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Cognitive Academic Translanguaging: A Pedagogical Tool in Attaining Climate Literacy through Modular Instruction

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ABSTRACT

Embedding the concept of translanguaging to deliver climate change education or climate literacy is a step to build up awareness and longer-term actions to enhance environmental quality. In partnership with Children Optimization for the Revitalization of Environment (CORE), an organization in Bacolod City whose aim is to inculcate values of environmental stewardship through education, this qualitative study elaborated on the use of cognitive academic translanguaging as an instructional tool in attaining climate literacy through self-learning modules. Multimodal Discourse Analysis (MDA) was used to dissect selected CORE climate-literacy modules to determine the translanguaging, textual, and non-textual features and the pedagogical implications of these linguistic features to craft an enhanced version of the instructional material for the Junior High School students. Using a purposive sampling technique, a one-on-one interview with eight CORE Ecological Saturdays (ECOSATS) program graduates took place to collect data about their experiences to supplement the findings of the module dissection process. The study results revealed that embedded language is preferred compared to matrix language as students are more guided by their first language (Hiligaynon). Also, self-learning modules are more effective if they use the pupil-directed type of translanguaging so students can accomplish the tasks and activities in the module with little to no help or guidance from the more knowledgeable others. Furthermore, using non-textual features such as colors and italics elevates students' learning experience and makes self-learning active and engaging. Results also suggested that to align all linguistic aspects of the module better, consistency in the use of the textual and non-textual features must be appropriately applied in crafting the module, as the findings of the study at once fueled the need for immediate action towards climate change education.

Keywords

translanguaging, cognitive academic translanguaging, climate change education, climate literacy, linguistic features, multimodal discourse analysis, self-learning modules

INTRODUCTION

Climate change is an existential threat to various species and humanity Zirnov et al. (2022). In the Philippines, the Department of Education's (DepEd) Enhanced Basic Education Information System (EBEIS)

collected data from the academic years 2009 to 2018 and found that 43,810 out of 47,000 public schools in the country live through natural hazards at least once in eight years. Tropical cyclones affected 39,738 schools, floodwaters affected 25,191 schools, and for coastal area concerns – 5,824 schools were impacted. These numbers give strong evidence that learners all over the country are going through the impacts of climate change, and for years, they remain the most vulnerable sectors, and that is why we must prepare, educate, and inform them about it.

On this account, the DepEd (2021) pursued action to address the climate needs of our country through the Enhanced Basic Education Act of 2013 or the K-12 Act, which strengthened curriculum integration of key climate change concepts across various grade levels. Through this, Disaster Risk Reduction and Management Service (DRRMS) and the Climate Change Act of 2009 (CCA) concepts are integrated into various subject areas such as Science, Health, Araling Panlipunan, and Edukasyon sa Pagpapakatao starting from Kindergarten to Junior High School. Alongside the changes in the curriculum, co-curricular activities also came into action, such as the establishment of the Youth for Environment in Schools Organization (D.O. 93, s. 2011) and the integration of Gulayan Sa Paaralan, Solid Waste Management, and Tree Planting Under the National Greening Program (NGP) (D.O. 5, s. 2014).

To add up to the continuous work of the Department of Education (2021), co-curricular activities such as National Climate Change Conference (NCCC), Climate Action Advocacy Show, The Green Beat Initiative: Environmental Journalism Training for Campus Journalists, Change the Current: Climate Action Training for Adolescents, Climate Science Olympiad, and again, Youth for Environment in Schools Organization were added and reinforced. However, all of these can be considered performative work, which means it lacks timelessness for future generations. What we need here in the Philippines is something more stabilized and includes complete focus.

To combat this already-felt catastrophe, Krasny et al. (2016) highlighted the importance of climate change education or climate literacy to address safety and risk reduction and longer-term actions to enhance environmental quality. As a call to action, Malay (2019) emphasized how essential it is for the public, especially the future generation, to be educated on climate change. Environmental education must be an integral part of the education system in the Philippines. Giving light on why others should care, Klauth and Ortega (2017) highlight the many threats of climate change to children's personal well-being, survival rate, and service access in the Philippines, including water, sanitation, education, nutrition, and health.

Moreover, Johnston (2019) identifies climate change literacy as a vital factor in strategies for fulfilling SDG 13, the United Nations Sustainable Development Goal. «Take urgent action to combat climate change & its impacts.» Expanding climate change literacy – personally, institutionally, and societally – entails knowledge of why it is essential, who must be involved, what it comprises, when and where it takes place, how to deal with hurdles that arise, and what the result, a climate-change-literate citizen, will look.

