4 | PC5 | PC6 | PC7 | PC8 | PC9 | PC10 |
|---------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|---------------|
| SC | 0.235 | -0.112 | 0.04 | -0.156 | -0.007 | -0.017 | 0.016 | -0.008 | -0.018 | -0.046 |
| APW | 0.19 | 0.06 | 0.129 | 0.075 | 0.14 | 0.043 | 0.072 | -0.136 | -0.063 | 0.087 |
| APH | -0.214 | -0.024 | -0.062 | -0.036 | -0.167 | -0.026 | -0.092 | 0.106 | 0.016 | 0.009 |
| APS | -0.253 | -0.103 | 0.079 | -0.047 | -0.076 | -0.006 | -0.021 | 0.017 | 0.061 | -0.025 |
| WC | -0.246 | 0.161 | -0.05 | 0.049 | -0.006 | -0.069 | -0.031 | 0.018 | -0.05 | 0.047 |
| V | 0.046 | 0.08 | 0.125 | 0.098 | 0.026 | 0.254 | -0.237 | 0.126 | 0.23 | 0.041 |
| SC1 | -0.16 | -0.083 | 0.129 | 0.003 | -0.048 | 0.099 | -0.2 | -0.176 | -0.022 | -0.036 |
| APWx1 | -0.03 | 0.168 | -0.016 | -0.07 | -0.04 | -0.199 | 0.107 | 0.034 | -0.21 | -0.205 |
| WS | 0.229 | -0.154 | 0.086 | -0.031 | -0.039 | -0.009 | 0.094 | 0.033 | 0.055 | -0.002 |
| WC1 | -0.246 | 0.133 | -0.028 | 0.046 | 0.007 | -0.062 | 0.008 | -0.005 | -0.033 | 0.02 |
| SSb | -0.242 | -0.102 | 0.123 | -0.043 | -0.036 | -0.027 | -0.008 | 0.012 | 0.039 | -0.048 |
| FLE | 0.036 | -0.069 | -0.174 | 0.186 | 0.214 | 0.144 | -0.128 | -0.002 | 0.078 | 0.266 |
| LC | 0.185 | 0.085 | -0.011 | -0.107 | -0.129 | 0.136 | -0.01 | -0.251 | -0.033 | -0.121 |
| LMC | 0.256 | 0.045 | -0.077 | 0.032 | 0.056 | 0.043 | 0.009 | -0.003 | -0.04 | 0.014 |
| VC | 0.185 | 0.001 | 0 | 0.052 | -0.178 | -0.062 | 0.038 | 0.035 | -0.118 | 0.146 |
| PC | -0.125 | -0.053 | 0.02 | -0.117 | -0.008 | 0.21 | 0.091 | -0.126 | 0.142 | -0.162 |
| PWC | -0.247 | 0.138 | -0.045 | 0.029 | -0.007 | -0.071 | 0 | 0.089 | -0.046 | 0.027 |
| HULSL | -0.205 | -0.109 | 0.069 | -0.108 | -0.057 | -0.046 | -0.018 | 0.002 | 0.063 | 0.04 |
| PL | 0.159 | -0.076 | 0.086 | -0.062 | 0.002 | 0.134 | -0.025 | -0.02 | 0.041 | -0.24 |
| LD | 0.154 | 0.129 | 0.005 | -0.001 | 0.021 | 0.043 | 0.171 | 0.023 | -0.068 | 0.092 |
| LC1 | -0.021 | 0.127 | -0.106 | 0.067 | -0.258 | 0.123 | -0.104 | 0.034 | -0.133 | -0.261 |
| LVC(us) | 0.078 | -0.175 | -0.085 | -0.092 | 0.04 | -0.289 | -0.254 | -0.122 | 0.077 | -0.03 |
| LVC(ls) | 0.049 | -0.127 | 0.048 | -0.033 | -0.051 | -0.332 | -0.299 | 0.019 | 0.104 | -0.008 |
| LMC1 | 0.057 | -0.084 | 0.079 | 0.112 | 0.064 | -0.078 | -0.252 | 0.185 | 0.098 | 0.007 |
| LS | 0.069 | 0.254 | -0.023 | 0.048 | -0.1 | -0.077 | -0.255 | 0.054 | -0.06 | 0.041 |
| DBL | -0.033 | 0.035 | -0.118 | -0.28 | 0.158 | -0.187 | 0.132 | -0.148 | 0.115 | 0.046 |
| PWPL | -0.055 | -0.055 | 0.077 | -0.099 | -0.162 | 0.214 | -0.148 | 0.215 | -0.025 | 0.011 |
| TC | 0.034 | -0.056 | 0.001 | -0.227 | -0.085 | 0.113 | 0.15 | -0.047 | -0.147 | 0.122 |
| PC1 | -0.166 | 0.031 | 0.035 | 0.004 | -0.175 | -0.075 | -0.056 | -0.214 | -0.138 | -0.04 |
| RT | 0.047 | 0.222 | -0.137 | 0.036 | -0.003 | -0.119 | -0.054 | 0.042 | 0.33 | -0.103 |
| APC | -0.052 | 0.022 | -0.19 | -0.258 | 0.132 | 0.107 | -0.095 | -0.192 | 0.025 | -0.14 |
| CS | 0.086 | 0.082 | 0.202 | -0.174 | -0.051 | -0.007 | 0.077 | 0.139 | 0.239 | -0.253 |
| SH | 0.03 | -0.019 | -0.191 | 0.126 | -0.178 | -0.002 | 0.189 | -0.049 | 0.237 | -0.113 |
| TTB | 0.004 | -0.258 | 0.074 | -0.093 | 0.123 | 0.242 | -0.159 | -0.064 | -0.186 | -0.151 |
| PTB | 0 | -0.048 | -0.011 | 0.216 | -0.214 | -0.063 | 0.347 | -0.023 | 0.278 | 0.036 |
| TS | 0.175 | -0.129 | 0.092 | 0.033 | -0.187 | 0.022 | 0.035 | 0.056 | 0.024 | -0.023 |
| RTS | 0.016 | 0.04 | 0.231 | -0.049 | 0.197 | -0.087 | -0.071 | -0.171 | -0.077 | -0.166 |
| PRT | -0.016 | 0.073 | 0.101 | 0.042 | 0.015 | 0.063 | 0.021 | -0.096 | -0.217 | 0.162 |
| APCTS | 0.034 | -0.061 | 0.111 | 0.289 | -0.093 | 0.226 | -0.052 | -0.041 | -0.089 | -0.107 |
| TST(mm) | -0.05 | -0.035 | -0.173 | -0.177 | 0.107 | 0.043 | 0.138 | 0.266 | -0.172 | 0.135 |
| TSC(bb) | -0.159 | 0.145 | 0.205 | 0.015 | 0.149 | 0.172 | -0.032 | 0 | 0.161 | -0.009 |
| HT | 0.018 | -0.109 | 0.013 | 0.317 | -0.071 | 0.03 | -0.001 | -0.328 | 0.16 | 0.018 |
| UFCCS | -0.094 | -0.063 | -0.01 | 0.288 | 0.032 | 0.013 | -0.018 | -0.104 | -0.168 | 0.176 |
| TF | 0.055 | 0.246 | 0.16 | -0.094 | 0.069 | -0.04 | 0.013 | -0.001 | -0.101 | 0.057 |
| FOC | -0.155 | -0.132 | 0.107 | 0.072 | -0.119 | 0.043 | 0.087 | 0.022 | 0.044 | 0.103 |
| SCHT | 0.026 | -0.002 | 0.022 | -0.03 | 0.163 | 0.062 | -0.115 | 0.01 | 0.224 | -0.072 |
| FCCTCS | 0.033 | -0.165 | -0.346 | 0.096 | 0 | 0.027 | -0.071 | 0.165 | -0.159 | -0.21 |
| FCLPT | 0.023 | -0.169 | -0.358 | 0.11 | -0.071 | -0.02 | 0.013 | 0.109 | -0.153 | -0.209 |
| DE | 0.069 | -0.132 | -0.187 | 0.04 | 0.306 | -0.003 | -0.003 | 0.001 | 0.16 | 0.146 |
| SL (cm) | 0.012 | 0.001 | -0.062 | -0.24 | -0.221 | 0.069 | -0.035 | -0.162 | 0.104 | 0.364 |
| SH (m) | -0.041 | 0.164 | -0.082 | -0.156 | 0.031 | 0.227 | 0.027 | 0.073 | 0.037 | -0.132 |
| IN | -0.065 | -0.168 | -0.063 | -0.094 | -0.03 | 0.106 | -0.047 | 0.347 | 0.107 | 0.077 |
| IL(cm) | -0.027 | 0.134 | -0.082 | 0.035 | 0.258 | 0.264 | 0.171 | 0.093 | -0.016 | 0.04 |
| NI | 0.109 | 0.03 | -0.082 | -0.133 | -0.279 | 0.102 | -0.077 | -0.163 | -0.077 | 0.113 |
| LW(cm) | 0.066 | 0.334 | -0.009 | 0.148 | -0.023 | 0.085 | -0.206 | 0.069 | -0.036 | 0.05 |
| LL(cm) | 0.159 | 0.145 | -0.041 | 0.003 | 0.01 | -0.096 | -0.249 | 0.05 | -0.059 | 0 |
| NTH | -0.033 | -0.299 | 0.169 | -0.009 | 0.166 | -0.028 | -0.027 | -0.006 | -0.191 | 0.044 |
| TL | 0.098 | -0.046 | 0.262 | 0.008 | -0.143 | 0.057 | 0.089 | 0.275 | -0.011 | 0.028 |
| TW | 0.091 | 0.004 | 0.219 | -0.059 | -0.034 | -0.217 | 0.033 | 0.23 | -0.054 | 0.125 |

Note: Values in bold indicate the most important traits (>0.25) that had large contributions to the total variance of a particular principal component.

internodes to first branching, an internode length of 11 cm to 13 cm, and a wing size of less than 1- 2 mm. The number of young leaves had high diversity ($H= 0.89$), whereas most accessions (54.3%) had 8 to 10 leaves at 30 days after emergence.

The leaf width of the mature stem also had high diversity ($H= 0.94$), where most of the accessions (57.1%) measure 10 cm to 14 cm wide. The fruit size also had high diversity ($H=0.61$) where most accessions (34.3%) had a measurement of greater than 3 cm. Likewise, the number of tubers per hill and width had high diversity ($H= 0.73$, and 0.99 , respectively). Most accessions (61.4%) had a few tubers per hill and a width of 10 cm wide and below.

The mean H' of the qualitative and quantitative traits was high ($H= 0.62$ and $H=0.86$, respectively). All the quantitative traits had high and very high morphological diversity. This means that diverse yam accessions still exist on Tablas Island, comparable to the study of Ngompe-Deffo et al. (2017) with a diversity index ($H'= 0.61$) for cultivated cowpea. And incongruence to the statement of Beyene (2013) that the higher the diversity index, the more diversity among germplasm.

Wide variation was observed in various qualitative characters used in the morphological characterization of yam accessions, such as stem color, the vigor of the mature stem, stem color, wing color, spines on the stem base, leaf color, leaf margin color, vein color, petiole color, petiole wing color, the position of leaves, leaf density, leaf vein color (upper surface), leaf shape, fruit formation, fruit development, hairiness, surface texture, aerial tuber shape, flesh color, skin color, the relationship of tubers, tendency of tuber to branch, tuber shape, roots on the tuber surface, tuberkin color, hardness of tuber, uniformity of flesh color in cross-section, the texture of flesh, flesh oxidation, skin color at the head of the tuber, flesh color at the central transverse section, flesh color at the lower part of a tuber and tuber skin thickness. Similar observations were reported in the studies by Anokye et al. (2014); Demuyakor et al. (2013); Islam et al. (2012); Bressan et al. (2011). As Velayudhan et al. (1989) mentioned, continued selection within germplasm has contributed to a variation on the species.

Correlation and Principal Component Analysis

Correlation analysis was critical in determining the interrelationship of the traits that are essential in designing a breeding strategy. In the PCA, eigenvalues and load coefficient values were generated from the data set. The PCs with eigenvalues > 0.7 were selected, and those traits with load coefficient values > 0.25 were considered as relevant scores for the PC, significantly contributing to distinguishing between the genotypes (Jeffers, 1967).

The principal component scores (PC1 – PC10) are the eigenvectors (latent vectors) for each of the 62 morphological traits (Table 4). The multivariate analysis based on the 62 morphological traits revealed great diversity among the 70 accessions of *Dioscorea* spp.

Each of the first 10 PCs had an eigenvalue greater than 1.0 and explained 61.4% of the total variance in the data set (Table 4). Scores of PC1, which accounted for 0.83% of the total variation, were correlated ($r > 0.25$) with traits related to the stem (absence or presence of spines and leaf margin color).

Scores of PC2, which explained 7.60% of the total variation, were correlated ($r > 0.25$) with related to leaves and underground tubers, such as leaf shape, leaf width, the tendency of tubers to branch, and the number of tubers per hill.

Table 4. Eigenvalues, percentage variation, and accumulated variation explained by each component of the first 10 principal components

| Principal Component | Eigen-values* | Each Component | Accumulated Variation (%) |
|---------------------|---------------|----------------|---------------------------|
| 1 | 12.912 | 20.83 | 20.83 |
| 2 | 4.711 | 7.6 | 28.43 |
| 3 | 3.764 | 6.07 | 34.5 |
| 4 | 2.906 | 4.69 | 39.19 |
| 5 | 2.66 | 4.29 | 43.48 |
| 6 | 2.525 | 4.07 | 47.55 |
| 7 | 2.386 | 3.85 | 51.4 |
| 8 | 2.193 | 3.54 | 54.94 |
| 9 | 2.039 | 3.29 | 58.23 |
| 10 | 1.966 | 3.17 | 61.4 |

The scores of PC3, which explained 6.07% of the total variation, were correlated ($r>0.26$) with underground tubers, such as flesh color at the central transverse cross-section, flesh color at the lower part of the tuber, and tuber length. The scores of PC4, which explained .69% of the variation, were mainly correlated ($r>0.25$) with leaves (distance between lobes) and underground tuber traits such as the absence or presence of corm, absence or presence of cracks on the tuber surface, hardness of tubers, and the uniformity of flesh color in the cross-section. The scores of PC5, which explained 0.29% of the total variation, were correlated ($r>0.25$) with leaf color, days to emergence, internode length, and the number of internodes. The scores of PC6, which explained 4.07% of the total variation, were correlated ($r>0.25$) with the vigor of mature stem and traits of leaves such as leaf vein color of the upper and lower surface.

The scores of PC7, which explained 3.85% of the total variation, were correlated ($r>0.25$) with days to emergence, leaf apex shape, leaf shape, petiole, and petiole wing color. The scores of PC8, which explained 3.54% of the total variation, were correlated ($r>0.25$) with leaf color, tuber skin thickness, hardness of tubers, internode number, and tuber length. The scores of PC9, which explained 2.29% of the total variation, were correlated ($r>0.27$) with underground tubers (the place where tuber branches and the relationship of tubers). The scores of PC10, which explained 3.17% of the total variation, were correlated ($r>0.25$) with first leaf emergence, leaf color, corm size, and stem length.

The study revealed positive correlations between first leaf emergence, leaf margin color, leaf shape, absence/presence of crack on tuber surface, hardness of tubers, uniformity of flesh color in cross-section, tuber skin thickness, days to emergence, internode length, internode number, stem length, number of leaves, number of tubers per hill and tuber length. Some of the traits, such as the number of days to emergence, number of tubers per hill, and tuber length, were considered in the selection for better yield in *Dioscorea* spp.