Going further, to immerse deeply in pro-environmental behavior, one must be an environmental activist who aims to protect the environment, including the intent to act through environmental organizations that have shared goals (Alkaher, 2020). For this reason, the research team has partnered with the Children Optimization for the Revitalization of Environment (CORE), a local organization aiming to inculcate values of environmental stewardship via education, experiential learning, and exposure to a sustainable and balanced ecology Erwin P. Nicavera and Erwin P. Nicavera (2022). Led by Elmeer Meeynard Calimpos at

Bacolod City, the ultimate goal of this study and the organization is to create an enhanced version of the module that will help Junior High School students attain knowledge and be environment-wise.

Embedded in the module is the concept of translanguaging, a pedagogical tool that supports learning within bilingual classrooms (Jones, 2017). It stems from a more extensive umbrella called «Learning Through Two Languages,» trickling down to flexible bilingualism, where translanguaging could be found as a growing trend in many countries (Jones, 2017). In the study of Wei and Ho (2018), they mentioned that previous researchers Colin Baker and Cen Williams see translanguaging as a practice and a process that involves the dynamic and functional integrated use of different languages and language varieties. Moreover, they stated in their research that translanguaging pedagogy helps re-examine the role of L1 in second, foreign, and additional language learning and teaching.

Translanguaging helps people develop new understandings in their social interaction and create a free and equal environment where everyone is given a voice (Deocampo, 2016). This is because when learners are advised to use their home or mother-tongue language, they can clarify and talk about topics more deeply because they are not limited to just one language (Ittner, Marquez, and Schulze, 2019).

In addition, Park (2013) wrote that implementing multilingual practices remains an appealing task for language educators and researchers. It may allow multilingual individuals to acknowledge and use a fuller range of linguistic practices. Learning happens when there is an interaction between learners in the classroom. This could be facilitated by advocating the use of home languages to encounter and create connections that lead to high-level comprehension (Omidire, 2019).

Specifically, the research team used Cognitive Academic Translanguaging (CAT), a type of translanguaging for teaching and learning, either teacher-directed or pupil-directed, emphasizing academic language and subject-specific terminology. Rooting translanguaging to the theory of analysis of code-switched data sets written in «Duelling Languages: Grammatical Structure in CodeSwitching» by Carol Myers-Scotton in 1993, the identified translanguaging items were identified into two: Embedded Language (EL) and Matrix Language (ML). The ML is the language that, based on the Morpheme Frequency Criterion, frames the syntactic structure of code-switched discourse. It is assumed to be the speaker's first language or the speaker's better-known language. On the other hand, the EL only plays the role of a gap-filler language (Tambe, 2019).

Aside from the classification of translanguaging from its language structure, the researchers also classified it based on classroom utilization according to the study of Jones (2017), where it can be labeled as Teacher-Directed Translanguaging or Pupil-Directed Translanguaging. Teacher-directed translanguaging takes place when the teacher attempts to scaffold the translanguaging activity. This can be through choosing appropriate reading material and providing writing frames.

In Wales, the teacher presented «translanguaging cues» to instruct emergent and competent pupils on completing translanguaging activities (Jones & Lewis, 2014). These cues can be given orally, in written form, or both. Pupil-directed translanguaging, conversely, is translanguaging activities done independently by more-competent bilinguals. This can be observed when students work independently and choose how to complete the translanguaging activity.

Meanwhile, Orellana and García (2014) stated in their study that teacher-directed translanguaging has transformative potential. Here, translanguaging as pedagogy is contextualized through how teachers with different characteristics use it in various

classrooms and how translanguaging involves co-learning by drawing on teacher-student interactions.

Furthermore, the study of Pentang & Bautista, (2022) gave roots to the use of modules in attaining climate literacy. The findings of his study demonstrated that the learners strongly agree that the use of Self Learning Modules (SLMs) has a good influence. It also disclosed that learners manifested satisfactory performance on SLMs. Although many studies have tackled translanguaging, this study is the first to incorporate it in the module-making process and instructional material analysis, which aims to be used in a multilingual country along with the plan of inculcating climate literacy. As a pioneer study, academic papers have yet to be done locally in Bacolod City, which is the gap the research team intends to fill.

The team detailed the implications of using cognitive academic translanguaging as a pedagogical tool to teach climate literacy to junior high school students by embedding it in the final output of this study. For data collection, method triangulation was used to collect CORE's select existing modules for dissection, basic information from the participants, and interviews to assess lived experiences. Multimodal Discourse Analysis is the research design that served as the backbone of this study as the research team looked into the field, tenor, and mode.

According to Gee and Handford (2012), field, tenor, and mode vary as the speaker or writer's lexical and grammatical choices respond to, and at the same time, help construct the context in which language is used. The field is the ideational resources that point to the topic/content. The tenor is an interpersonal resource that enacts relationships and conveys attitudes. Mode, conversely, is textual resources that indicate the role language plays in the context, like whether the language constitutes or accompanies activity. As the need for immediate action fuels this study, all the researchers involved believed that climate change is real and must be taken seriously (Zirnov, Mardon, P. Johnson, and J. Johnson, 2021).

This study elaborated on the use of translanguaging as a pedagogical tool in attaining climate literacy through self-learning modules. Specifically, it determined the translanguaging, textual, and non-textual features of the selected CORE climate-literacy modules and the pedagogical implications of these linguistic features to craft an enhanced version for the Junior High School student-beneficiaries.

The study underwent a long process to attain the end. First, selected CORE climate-literacy modules were analyzed through Multimodal Discourse Analysis. This method of analysis is an approach that analyzes various modes of communication, such as text, color, and images, in a discourse. In this study, the researchers focused on analyzing the linguistic features of the modules, which include translanguaging, textual, and non-textual features. These features were identified, dissected, and categorized to find common features across all categories. These qualitative data helped in the thematic analysis, where features were analyzed to form patterns and themes.

Furthermore, the themes formed were supplemented by the data gathered during the interviews to arrive at the pedagogical implications of the analysis. To elaborate, the CORE Research, Education, and Development Committee is immersed in this study by assisting the research team during the interview. The researchers interviewed selected Ecological Saturdays (ECOSATS) program graduates from Purok Crossing Otso, Barangay Tangub, Bacolod City. As a result of the entire rigorous process, the research team developed the enhanced CORE climate-literacy module for secondary-level students, which is the goal product of this research.

METHODOLOGY

This qualitative research sought to elaborate on

the use of cognitive academic translanguaging as a pedagogical tool for attaining climate literacy through self-learning modules. Multimodal Discourse Analysis (MDA) was used to dissect CORE modules 3 to 7, which determined the field, tenor, and mode to see what the language does, who the doers are in the linguistic endeavor, and what the effect of the language on the users is. The participants of this study are the eight selected CORE's Ecological Saturdays (ECOSATS) program graduates from three different batches or waves at Purok Crossing Otso, Barangay Tangub, Bacolod City. As the selection was based on specific criteria and characteristics of the community and the study's objective, a purposive sampling technique was followed to determine the participants, composed of two males and six females ranging from 11 to 15 years old. All of them have completed the organization's program and have good performance and attendance during the ECOSATS classes as chosen by CORE's founder and executive director.

The data collection process was divided into three main phases to gather the needed data for the study. For phase one, the researchers secured permission and a contract from CORE to obtain the adopted community's location, CORE modules, and interviewees' names, including their basic information. For phase two, after the data gathering agreement, the researchers printed the CORE modules three to seven. They then proceeded to the dissection process, where they determined the modules' translanguaging, textual, and non-textual features. Lastly, for phase three, a one-on-one interview with CORE graduates took place to collect data about their lived experiences to support the findings of the multimodal discourse analysis.

Data collection was subjected to method triangulation merging information from different sources gathered in different ways to ensure validity. This study utilized multiple methods to comprehensively fulfill the research objectives, including document or module dissection or analysis, semi-structured interviews, and preparatory interviews with the Executive Director of CORE. Meanwhile, a local research expert in the field was hired to do the same procedures in the data analysis with the same data set collected as the researchers did to establish the reliability of the results. The findings were then compared and had at least 70 percent similarity in the same content, which generated high reliability.

The application of multimodal discourse analysis was consistent throughout the process. This qualitative method of analysis aims to consider how multimodal texts are designed and how semiotic tools such as color, framing, focus, and positioning elements contribute to the meaning-making of the text. First, the data collected from phase one, which is the basic information of the participants, was scanned by the research team to determine the interviewees for phase three. From the dissection process, data from the modules was laid out into a table to identify the occurrence of translanguaging, textual, and non-textual features.