The first ten principal components explained 61.4% of the total variation in the number of clusters. This means there was a high level of diversity on the existing yam on the island, which was confirmed by principal component analysis.

CONCLUSION

Variations in the morphological characters of *Dioscorea* species exist in Tablas Island indicating species diversity and possible endemism. Also, the diversity index on both qualitative and quantitative traits among yam (*Dioscorea* spp) accession in Tablas Island are relatively higher. Additionally, the results of PCA have shown that several traits have considerably contributed to the variation within and between yam accessions.

AUTHOR'S CONTRIBUTIONS

The author confirms sole responsibility for the whole manuscript and study.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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A Proposed Model on Disaster Risk Reduction Management for Basic Education Schools

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ABSTRACT

This study determined and described the status of the emergency preparedness and response system of basic education schools in Romblon, Philippines. Using descriptive evaluative and development research design, validated questionnaires were used as a data gathering technique supplemented with interviews from public elementary and high school principals and teachers, and barangay officials from areas prone to disasters in the islands of Sibuyan, Romblon, Tablas and Carabao in the province of Romblon. Frequency, percentage, mean, and one-way ANOVA were used for data analysis. Results showed that schools moderately practiced the identified five emergency preparedness and response system components, which calls for improving and strengthening the disaster risk reduction management programs and activities. Findings were used as a basis for the development of a Proposed Model of Disaster Risk Reduction Management for Basic Education schools.

Keywords: *basic education, disaster risk reduction management model, program assessment.*

INTRODUCTION

Philippines is one of the disaster-prone countries, frequently hit by calamities/disasters due to its geographical location. The province of Romblon, considered the heart of the Philippine archipelago, is also susceptible to these disasters. That is why Schools Division of Romblon should undergo evaluation for its preparedness for emergencies, considering that school children are considered the most vulnerable during disasters and calamities.

Department of Education (DepEd) Order 55 s. 2007, known as Prioritizing the Mainstreaming of Disaster Risk Reduction Management in the School System and Implementing Related Programs and Projects, emphasizes building disaster-resilient schools, nations, and communities. This is also one of the goals of the Hyogo Framework for Action 2005 – 2015, which is a priority policy for the department to pursue. Its focus is to have school programs that are secure and invulnerable to disaster. To ensure that DepEd orders are properly implemented at the lower level, evaluation of the general implementation of the status of basic

education schools' emergency preparedness and response system is vital.

In consonance with the Republic Act No. 10121, known as the Disaster Risk Reduction and Management Act of 2010, the Disaster Risk Reduction and Management Office recommends policy measures, and propose programs and projects that will mitigate the impact of disasters on DepEd teaching, non-teaching personnel and staff, learners, and properties (Fig. 1).

Prioritization of DRRM programs is supported by various legal issuances to wit: Executive Order 888 Disaster Risk Reduction (DRR); RA 10121 – Philippine Disaster Risk Reduction Mgt. Act 2010 (PDRRM); National Disaster Coordinating Council (NDCC); PD No. 1566 S. 1978 – Philippine Disaster Control, Capability and Establishing National Program on Community Disaster Preparedness; Dep. Ed. Order No. 50 S. 2011, Creation of Disaster Risk Reduction and Management Office (DRRMO); Dep. Ed. Order No. 55 S. 2007, Prioritizing the Mainstreaming of Disaster Risk Reduction Management in the School System and Implementation of Programs and Projects and Relative Therefore; Dep. Ed. Order No. 43 S. 2012- Guidelines on the Implementation of Executive Order No. 66 (Prescribing Rules in the Cancellation or Suspension of Classes & Work in the Government Offices Due to Typhoons, Flooding, other Weather Disturbances & Calamities; and Dep. Ed. Order No.48 S. 2012 – Quarterly Conduct of the National School-Based Earthquake and Fire Drills.

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Objectives

This study aimed to develop a disaster risk reduction management system model for basic education schools in the province of Romblon. Specifically, it attempted to determine the status of disaster risk reduction management of the school as perceived by school managers, teachers, and barangay officials during calamities/disasters in terms of the following components: team organization and leadership capabilities with the following teams: building safety inspection; early warning; fire safety; supply; search and rescue; evacuation; first aid; communication; site security; relief and damage control; transportation; coordinating; financial and material capabilities; response mechanism; preparedness skills and abilities; reporting system/management.

Likewise, the study further aimed to identify the strengths and weaknesses of the disaster risk reduction management system of the basic education schools as perceived by the groups of respondents during calamities/disaster in terms of the aforementioned components and determine the significant differences in the perceptions between and among the groups of respondents on the disaster risk reduction management system during disasters and calamities. Finally, the study aimed to develop a Disaster Risk Reduction Management Model (DRRMM) designed for Basic Education Schools.

METHODOLOGY

Descriptive evaluative and development design was used in this study to determine and describe the

situation as it existed at the time of the study. The baseline data was the basis for creating a Proposed Model Framework on Disaster Risk Reduction Management DRRM for Basic Education Schools and the extension program of Romblon State University-Sta. Maria Campus. This is an intervention in coping with the gaps in the emergency preparedness and response system of the basic education schools in the province of Romblon and of the whole community as well.

The respondents were public elementary and secondary school principals, teachers, and barangay officials from the islands of Sibuyan, Romblon, Tablas Island, and Carabao Island in the province of Romblon Philippines, which are identified as areas prone to different forms of disasters (Table 1).

Before the distribution of validated questionnaires to the respondents, the provincial governor endorsed the researchers to the different heads of public, private and civil agencies throughout the province for the conduct of the study. Permission was also given by the Schools Division Superintendent.

Interviews were also conducted with selected school personnel and barangay officials to supplement the data gathered. During the interview, teacher-respondents commented that the most common problem of the school is the lack of a committee on safety and rescue operations as well as the emergency vehicles to be used during emergencies. The claim is mostly the same, especially in schools in remote areas except in the province proper Romblon Island since they have enough patrol cars, ambulances, and even private vehicles ready to be used in an emergency. On contrary, the claim of one of the municipal mayors of Sibuyan Island when their market and nearby houses were burned by fire and

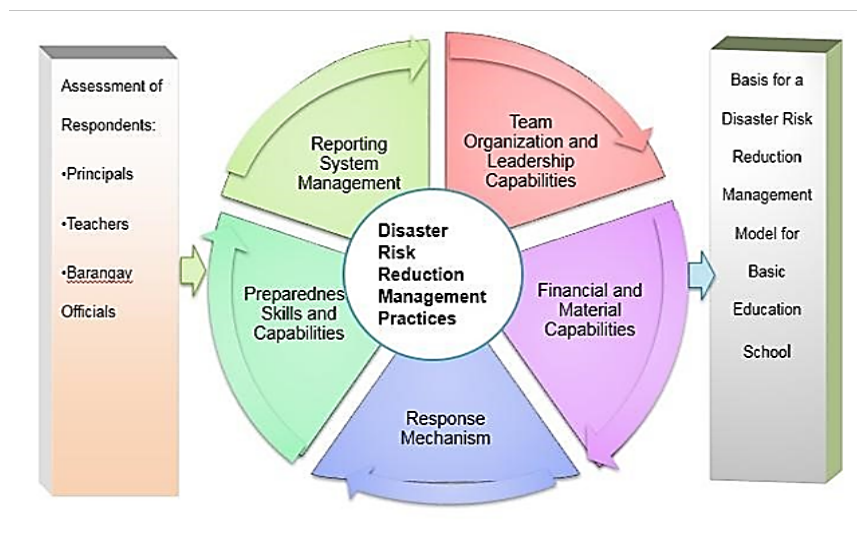


Figure 1. Conceptual Framework of the Study

brought millions of damages/casualties because they didn't even have a firetruck to be used for emergency cases, the same happened in Looc, Romblon, while Bonga Elementary School in Sta. Maria, Romblon was also damaged because of fire, and this was due to faulty wirings.