In the first step of module dissection, translanguaging features or items from each module were identified and specified based on the matrix language frame and types of translanguaging. Translanguaging items were identified whether they were embedded or matrix language, and pupil-directed (PD) or teacher-directed (TD). In analyzing textual features, sentences with translanguaging features undergo structural analysis to determine their syntactic constituent and semantic roles. In the non-textual features, the emphasis style of the identified translanguaging features was determined. All linguistic feature categories were scrutinized to determine the top-ranked matrix language frame, type of translanguaging, and high-frequency textual and non-textual features separately. Lastly, the

top three high-frequency textual and non-textual features were specified across all categories for the further finding of themes.

The qualitative data from the dissection was coded by categorizing and assigning properties and patterns to the collected data. The researchers aligned the patterns leading to answering the research questions. For the last part, data from the interviews were collected and used as a supplement for the pedagogical implications alongside the actual clippings from the CORE modules to strengthen the claims of the study. The analysis concluded by giving out the data where implications based on the results were presented. The implications were used to form conclusions and recommendations that served as the basis for creating the Junior High School climate-literacy learning modules, which is this study's goal product.

In this study, the participants' primary information was kept anonymous, and the data collected remained confidential and was used for research purposes only. Permission from the partner organization and the concerned offices in the university were also taken before collecting data. Simultaneously, the parents or guardians and the participants were also presented with a data-gathering agreement before the interview. In gathering the consent, the team signed an agreement with CORE pledging an oath of confidentiality wherein monetary sanctions costing ten thousand (10,000) pesos were implemented to ensure that all these ethical measures would be followed in case either team refused to respect the agreement.

RESULTS, DISCUSSION, AND IMPLICATIONS

Based on the analysis, there are 134 translanguaging features found in CORE's selected five climate-literacy modules (modules 3 to 7). Of these 134, 24 were from module 3; 25 were from module 4; 26 were from module 5; and 21 and 38 were from modules 6 and 7, respectively. One hundred thirty-two of these translanguaging items are embedded, and the two are matrices according to their language frame. A total of 82 items are identified as pupil-directed, while 52 are considered teacher-directed when determined according to their type of translanguaging.

The study of Mugo and Ongo'nda (2017) supports the findings of this section. The researchers wrote that the Matrix Language Frame, or MLF is a production-based theory that explains the morphological, grammatical, and syntactic coordination of various language units in code-switching speech. The premise of this theoretical frame states that the matrix language (base language) exists as a dominant language frame into which the code switches are inserted as the embedded language (guest language) items. Therefore, the assumption is that the ML provides most of the words, especially functional words/ morphemes, while the EL contributes a few lexical items that must fit properly into the appropriate slots in the sentence structure.

The same assumption was found faithful in the climate-literacy modules of the CORE, wherein the majority of the translanguaging features were identified as an embedded language. This helps the sentences remain in the students' first language, Hiligaynon, or the matrix/base language. In this way, students could understand the English translanguaged features as the Hiligaynon language still carries the grammatical function of the sentence.

Meanwhile, the study of Jones and Lewis (2014) also intensified the concept of teacher-directed and pupil-directed types of translanguaging. According to them, teacher-directed translanguaging occurs when the teacher attempts to scaffold the translanguaging activity. This can be done by choosing appropriate reading material and providing writing frames. On the other hand, pupil-directed translanguaging is translanguaging activities done independently by

more-competent bilinguals. This can be observed when students work independently and choose how to complete the translanguaging activity.

In the findings of this section, 82 of the translanguaging items are pupil-directed, more than the 52 teacher-directed translanguaging features. This means that climate-literacy modules are designed for self-learning instruction and that students can use them even with little to no guidance from the more knowledgeable others. Thus, CORE modules are fitted for self-learning modality as the pupil-directed type of translanguaging is designed for more-competent bilinguals who can work independently.

Moreover, the 134 translanguaging items' textual features were examined thoroughly as their syntactic constituents and semantic roles were identified. Under syntax, the grammatical functions determined are adjunct, bare infinitive, direct object, gerund, indirect object, intransitive verb, object complement, subject, subject complement, and transitive verb. Of these ten syntactic constituents, direct object, subject complement, and subject prevailed with 47, 33, and 27 translanguaging features aligned with them, respectively. On the other hand, semantic roles distinguished are agent, benefactive, experiencer, goal, instrument, locative, patient, source, and theme. Dominantly, out of these 134, 50 items were recognized as a theme, and 17 were an agent. However, 28 of these translanguaging features also appeared to have no semantic role. It was coded as NSR or No Semantic Role.