It was seen and observed in the study that some of the participating schools were flooded for a week, and school children were still playing in the school ground submerged with water. Landslides were also observed, and when interviewed, some of the residents of Sibuyan Island commented that it was due to mining. Statistical tools such as frequency, percentage, mean, and one-way ANOVA were applied in interpreting and analyzing the study results. The Regional Director, Office of the Civil Defense MIMAROPA and the PDRRMO Romblon validated the proposed model.

RESULTS AND DISCUSSION

As shown in Table 2, the participating barangays and the basic education schools moderately practiced the

five components of the emergency preparedness and response system of the basic education schools: Team Organization and Leadership Capabilities, Financial and Material Capabilities, Response Mechanism, Preparedness Skills and Abilities, and Reporting System Management.

The school's team organization and leadership capabilities were found to have been moderately practiced almost of the indicators on the respective teams except for the supply team and search and rescue team which were found fairly practiced in most of the indicators hereof. Among the teams, the principal as the coordinating team was ranked second from the highest and interpreted as moderately practiced which means participants' assessment was arbitrary when it comes to strengths and weaknesses, the principals were perceived to be strong in handling such functions. The overall implication found its weaknesses and needs to be improved in ensuring the capabilities of leaders and members of the different teams.

The financial and material capabilities of the schools were perceived by teachers, parents and

Table 1. Distribution of the Respondents by School

| Island | Name of School | Principals / Head Teachers | Teachers | Barangay Officials | Frequency | Percentage |
|-------------------|------------------------|-------------------------------|------------|-----------------------|------------|-------------|
| | | N | n | n | | |
| Carabao Island | San Jose ES | 1 | 10 | 0 | 11 | 3.48% |
| Tablas Island | Alcantara CES | 1 | 10 | 4 | 15 | 4.75% |
| | Alcantara NHS | 1 | 10 | 2 | 13 | 4.11% |
| | Bonga ES | 1 | 7 | 2 | 10 | 3.16% |
| | Calagonsao ES | 1 | 10 | 2 | 13 | 4.11% |
| | Carmen NHS | 1 | 4 | 0 | 5 | 1.58% |
| | Concepcion Norte ES | 1 | 10 | 4 | 15 | 4.75% |
| | Esteban Madrona ES | 1 | 9 | 0 | 10 | 3.16% |
| | Esteban Madrona NHS | 1 | 9 | 2 | 13 | 4.11% |
| | Libertad NHS | 1 | 10 | 0 | 11 | 3.48% |
| | Looc CES | 1 | 10 | 2 | 13 | 4.11% |
| | Looc NHS | 1 | 7 | 4 | 12 | 3.80% |
| | Odiongan South CES | 1 | 10 | 4 | 15 | 4.75% |
| | Panique ES | 1 | 10 | 0 | 11 | 3.48% |
| | Romblon NHS (Odiongan) | 0 | 0 | 2 | 2 | 0.63% |
| | San Agustin CES | 1 | 10 | 0 | 11 | 3.48% |
| | San Andres CES | 1 | 10 | 0 | 11 | 3.48% |
| San Andres NHS | 1 | 10 | 2 | 13 | 4.11% | |
| Sta. Fe ES | 1 | 10 | 0 | 11 | 3.48% | |
| Sto. Niño ES | 1 | 2 | 0 | 3 | 0.95% | |
| Romblon Island | Romblon West CES | 1 | 20 | 4 | 25 | 7.91% |
| | Romblon NHS (Romblon) | 2 | 17 | 2 | 21 | 6.65% |
| Sibuyan Island | Cajidiocan ES | 1 | 10 | 2 | 13 | 4.11% |
| | Cambijang ES | 1 | 10 | 0 | 11 | 3.48% |
| | Magdiwang ES | 1 | 10 | 2 | 13 | 4.11% |
| | Magdiwang NHS | 1 | 10 | 4 | 15 | 4.75% |
| TOTAL | | 26 | 245 | 44 | 316 | 100% |

barangay officials as moderately to fairly practice. This perception was because the school head was not directly in-charge of conducting relief operations instead assists only concerned agencies. To prepare the school for possible expenses, the Head may generate funds to supplement the budget for emergency cases. He/she can establish linkages and may ask for assistance from the 5% calamity fund of the Local Government Unit (LGU).

As to the school's response mechanisms, it was observed moderately practiced. This shows that the principals, teachers and parents/barangay officials perceived that the school principal is satisfactorily participating in terms of emergency and disaster by providing and installing an alarm system, informing all personnel and students on what to do upon hearing signals such as sirens, bell, megaphone or whistles, updates teachers, students and other personnel on the latest warning media, identifies and introduces an evacuation plan, posts the evacuation map in every classroom and ensures the minimum standards of evacuation centers/areas by taking into consideration the space for each family.

On the other hand, the respondents perceived some indicators as Fairly Practiced. It was noted significantly that the component of the response mechanism interviews has impacted their observations in the real situations of the schools in the division of Romblon. Hence, a collaborative effort of school heads and other stakeholders plays a significant role in responding to emergencies.

At this point, the schools in Romblon lack this particular equipment because of the big gaps observed in ensuring the preparedness for possible impacts of worse-case disasters in the province. At this juncture, the need to call the attention of the concerned higher officials or agencies in providing the needed equipment and supplies to different institutions, particularly the schools for their preparedness, is one of the major roles and responsibilities of school principals and local executives in managing their respective units.

On preparedness skills and abilities, the respondents perceived the indicators as Moderately Practiced except for one of the indicators "the school principal conducts training for safety like fire and earthquake drills regularly," was perceived and rated the highest by the respondents. This indicates that the elementary and high school principals can conduct lectures about different hazards such as typhoons, floods, fire, landslide and earthquake on what to prepare in case any of these disasters strike the school. Moreover, some responses from interviews of the school principals are indicative of the data obtained as follows:

Our school organizes School Disaster Risk Reduction Management Committee (SDRRMC) to ensure safety. On the other hand, the teachers, parents, students and nearby residents are informed about preparations for emergencies arising during Parents Teachers Association (PTA) meetings.

Table 3. F-Test Values on Significant Differences on the Perceptions among the Respondents on the Disaster Risk Reduction Management System of Basic Education Schools

| Components | Source of Variation | Sum of Squares | df | Mean Square | F | Sig. (p-value) | Interpretation |
|--|---------------------|----------------|----|-------------|--------|----------------|----------------|
| Organization and Leadership Capabilities | Between Groups | 11.01 | 2 | 5.51 | 90.85 | 0.00 | Significant |
| | Within Groups | 17.15 | 28 | .06 | | | |
| | Total | 28.16 | 28 | | | | |
| Financial and Material Capabilities | Between Groups | 12.56 | 2 | 6.28 | 103.66 | 0.00 | Significant |
| | Within Groups | 17.15 | 28 | .06 | | | |
| | Total | 29.71 | 28 | | | | |
| Response Mechanism | Between Groups | 13.99 | 2 | 7.00 | 115.50 | 0.00 | Significant |
| | Within Groups | 17.15 | 28 | .06 | | | |
| | Total | 31.15 | 28 | | | | |
| Preparedness Skills and Abilities | Between Groups | 11.55 | 2 | 5.77 | 95.26 | 0.00 | Significant |
| | Within Groups | 17.15 | 28 | .06 | | | |
| | Total | 28.70 | 28 | | | | |
| Reporting System Management | Between Groups | 23.98 | 2 | 11.99 | 197.81 | 0.00 | Significant |
| | Within Groups | 17.15 | 28 | .06 | | | |
| | Total | 41.13 | 28 | | | | |
| TOTAL | Between Groups | 13.45 | 2 | 6.73 | 110.98 | 0.00 | Significant |
| | Within Groups | 17.15 | 28 | .06 | | | |
| | Total | 30.60 | 28 | | | | |

Table 4. Post Hoc Test on Significant Differences on the Perceptions between and Among the Respondents on the School Disaster Risk Reduction Management System

| Key Areas | Principals VS Teachers | Difference | Principals VS Parents/Brgy. Officials | Difference | Teachers VS Parents/Brgy. Officials | Difference |
|--|------------------------------|-----------------|--|-------------|--|-------------|
| Organization & Leadership Capabilities | -0.01 | Not Significant | 0.16 | Significant | 0.15 | Significant |
| Financial & Material Capabilities | -0.09 | Not Significant | 0.07 | Significant | 0.16 | Significant |
| Response Mechanism | 0.07 | Not Significant | 0.13 | Significant | 0.20 | Significant |
| Preparedness Skills & Abilities | 0.15 | Significant | 0.05 | Significant | 0.15 | Significant |
| Reporting System Management | 0.61 | Significant | 0.78 | Significant | 0.11 | Significant |

G1 = Principals, G2 = Teachers, G3 = Parents/Barangay Officials

HSD Value: a = .15 , b = 0.05, c = 0.15

Nevertheless, most schools, especially in remote areas, have not organized School Disaster Risk Reduction Management Committee (SDRRMC) since only a few teachers were assigned to their schools when interviewed during the study, but still followed DepEd Memo by conducting earthquake drill.

Based on the DepEd Manual on Disaster Risk Reduction, every school should train and maintain a pool of trainers on Disaster Risk Reduction. The school head should initiate capability training, programs and projects to improve the skills and capabilities of teaching and non-teaching personnel. Likewise, the school must have a Database Management Team, which shall take in charged by a Programmer as the head, assisted by five (5) encoders. The main function of the database management team is to collect, validate and analyze the data based on emergencies and/or calamities. Its qualitative and quantitative impact will be presented to the education sector.

Strengthening the preparedness on disaster risk reduction at all levels of education is very vital. After evaluating and analyzing the result of the conduct of earthquake, fire and/or flood drills, these will be presented and submitted to the authorities for improvement and enhancement, to ensure preparedness for emergencies.

Being prepared tips from the Department of Science and Technology (DOST) PHIVOLCS, was adopted. School Disaster Risk Reduction Management Council (SDRRMC) should have a yearly update on the information of school population, prepare the most recent school map, and prepare the building floor plan of each building. Conduct watching exercises by

observing safe and unsafe zones, suggest corrections for improvements, assess the structural integrity of building/s with the assistance of an engineer, and assess if the school location is tsunami or flood-prone.

Good practices and safe zones must be observed. Swing outdoors, wide corridors, and wide-open spaces for evacuation, fire exits, and public alarm system. Some of the unsafe zones: windows and glass panes, bookshelves, machinery, cabinets, and furniture that may topple or slide narrow alleys.

The last component on emergency preparedness and response system assessed was reporting system management, rated as moderately practiced by the school officials. Big gaps show that in this component school heads missed to implement this function to a very high extent, thus, there is a need to improve this component. It should create website for repository and retrieval of data on disasters/calamities that will be used for information dissemination, policy formulation, resource allocation and decision-making: 1) assist the programmer in processing disaster related data; 2) assist the preparation of office orders, memoranda, communications and power point presentations; and 3) assist in preparations of reports, checks, classifies official communications and maintains files of disaster related data.

Although there are strengths in School's Emergency Preparedness and Response System to emergencies, still they need to improve and strengthen their programs and activities in ensuring prevention and mitigation of disasters. The findings suggest the attention of higher Dep. Ed. officials in ensuring the safety of school personnel, students, enhance the level

of awareness, the capacity of the community to mitigate threats and minimize impacts of all forms of hazards.

Based on the findings the researchers developed a proposed model framework for emergency preparedness and response system of the basic education schools. It incorporated the findings and observations of the study as well as the insights gained from interview with the respondents. The participants perceptions on the five key areas/components and their indicators were mainly considered in deriving at the model framework and give emphasis on the additional components which is the monitoring and evaluation, recovery and rehabilitation to prevent and mitigate the prolonged agony of victims to disasters. This proposed model framework is in response to the Department of Education Disaster Risk Reduction Management Vision: Its purpose is to deliver effective and efficient disaster program and assistance in a culture of safe and disaster risk resilient members of the school communities who are empowered and accountable citizens in an atmosphere of collaboration and synergy with a response mechanism through synchronize and concerted effort. The model was based also on various Disaster Risk reduction Management (DRRM) mandates/ thrusts through the following issuances: Executive 888 Disaster Risk Reduction (DRR), RA 10121 – Philippine Disaster Risk Reduction Mgt. Act 2010 (PDRRM), National Disaster Coordinating Council (NDCC), Dep. Ed. Order No. 555 2007 Philippine Disaster Management System (PDMS), PD No. 1566 s. 1978 – Disaster Control, Capability, and the Establishment of a National Community Disaster Preparedness Program in the Philippines.

Basic Education Schools in Romblon, different departments, international and national organization both government and non-governmental organizations acted collaboratively just to mitigate the vulnerability brought by the natural and human induced disasters/calamities. UNICEF, National Disaster Risk Reduction and Management Council (NDRRMC) under the National Defense Office, Department of Science and Technology-PHIVOLCS, PAG-ASA, MGB, and Philippine National Red Cross in cooperation with the Dep. Ed. made safety measures through information dissemination by making journals fliers concerning earthquake safety in schools- a primer for teachers (2008), how to conduct an earthquake drill in school (2005), Pag alerto, Malayo sa Peligro, what to do during an earthquake, PHILVOCS (2010), a Primer on Storm Surge PAG ASA (2009), Iba ang Ready sa Paguho MGB (2007) Earthquake Preparedness Guide of Marikenyo (2000) help Filipinos to be prepared save lives, and properties, and help decrease the number of casualties from the different disasters.

As stipulated in an Earthquake safety in schools a primer for teachers (2008) one can observe safety

measures to avoid the impacts of an earthquake by familiarizing themselves and teaching students about school surroundings.

In the framework, the components of the School Emergency Preparedness and Response System include: before the disaster – prevention and mitigation, during the disaster – emergency response mechanism, and after the disaster – reporting system/management, monitoring / evaluation and recovery / rehabilitation.

Under prevention and mitigation, the leadership capabilities of the school are important. The principal may assign a coordinating team to chair the School Disaster Risk Reduction Management Committee.

To determine further which among the pairs of respondents were significantly different, the Honestly Significant Difference (HSD) or Turkey Method was computed to be statistically significant, any obtained mean difference must be the same or higher than the HSD values. (Punzalan and Uriarte, 2000).

As shown in the Table above, in the first, second and third components, the principals and teachers' perceptions were found not significantly different from each other with mean differences of -.01, -.09, and .07 which were lower than the HSD values of 0.15, 0.05, and 0.15 respectively. However, the perceptions between principals and parents/barangay officials were found significantly different in all the five (5) key areas with mean difference ranging from 0.05 – 0.78 which were found equal to or higher than the HSD values of 0.15, 0.05, and 0.15 respectively.

Both the principals and teachers perceived that the school has organized programs for emergency preparations, has sources for financial needs and material capabilities, and somehow has been doing response mechanism in times of emergency.

On the other hand, principals, teachers, parents and barangay officials do not have the same perceptions with regards to organization and leadership capabilities of the school, its financial and material capabilities, response mechanism, preparedness skills and abilities and reporting system management. The teachers believed that the objective of the school in organizing School Disaster Risk Reduction Management Committee (SDRRMC) is to prepare the school for emergency. This consists of different committees, and each committee is headed by a team leader who was chosen on the bases of preference, skills, experience and background.