In addition, the three high-frequency syntactic constituents were separately analyzed to detail their specifications. Of the 47 direct objects, all are embedded, 25 are teacher-directed, while 22 are pupil-directed. Semantically, 33 are themes, while non-textually, 25 are italicized, and 17 are normal text.

A direct object receives the action of the verb. It being high in frequency means that translanguaging is used to explain the presented action further. Mukhopadhyay (2020) stated in her study that using translanguaging, she was able to draw students' attention to lexical equivalents in Telugu, Hindi, and English action words which helped her compare grammatical aspects like change in word forms to convert words from present to past tense in the following texts and sentences.

The 33 subject complements are also all embedded, with 24 determined as pupil-directed while nine are teacher-directed. On the same level, 11 are themes, and 11 have no semantic role, while the majority are italicized and normal text with 11 and eight, respectively. Subject complement has a high frequency due to the constant use of the S-LV-C pattern in the modules. This indicates that translanguaging is primarily used to aid simple sentences as it academically aligns with the elementary grade level. The students further elaborated that translanguaging allows them to generate more ideas and write about a topic thoroughly.

The 27 subjects are also all embedded, with 25 identified as pupil-directed and two as teacher-directed. As for their semantic roles, 12 are agents, and seven have no semantic roles, while 11 and eight are italicized and normal text correspondingly. The subject is the first word learners see when reading a sentence. High frequency suggests that translanguaging can be used as a tool for easier digestion of the words and sentences that follow the subject. This strategy could be helpful to learners who need help understanding deep Hiligaynon wordings.

Lewis, Jones, and Baker (2012) support this as they stated in their study that in their observed translanguaging sequence, subjects encode definitions in one language but retrieve and produce names in their other language. They further elaborated that translanguaging allows more effective learning due to cross-language semantic remapping that occurs when the encoded information in one language is retrieved to enable production in the

other language.

Furthermore, the three high-frequency semantic roles were also detailed for analysis. All 50 themes are embedded, with 27 as pupil-directed and 23 as teacher-directed. Syntactically, 33 are direct objects, and 11 are subject complements, while non-textually, 29 are italicized, and 13 are normal text. As for the 28 items with no semantic role, 26 are embedded, and two are matrices, while 19 are pupil-directed, and nine are teacher-directed. Of these 28, 11 are subject complements, and seven are subjects. Meanwhile, 10 are just normal text, and seven are italicized. Lastly, the 17 agents are also all embedded, with 14 of those recognized as pupil-directed and three are teacher-directed. Subjects appeared with 12, while italicized and normal text have five each.

The findings indicated that 50 out of 134 translanguaging features semantically have a role of a theme. In the list of semantic roles, the theme refers to the entity that is moved by the action, event denoted by the predicate, or whose location is described, Kearns (2017). It is the entity that directly receives the action of the verb. Meanwhile, 17 of these translanguaging items function semantically as agents. The agent is the 'doer' or instigator of the action denoted by the predicate. It is the initiator of some action, capable of acting with volition. The Research Education and Development Committee of CORE must have taken this pattern as Khote (2018) explained that most students practice codeswitching of informal to formal register in their everyday language by expressing through noun phrases with abstract nouns and verbal groups, making learning more efficient.

On the other hand, high frequency in No Semantic Role (NSR) was justified in the study of Portner, Maienborn, and Heusinger (2019), as they revealed that thematic role approaches were confronted with several problems concerning the often vague semantic content of roles, their coarse-grained nature as a descriptive tool, the lack of reliable diagnostics for them, and the empirically inadequate syntactic generalizations which mean that some words in the sentences do not need to have a semantic role to function, and therefore exists for syntactic purposes alone.

Wimmer (2021) identifies textual features as elements existing independently of the main text and intended to enhance the reader's experiences. Syntactic constituents and semantic roles of the translanguaged items were specified where it appeared that syntactically, items function as direct objects, subject complement, and subject. At the same time, semantically, the majority are themes, and there are also several items with no semantic role. With this, we can derive that most translanguaged features are the lesson's main concepts that guide the learner to focus on the crucial sections of the self-learning modules.

The non-textual features were used to emphasize content in the CORE climate-literacy modules. Under this non-textual category, there were 12 individually coded emphasis styles revolving around bold, italicization, capitalization, colors, underlined, quotation marks, and parenthesis. For most codes, three appeared similar across all codes, mainly the italicized, normal text, and colored text with 72, 29, and 22 items, respectively. Hence, these three were identified as high-frequency non-textual features.