However, the parents and some barangay officials have seen some problems in the operation of disaster management, such as lack of rooms for evaluation, and comfort rooms where victims of calamity can be sheltered. Besides, the school is located along the road; there is a danger for young children evacuees to meet an accident if there's no Barangay Tanod to take charge of the traffic.

With regards to availability of disaster equipment in school, the parents/barangay officials observed that there is a limited fire extinguisher, fire hydrant, and no available fire track in case of emergency. To add on these observations, some barangay captains noticed that in some elementary and high schools, the facilities are present, only, there is lack of leaflets used for information dissemination, and the resource persons who handle the training and drills have limited knowledge on waste management and calamity awareness. Hence, they found that in some schools, the most common problems in disaster management are facilities, equipment and financial support.

Management nature depends on local economic and social conditions. Some disaster relief experts like Fred Cuny (1994) have long noted that the cycle of Emergency Management must be a long-term work on infrastructure, public awareness, and even human justice. Cuny said that the process of Emergency Management involves four phases: mitigation; preparedness; response; and recovery.

Therefore, if these phases were not well understood by the schools' stakeholders, such as principals, teachers and parents, it will result to disagreement of beliefs, ideas and reactions.

In view of the findings, Total Quality Assurance (TQA) was not attained in all areas, there is a need to develop a framework on Disaster Risk Reduction Management for Basic Education Schools in Romblon.

This study presents the proposed Disaster Risk Reduction Management Model (DRRMM) for Basic Education schools. It incorporated the findings and observations of the study as well as the insights gained from interviews with the respondents. The participants' perceptions of the five key areas/components and their indicators were mainly considered in deriving at the model framework. Other sources, such as the DepEd Disaster Risk Reduction Management Manual, were also considered. Management nature depends on local economic and social conditions. Some disaster relief experts like Fred Cuny (2009) have long noted that the cycle of Emergency Management must be a long-term work on infrastructure, public awareness, and even human justice. Cuny said Emergency Management involves four phases: mitigation; preparedness; response; and recovery.

Therefore, if these phases were not well understood by the schools' stakeholders, such as principals, teachers and parents, it would result in disagreement of beliefs, ideas and reactions.

Given the findings, Total Quality Assurance (TQA) was only attained in some areas, there is a need to develop a framework on Disaster Risk Reduction Management for Basic Education Schools in Romblon.

CONCLUSION

Basic Education schools in Romblon, Philippines have been implementing emergency preparedness and response system programs/activities in addressing disaster preparedness. However, their implementation did not reach the intent status in attaining total quality assurance. It was perceived and practiced only in a moderate scheme, and the gap shows its weakness and a need to improve them. Basic Education schools need more materials and supplies in preparation for and during emergencies. The proposed model framework for the emergency preparedness and response system of basic education schools (Figure 2) as an output of the study served as the basis for an extension program of Romblon State University Sta. Maria Campus where important information will be disseminated to the community and to the Department of Education Division of Romblon to make them aware of their emergency preparedness status and response system. The proposed model was validated and improved based on the suggestions and recommendations of the Regional Director, Office of the Civil Defense (OCD) MIMAROPA and the Provincial Disaster Risk Reduction Management Officer (PDRRMO) Romblon.

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AUTHORS' CONTRIBUTIONS

The authors confirm the authors' equal contribution to the paper.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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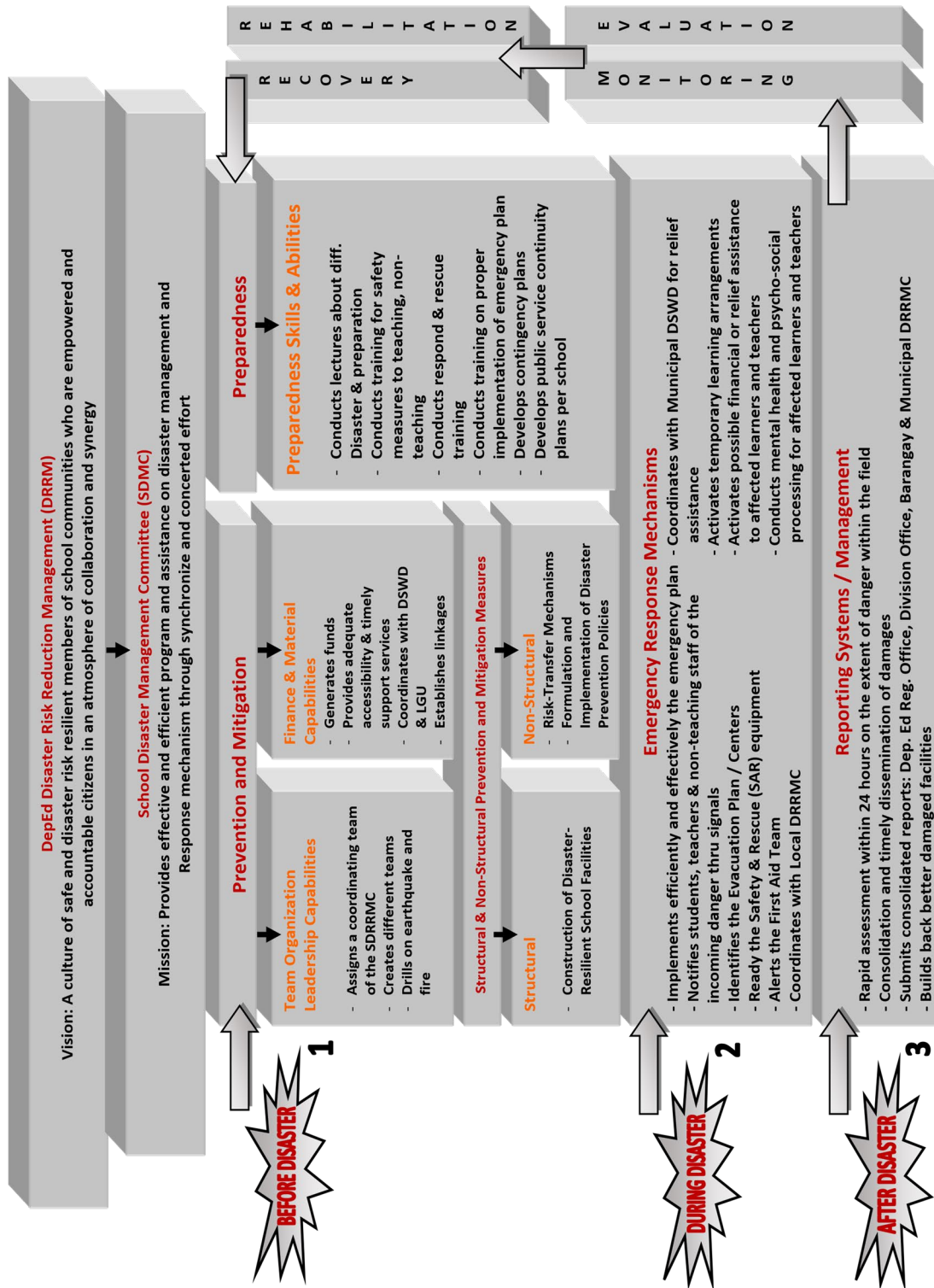


Figure 2. Proposed Model Framework on Disaster Risk Reduction Management of Basic Education Schools in Romblon

Freshmen College Students' Perception of Effectiveness of JC Snakes and Ladders Game in Improving Mathematical Ability

Judy Ann C. Luna, Crystal Jeane M. Roda, Cris Anthony R. Rabino, Clara Jean M. Juanzo and Gerardo R. Ribon

ABSTRACT

The game "JC Snakes and Ladders" was developed to improve mathematical ability. It was pilot tested among freshmen college students of Romblon State University Cajidiocan Campus. This paper presents the evaluation results of the developed game in terms of motivation such as attention, relevance and reliability; user experience such as satisfaction, immersion, challenge, social interaction and fun; and knowledge. Results showed that JC Snakes and Ladders is perceived to be effective in raising students' motivation, experience, and knowledge. Utilization of the intervention is recommended.

Keywords: *JC snakes and ladders game, Mathematics in the Modern World, Learning Gains, Immersion, Challenge, Satisfaction.*

INTRODUCTION

Mathematics in the Modern World is described as a course on the nature of Mathematics, including appreciation of its practical, intellectual, and aesthetic dimensions, and application of Mathematical tools in daily life. It allows the students to look beyond the common perception of Mathematics as nothing more than a collection of formulas but of beauty through natural patterns and potent language ruled by logic and reason (CHED, 2013).

Mathematics is fundamental in day-to-day living. It serves as the bedrock of man's daily existence. Mathematics is everywhere, as it is said. People deal with Mathematics every time they wake up, look at the clock, or walk. Mathematics teaches reasoning power, creativity, problem-solving ability, abstract or spatial thinking, and practical communication skills. When asked about mathematics, many people said it is difficult and tedious because it always deals with numbers, shapes, and problems they do not care about. As a result, it is difficult for teachers to pique their students' interests. That is why teachers are constantly looking for new strategies, approaches, and techniques to assist students in improving their Mathematics performance.

Teachers are using intervention to ensure that all students succeed in dealing with today's challenges. When assisting students with difficulty in Mathematics, the teacher must select an appropriate time and strategy. The foundation of Mathematics in the Modern World reveals that the course addresses the stigma through interactive and facilitative encounters that emphasize its practical application. These interactions are influenced by the teacher's skills as well as students' characteristics and difficulties.

In the classroom, games can be a valuable tool for math. It also allows students to expand their knowledge and reasoning abilities. Thus, teachers should give students multiple opportunities to play and enjoy the game, then allow students to emerge with new patterns, relationships, and strategies as a result of their experiences (Osman & Bakar, 2012). Enjoyable and motivating games appeal to people of all ages, and students can learn about basic number concepts such as sequence counting, one-to-one correspondence, and computation strategies.

The new normal situation is challenging for students, especially in Mathematics. Learners' usual activities, such as face-to-face interaction, have been replaced by modular learning, online learning, and blended learning; all of which impact on each student's learning style and competencies. Thus, the researchers came up with a game-based learning solution to help students improve their math skills.

To attain the course's goals, the researchers developed "JC Snakes and Ladders," a game that

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summarizes the competencies discussed in the course Mathematics in the Modern World, to improve students' mathematics abilities, aid students' learning, emphasize real-world applications, and promote good study habits. Because this team game requires critical thinking to win, it addresses students' mental and social aspects and the stigma associated with mathematics.

METHODOLOGY

Research Design

The cross-sectional survey design was used in this study to evaluate the developed "JC Snakes and Ladders" game. In a cross-sectional study, the investigator measures the outcome and the exposures in the study participants at the same time. This approach was primarily used to assess present attitudes, beliefs, and behaviors (Creswell, 2012).

The Samples

All officially enrolled first-year students ($n=60$) of Romblon State University – Cajidiocan Campus during the second semester of the school year 2020-2021 provided relevant data and information for this study. Majority of the respondents were female (80%), while 20% were male. The participants were from the BTLEd program ($n=15$), BEEd program ($n=10$) and the rest were from BSEd Math, English and Science ($n=35$).

The Intervention

The "JC Snakes and Ladders" game is named after its creators, Judy Ann and Crystal Jeane, and is divided into three difficulty levels: easy, average, and difficult. The easy level focuses on number series and sequences, the average level focuses on variables, and the difficult level focuses on logical operations. The game was designed using the syllabus for the course Mathematics in the Modern World.

The game is played using a "JC Snakes and Ladders" board, cards, paper, and pen. Players are divided into groups of three and each group selects a representative to play against another group. The game begins when each player simultaneously chooses a card to determine their turn order. The number on the card is the number of spaces a player moves on the board. If a player lands on a tile with a question, they must answer it and write it down on the provided paper. If a player's card lands on top of a snake, they slide down to the bottom of the snake. If a player's card lands at the base of a ladder, they immediately climb to the top. The first player to reach the finish line is declared the winner.

Data Gathering

The researchers obtained approval from the campus director before conducting their study. After obtaining consent, they approached the target

respondents and sought their participation. All respondents were invited to participate in a board game session in a classroom setting, where the game's rules were explained to them. The session lasted 20-30 minutes, followed by completion of an evaluation form. Participation in the survey was based on the respondents' voluntary consent, respecting ethical considerations.

The study utilized a survey questionnaire divided into the demographic profile and evaluation of the board game. Part one asked for the respondent's profile information, such as age, sex, and course. The second part consisted of questions for the evaluation of the board game, adapted from the instrument created by Savi, Wangenheim, Ulbricht, and Vanzin (2010) and was presented on a Likert scale ranging from 1 to 5, with 1 representing "strongly disagree" and 5 representing "strongly agree."

Data Analysis

Mean was used in analyzing the students' evaluation of the "JC Snakes and Ladders Game." Descriptive interpretation and level of each of the respective scales are detailed below.

RESULTS AND DISCUSSION

The evaluation results of the respondents on the developed "JC Snakes and Ladders" in terms of attention, relevance, reliability, satisfaction, immersion, challenge, social interaction, fun, and knowledge are shown in Table 1.

Table 1. Evaluation of the respondents in terms of attention, relevance, reliability, satisfaction, immersion, challenge, social interaction, fun, and knowledge.

| Parameters | Mean | VD |
|--|-------------|-----------|
| A. Attention | | |
| 1. There was something interesting at the beginning of the game that caught my attention. | 4.62 | SA |
| 2. The design of the game interface is attractive. | 4.45 | A |
| Grand Mean | 4.54 | SA |
| B. Relevance | | |
| 1. It became clear to me how the content of the game is related to things I already knew. | 4.32 | A |
| 2. I liked the game so much that I would like to learn more about the subject covered by it. | 4.15 | A |
| 3. The content of the game is relevant to my interests. | 4.12 | A |
| 4. I could relate the content of the game to things I've seen, done, or thought. | 4.23 | A |

| Parameters | Mean | VD |
|--|-------------|-----------|
| 5. The content of the game will be useful to me. | 4.40 | A |
| Grand Mean | 4.24 | A |
| C. Reliability | | |
| 1. The game was harder to understand than I would like. | 2.57 | MA |
| 2. The game had so much information that it was difficult to identify and remember the important points. | 2.67 | MA |
| 3. The activities of the game were very difficult. | 2.33 | D |
| 4. I could not understand a good portion of the game material. | 2.18 | D |
| Grand Mean | 2.44 | D |
| D. Satisfaction | | |
| 1. I learned some things with the game that were surprising or unexpected | 3.92 | A |
| 2. I felt good after completing the game. | 4.18 | A |
| Grand Mean | 4.05 | A |
| E. Immersion | | |
| 1. I did not realize the time passing while playing. | 3.92 | A |
| 2. I struggled to get good results in the game. | 3.33 | MA |
| 3. There were times when I wanted to give up the game. | 2.67 | MA |
| 4. I felt stimulated to learn from the game. | 3.72 | A |
| Grand Mean | 3.41 | MA |
| F. Challenge | | |
| 1. I liked the game and did not feel anxious or bored. | 4.00 | A |
| 2. The game kept me motivated to continue using it. | 4.25 | A |
| 3. This game is adequately challenging for me; the tasks are not too easy or too difficult. | 4.13 | A |
| Grand Mean | 4.13 | A |
| G. Social Interaction | | |
| 1. Collaboration in the game helps learning. | 4.53 | SA |
| 2. The game supports social interaction between players. | 4.62 | SA |
| Grand Mean | 4.58 | SA |
| H. Fun | | |
| 1. I would play this game again. | 4.23 | A |
| 2. I was hoping for the game to end soon. | 3.03 | MA |
| Grand Mean | 3.63 | A |
| I. Knowledge | | |

| Parameters | Mean | VD |
|--|-------------|----------|
| 1. After the game, I can remember more information related to the theme presented in the game. | 3.93 | A |
| 2. After the game I feel that I can better apply the themes related to the game. | 4.27 | A |
| Grand Mean | 4.10 | A |