Of the 72 italicized translanguaging items, all of which are embedded, 46 are pupil-directed, and 26 are teacher-directed. Syntactically, 27 are direct objects, 20 are subject complements, and 17 are subjects. Semantically, 31 are themes, 12 have no semantic role, and 11 are agents.

The dominant occurrence of italics in the CORE climate-literacy modules showed that italics emphasized foreign words or terms not written in the students' first language, Hiligaynon. According to the University of Sussex (2023), most commonly, italics

are used for emphasis or contrast — that is, to draw attention to some part of a text. Italics are also used when citing foreign words when talking about them. Foreign words here refer to the terms not written in the students' first language.

Furthermore, McAdoo (2015) pointed out that APA Publication Manual (pg. 105) does recommend using italics for the «introduction of a new, technical, or key term or label,» adding «(after a term has been used once, do not italicize it).» This point supported the dominant appearance of italics in the modules as italics signal the readers what they should pay close attention to, which are the translanguaging items or the main concepts of the lesson.

All 49 normal texts are also embedded, with 28 identified as pupil-directed and 21 are teacher-directed. Syntactically, 17 are direct objects, nine are subject complements and object complements, and seven are subjects. As for the semantic role of these normal texts, 14 are themes, while 10 have no semantic role.

The translanguaging features tagged as normal text or without emphasis style reflect the need for more proofreading for the items that should have been emphasized. This aspect is something that the researchers could enhance or improve in creating the research product. From another perspective, although the frequent appearance of normal text could mean that not all translanguaging features should be emphasized, this could also indicate inconsistent formatting in making the climate-literacy modules.

Of the 22 colored texts, 20 are embedded, and two are matrices, while 18 are pupil-directed, and four are teacher-directed. Most of these colored texts are subject complements and subjects with ten and seven, respectively. While semantically, six have no semantic roles, five are experiencers, and four are agents and themes.

Colored text arriving third as a high-frequency feature with combined blue and green font colored text says that the organization wants to bring students closer to environmental topics and discussions. According to weebly.com in their discussion on An Academic Writing Guide to Genre & Format, colored text can be used to emphasize, embellish a written piece, or convey a certain mood or feeling associated with the color of choice. This support points out that using green and blue fonts in the self-learning modules helped the organization convey its environmental advocacy to the students in tapping their moods or feelings.

Lai et al. (2022) wrote that using non-textual elements had been regarded as an effective teaching approach to support language learning. Using non-textual elements in learning positively impacts learners' comprehension of content, generates thoughts and ideas, and helps them overcome learning difficulties. It has been extensively used in lessons to improve learning. The same is true in the results of the non-textual features wherein the use of italicization and colors increased the students' motivation. Indeed, using illustrations as visual prompts can attract the student's interest, encourage learning, and develop their critical intellectual support, which means the learners are quickly engaged in an active learning process through illustrations. It can facilitate their understanding of a particular topic effectively.

Moreover, Kian and Gorjian (2018) supported those typographical cues such as bolding, underlining, choice, background, capitalization, font size, and italics are techniques used to enhance the importance and visibility of certain linguistic features in written texts. This captured the study's findings wherein italics and colored text appeared on top as high-frequency features. It supported that the use of these emphasis styles increases the visibility of the translanguaging features or items in the climate-literacy modules. It is strengthened by the study of Agarwal et al. (2020), which states that word emphasis in the text is extremely helpful in gaining the readers' attention

to specific information that the authors wish to emphasize.

Three major themes emerged from the gathered and analyzed data. These themes disclosed the pedagogical implications of the study supported by the dissection statistics of the three linguistic features, namely translanguaging, textual, and non-textual, and the semi-structured interview done with CORE's Ecological Saturday program graduates in the learning community of Brgy. Tangub. These themes are categorized under the headings: embedded and pupil-directed language assistance, subject-object-theme prominence, and non-textual cooperation.

As for the first theme, the translanguaged features in the climate-literacy modules were easy for the students to understand as these were only embedded or guest language, and the grammatical frame of each sentence is still in the students' first language, which is Hiligaynon. Most of these items were also pupil-directed, meaning the self-learning modules give students greater control, ownership, and accountability over their learning. Students revealed that they did not have a hard time understanding the translanguaged items or the English concepts, as the Hiligaynon language was mainly utilized with the assistance of the applied embedded and pupil-directed language.