Legends:
 VD – Verbal Description
 SA – strongly agree; A – agree; MA – moderately agree; D – disagree

The respondents felt the game was generally good. It related to their existing knowledge, piqued their attention, was in line with their personal interests, allowed for linkages with their experiences, and was viewed as valuable, as evidenced by their finding it relevant ($M=4.24$). However, they expressed skepticism regarding the game's dependability ($M=2.44$), notably in relation to its degree of difficulty, amount of information presented, and readability. Despite this, they said they were happy with the game ($M=4.05$), thought it was educational and offered surprise or unexpected learning experiences ($M=3.92$), and that it made them feel good ($M=4.18$).

Studies have demonstrated that educational games are more likely to be viewed as relevant and engaging when they correspond with learners' prior knowledge and personal interests (Savery & Duffy, 2001). The respondents' worries regarding the game's dependability, particularly with regard to the degree of difficulty, information overload, and comprehensibility, are in line with other research emphasizing the significance of creating games that strike a balance between challenge and accessibility (Tuomisto, 2018).

The respondents' assessments of immersion were generally favorable ($M=3.41$). They felt inspired to learn from the game, encountered modest hurdles, and felt engaged while playing, albeit they occasionally had periods of frustration. In a physics game, Hamari et al. (2016) investigated the connection between immersion and learning. They discovered that greater immersion, as evidenced by a feeling of presence, involvement, and flow, was linked to improved learning results. Deep cognitive processing and increased motivation were fostered by immersive game experiences, which improved learning.

The challenge level of the game was rated favorably ($M=4.13$). The respondents agreed and voiced their delight, showing that they relished the game, didn't feel anxious or bored, and discovered a good balance between challenge and fun.

The respondents gave the social interaction component of the game a good rating ($M=4.58$). They were adamant that social connection among players was efficiently promoted by the game ($M=4.62$) and that

teamwork inside the game improved learning ($M=4.53$). The respondents stressed the benefits of teamwork and social interaction for learning, showing that the game exceeded their expectations in this area. Everyone who participated said they enjoyed the game and were willing to play it again in the future ($M=3.63$). They also showed no sign of wanting the game to end, indicating that they were enjoying it and wanted to keep playing.

The respondents gave their newfound knowledge a positive evaluation ($M=4.10$). They concurred that the game improved their recall of details pertaining to the game's theme and expressed confidence in their improved ability to apply the taught concepts in practical settings.

These findings support the idea that game-based learning can improve student engagement and appreciation for mathematics. According to White & McCoy (2019), game-based learning can increase students' mathematics awareness, as long as it is implemented in the classroom. Additionally, playing games in the classroom can help students feel more at ease and reduce their perception of mathematics as being difficult. According to Ke (2019), students can improve their mathematical knowledge through participating in problem-solving activities in gaming.

The findings show that participants gave the game generally positive evaluations, with social interaction receiving the highest marks, followed by attention, relevance, difficulty, and knowledge. The mean for social interaction was the highest ($M=4.58$), showing a high degree of agreement and placing it top among the dimensions that were considered. Attention came in second ($M=4.54$) while relevance came in third ($M=4.24$). Additionally, challenge and knowledge were rated favorably, placing fourth and fifth, respectively, ($M=4.13$ and $M=4.10$). Satisfaction came in sixth ($M=4.05$). Fun ranked sixth ($M=3.63$) which is considered to be moderately favorable. Immersion ($M=3.41$) also garnered a relatively favorable appraisal, placing ninth overall. The lowest rating was given to reliability ($M=2.44$) suggesting disagreement and placing it tenth.

Although there were differences in the rankings and means for each particular component, the aggregate mean of 3.90 indicates that the respondents expressed overall agreement and a good opinion of the game across these dimensions. The results of the respondents' evaluations of the "JC Snakes and Ladders Game" are consistent with previous research on player satisfaction and game evaluation. Participants gave positive ratings to the characteristics of social interaction, attention, relevance, difficulty, and knowledge, which is consistent with the significance of these elements in game evaluation.

The study by Kiili et al. (2014) emphasizes the value of using flow theory to evaluate the caliber of

educational games. A high level of flow experience and a favorable game evaluation are influenced by the flow experience characteristics of control, clarity of goals, and challenge-skill balance.

This is consistent with the "JC Snakes and Ladders Game's" high ratings for challenge, information, and satisfaction. In addition, Yu et al.'s study from 2021 stresses the influence of difficulty and engagement on learning outcomes in game-based learning settings. The positive scores for challenge and difficulty in the "JC Snakes and Ladders Game" are consistent with the positive impact of challenge on learning, both directly and through greater engagement.

Additionally, the research by Johnson et al. (2015) offers insights into how players perceive various game genres, including the newly emergent MOBA games genre. This study emphasizes that cooperative games, which place an emphasis on social interaction, may have lesser levels of immersion but can still be satisfying due to competitiveness and teamwork. This result is consistent with the high social interaction rating in the "JC Snakes and Ladders Game".

The good ratings of the "JC Snakes and Ladders Game" across a variety of dimensions are supported by the available research, which also offer theoretical justification for the significance of social interaction, attention, relevance, difficulty, and knowledge in game evaluation and player experience.

CONCLUSION

The study concludes that with its intriguing interface, the game was able to capture the attention of its users and fully immerse them in exciting and relevant mathematical concepts. The students did not just enjoy the game; they were able to learn the subject quickly as it helped them understand the presented concepts clearly. Furthermore, the structure of the game, in which students competed with other groups, fostered their collaboration and communication skills through group discussion, removing students' misperception that Mathematics is dull and monotonous. The students learned to constructively assist one another to ensure that all group members understand how to solve the problems given in order to win. Incorporating the "JC Snakes and Ladders Game" into the classroom is advantageous to student learning.

In relation to that, Mathematics teachers may use "JC Snakes and Ladders" developed by the researchers to teach the concepts and enhance the students' skills in course Mathematics in the Modern World. Mathematics teachers should develop attention, relevance, satisfaction, immersion, challenge, social interaction, fun and knowledge in instructional materials like interventions for the students to gain mastery of the concepts and skills in solving mathematics problems.

Mathematics teachers should modify approaches to make learning fun and enjoyable since students learn best when they find activities engaging and useful.

Utilization of the intervention is recommended for other teachers experiencing similar problems as presented in this study. Researchers may also try the game in other disciplines to generate evidence on its effectiveness in helping students improve their academic achievement.

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AUTHORS' CONTRIBUTIONS

J.L. and C.J.R are the researchers and the game designers, C.A.R planned the research design and served as the Statistician of the study and conducted the data analysis, and C.J.J. served as the consultant and the language expert.

CONFLICT OF INTEREST

This investigation holds no conflict of interest across and between the samples of the investigation, institution where it was conducted, and other affiliations.

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ABOUT THE COVER

THE HUES AND SHAPES OF R&D: The vibrant colors and captivating transitions of a sunset reflect the dynamic nature of R&D, which continuously evolves to foster groundbreaking discoveries and propel advancements forward. Likewise, just as the coastline is reshaped by the relentless ebb and flow of tides, R&D necessitates adaptability and steadfast commitment to continuous improvement, enabling the navigation of challenges and the seizing of opportunities.

 Kenneth Dave Castillon/RDI IT Support Staff



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