The second theme indicated the subject-object-theme prominence. Syntactically, the translanguaged features or items found function as direct objects, subject complement, and subject. This means that most of the translanguaged features receive the action, perform the action, and tell us more information about the action. Semantically, this reflected that similar to the high-frequency syntactic roles, translanguaging features lead students to identify the main and essential concepts of the lessons. This can also be tied with the distinctness characteristic of the semantic roles where every argument of every verb is distinguished from the other arguments by the role it is assigned.

Therefore, translanguaging features or items give students information on what to do as translanguaged words agree with the actions. This fact makes the learning modules self-learning as students are guided to understand and perform tasks independently through the subject-object-theme prominence in the analyzed translanguaging items.

The use of translanguaging revolved around actions. The subject serves as the doer of the action and the direct object as the receiver of the action. Also, the theme acts as the entity that receives the action of the verb when it comes to semantic roles. Creese and Blackledge (2015) stated that languages in contact mutually influence each other which explains why most translanguaging items are connected to words affiliated with the movement.

The third theme highlighted non-textual cooperation. Using different emphasis styles helped students determine important concepts or topics in the self-learning modules. Although 49 items are tagged as normal text, the majority are still highlighted using italicization, capitalization, colored text, etc. According to the students interviewed, these typographies have helped them in terms of motivation as these non-textual features capture their attention first or help them focus their eyes on essential concepts.

When asked about the non-textual features of the climate-literacy modules, students expressed that they liked it more when the texts in modules were with colors or emphasis. They also prefer it when the modules are not dominated by text but with a balance of pictures for them to quickly understand the topic. Furthermore, Lai, Tan, He, Said, and Muslim (2022) elaborated that using non-textual elements has been seen as an effective teaching approach to support English learners in language learning. Thus, using non-textual elements in learning positively impacts learners' comprehension of content, generates

thoughts and ideas, and helps them overcome learning difficulties. These findings reflected that the CORE modules become more effective using non-textual features or emphasis, particularly of italics and colors.

Concludingly, the linguistic features and their results reported that translanguaging assisted learners towards effective self-learning using CORE's climate literacy modules. The emerging themes also captured the use of embedded language and pupil-directed translanguaging. Through this, we help learners focus on the more essential concepts of the lesson, which the majority have functioned prominently as subject, object, and theme.

Therefore, it has been revealed that the use of translanguaging positively impacted the learners with the assistance of textual and non-textual features present in the instructional materials. This claim is supported by García (2019) study, where he shared that translanguaging is to educate all learners, regardless of their language practices, to maximize the meaning-making, creativity, and criticality of the students' educational experience.

The study findings uncovered that the CORE climate-literacy modules have significantly impacted its student beneficiaries toward self-learning. The modules have effectively utilized translanguaging, textual, and non-textual features to motivate and engage students in active learning. Despite the study being conducted in a small non-government organization, the research findings could aid the self-learning modality, Alternative Learning System (ALS), Mother Tongue Based - Multilingual Education (MTB-MLE), and strengthen curriculum integration of key climate change concepts across various grade levels.

This research showcased that it is possible to study these areas of education. In line with using two languages, translanguaging in MTB-MLE opens opportunities for learners to exercise their right to learn in their first language and promotes literacy as it hastens the learners' learning process. Using students' first language in explaining climate-literacy concepts allows children to express themselves, contribute to discussions, and develop their intellects as conversations are carried out in a familiar language. The emerging themes entail how cognitive academic translanguaging in teaching and learning could assist the delivery of instruction through self-learning materials that utilize two languages concurrently to explain concepts clearly. Through cognitive academic translanguaging, we begin where the children are, so we can build on what they already know.

However, there were inconsistencies in formatting the structure of the modules, particularly with their syntactic, semantic, and non-textual aspects, as seen in the analysis results. This implies that although the modules follow specific standards and flow and have achieved their goal of effective and quality modular instruction, there are still aspects that need to be aligned to form consistent patterns, such as those mentioned under the linguistic features. These aspects, including the concepts being translanguaged and their syntactic constituents and semantic role in the sentence, and the use of emphasis to highlight concepts in each topic, are the ones to be edited and applied in the enhanced version of the module for the Junior High School students.

In addition, this research study is the first to be conducted under this organization's program and in the local research context. Although outcomes contained positive results as data gathered, and themes emerged appeared to be aligned with the theoretical background and related literature, the researchers recognized the need to conduct further studies using the enhanced version of the module for the Junior High School students to see if conclusions and recommendations followed increased the quality of modular instruction offered by the program of the organization.

Locally, further studies could help improve the

self-learning modality organized by these non-profit and non-government groups. Thus, the findings suggest that to fully evaluate the effectiveness of the self-learning modules for elementary-level pupils, capturing the instructional delivery to see aspects of the learning materials needing improvement would be better. Internationally, this could brighten the impact of the use of translanguaging in small learning communities, just like CORE. Thus, the researchers suggest deepening further the linguistic feature analysis to align translanguaging, textual, and non-textual features concretely. Lastly, this study implies that the results transpired gave additional support and assistance to the utilized related literature and gave supplemental bases in the local research community for further investigation.

CONCLUSION AND RECOMMENDATIONS

Embedding the concept of translanguaging to deliver climate change education or climate literacy is a step to build up awareness and longer-term actions to enhance environmental quality. In this study, the use of embedded language for the translanguaging items is preferred compared to matrix language. Although students can understand both languages, some concepts are still complex for them to comprehend. Using embedded or guest language, students are guided as Hiligaynon serves as the base language and still carries the grammatical function or frame of the sentence.

Considering using two languages, self-learning modules are more effective if they use the pupil-directed type of translanguaging. In this way, students can pull off the tasks and activities in the module with little to no help or guidance from the more knowledgeable others. Students can work independently, and words to be translanguaged in the modules have greater significance in the sentence or are essential concepts of the topic. These technical or key terms usually syntactically function as objects or subjects and semantically function as a theme. These linguistic features help to draw students' attention to the important lessons of the discussion and sections of the modules.

Furthermore, using non-textual features motivates students and makes self-learning active and engaging. As simple as colors and italics could elevate the students' learning experience. Thus, we should have a balance between text and visual illustrations used in the self-learning modules to improve the quality of modular instructional delivery. Consistency in the use of textual and non-textual features must also be followed in formatting the module. To better align all linguistic aspects of the module, textual and non-textual features must be applied consistently and properly, not randomly.

The results and conclusions of the study recommend that the learning community of Purok Crossing Otso, Barangay Tangub, Bacolod City, particularly the leaders and constituents of the community, should continue and persist in supporting the CORE's Ecological Saturday's program and encourage parents to let their students attend the climate literacy education and climate change awareness campaign to strengthen the self-learning modality as the village is located near bodies of water and is prone to marine pollution as a result of improper waste disposal and lack of knowledge of its effect on the environment.

In addition, the Children Optimization for the Revitalization of Environment (CORE) must consistently align the use of textual and non-textual features in the translanguaging items when creating the modules. The organization must first understand the significance of concepts under cognitive academic translanguaging as a pedagogical tool to deliver quality modular instruction.

CORE heroes or volunteers, especially those under the organization's Research, Education, and Development committee, must be able to apply the

use of embedded language and pupil-directed type of translanguaging in making modules. They must note that only those concepts with significant and greater value must be translanguaged. Furthermore, they should attach more pictures or visual illustrations alongside other non-textual features to make the students' learning experience active and engaging.

With the application of embedded language and pupil-directed translanguaging, the Junior High School students of CORE must be able to answer and finish the tasks and activities independently with little to no assistance from the more knowledgeable others.

The Department of Education (DepEd) should utilize translanguaging, textual, and non-textual features to motivate and engage students in active self-learning. The research findings could also aid the self-learning modality, Alternative Learning System (ALS), Mother Tongue Based - Multilingual Education (MTB-MLE), and strengthen curriculum integration of key climate change concepts across various grade levels.

Educators on national and local levels must begin with students' first or base language to tap their knowledge of climate education. Teachers, especially Science majors, could opt to use translanguaging as a strategy to deliver climate-change-related concepts and make discussion on technical terms more effective and easier to comprehend. In this way, they will highlight the impending need to attain climate literacy for students.

Lastly, future researchers interested in conducting the same concept of study are recommended to observe the actual instructional delivery further to improve aspects of the self-learning modality and modular instruction. Researchers should focus more on the effect of translanguaging, textual, and non-textual features applied in the enhanced version of the module on instructional delivery. This will help provide high-quality instruction to students, whether in big or small learning communities. All these support that, indeed, climate change is real and must be taken seriously, as the study's findings fueled the need for further studies of translanguaging as a teaching strategy and immediate action toward climate change education.

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