Examining the research and academic writing needs of preservice elementary teachers: a mixed-methods study

Bonjovi Hassan Hajan[1], Abubakar Jaddal Radjuni[2], Alhisan Utoh-asim Jemsy[3]

[1]Department of Language Education, College of Education, Mindanao State University–Tawi-Tawi College of Technology and Oceanography, Tawi-Tawi, Philippines
[2]Department of Senior High School, College of Education, Mindanao State University–Sulu, Sulu, Philippines
[3]Department of Educational Leadership and Professional Services, College of Education, Mindanao State University–Tawi-Tawi College of Technology and Oceanography, Tawi-Tawi, Philippines

Article Info

ABSTRACT

In teacher education, research plays a central role in the preparation and professional development of preservice teachers. Preservice teachers' knowledge of research and their academic writing skills serve as a pathway for successfully completing a research project. This sequential-explanatory mixed methods study was conducted to provide an in-depth understanding of the preservice elementary teachers' needs on research and academic writing. A total of 80 preservice elementary teachers participated in the study. Data were collected online using a structured questionnaire and an interview guide. Drawing from both the quantitative and qualitative analyses, a multitude of the participants' research and academic writing needs were uncovered. On the research component, the participants' needs encompassed a wide range of areas, including knowledge of research methodology, access to quality data, expert support, among others. As for the academic writing, the participants' needs varied from language use, structure and mechanics to the writing process. Based on the findings, the study outlines practical implications useful for teaching research writing within the context of teacher education.

Corresponding Author:

Bonjovi Hassan Hajan
Department of Language Education, College of Education
Mindanao State University–Tawi-Tawi College of Technology and Oceanography
Sanga-Sanga, Bongao, Tawi-Tawi, Bangsamoro Autonomous Region in Muslim Mindanao, Philippines
Email: bonjovihajan@msutawi-tawi.edu.ph

1. INTRODUCTION

The increasing interest in the transformative role of research has heightened the need for higher education institutions to focus on strengthening curriculum that integrates research writing courses. Consequently, research has become a requirement for obtaining a degree in most undergraduate programs in various countries [1], [2], including the Philippines. Research in higher education offers university students an opportunity to develop a deeper knowledge of research methods and procedures, apply classroom learning in real-world contexts, survey professional literature, and forge meaningful connections with instructors and academics [3]. In the case of teacher education programs, research, commonly undertaken as action research, is central to the preparation and professional development of pre-service teachers [4]–[7]. Action research offers several benefits in teacher education programs which include enabling pre-service teachers to link theory and practice [8], [9], developing them as reflective practitioners [10], [11], and preparing them to become lifelong learners [12].

In the Philippines, teacher education programs require that preservice elementary teachers demonstrate a desire to continuously pursue personal and professional development through the conduct of action research [13]. Thus, all prospective Filipino preservice elementary teachers are required to take a research writing course, research in education. The course is designed to aid prospective elementary teachers in conducting applied or action research that offers empirical bases to advance teaching and learning [13].

Despite the centrality of research in teacher education programs, however, previous studies have shown that preservice teachers continue to face difficulties in conducting and writing research projects. On the research aspect, Fuentes [14], for example, examined the research difficulties of 136 randomly selected Bachelor of Elementary Education (BEED) and Bachelor of Secondary Education (BSED) students who were enrolled in research courses. The findings of the study revealed that students encountered several problems related to the conduct of research. The most common problems were lack of time/class schedule, lack of financial support, lack of background knowledge on research methodology, and lack of research interest. In addition, Toquero [15] explored research competence and research difficulties in action research among 133 randomly chosen preservice teachers. Findings revealed that the preservice teachers had beginning research skills. The study also reported that the participants faced difficulties in conducting their action research. These difficulties were attributed to literature review and the research conceptualization.

As regards the academic writing component, literature also shows that preservice teachers have faced a wide range of challenges. Nur [16] investigated the academic writing of 370 English Education students at a university in Indonesia. The study uncovered that while students perceived the importance of essay elements and academic work such as outlining, paraphrasing and producing complete academic writing, they encountered problems in idea development, grammar, vocabulary, and language expressions. Meanwhile, a study by Sulaiman and Muhajir [17] examined the difficulties of English education students in writing scientific work. The study involved 44 students majoring in English language education in Indonesia. The results indicated that students faced a variety of academic writing difficulties which included grammar, scientific writing style, vocabulary, spelling and coherence, writing arrangement, and punctuation. Three common errors such as spelling, use of capital letters, and punctuations were found. Furthermore, Thao and Quyên [18] investigated academic writing difficulties of English-majored students in Vietnam, including those taking English language education program. The study used a quantitative research design involving 126 students who were in their second-year level. The findings showed that the students encountered a multitude of academic writing difficulties. The most common difficulties faced by the respondents were organization and use of grammar and punctuation/capitalization.

Although considerable research has been devoted to examining research and academic writing in various teacher education programs, majority of these studies have tended to focus either on research aspect or on academic writing, without investigating the two constructs together from the same set of participants. The researchers argue that knowledge of research methodology and academic writing skills should not be taken separately since research report writing, which clearly requires academic writing skills, is an integral skill for preservice elementary teachers taking a research course. Further, little is known about the research and academic writing needs of Filipino preservice elementary teachers.

Hence, this study was conducted to understand the research and academic writing needs of preservice elementary teachers. The present study specifically seeks to answer the following research objectives: describe the research needs of preservice elementary teachers and describe the participants' academic writing needs. The findings of the study hope to advance practical implications that will shed light on the teaching of research writing for teacher education students, especially the elementary education students.

2. METHOD

This study was a mixed methods research, specifically applying Creswell and Plano-Clark [19] sequential-explanatory design. The employment of such research design was consistent with the purpose of the study to capture an in-depth understanding of the participants' research and academic writing needs whereby the qualitative data collection and analysis were used to build on the quantitative results. The data interpretations were sought based on the analyses of the quantitative and qualitative data to provide a comprehensive account of the participants' research and academic writing needs.

The participants of the study were preservice teachers, taking a BEED at a state university in a rural area in the Philippines. A total 80 students were recruited to participate in the quantitative phase of the study. Of the 80 participants, 60 were female students while 20 were male. Majority of the participants were on their third-year level who either had completed a research course, were taking the course, or had yet to take the course during the conduct of the study. Regardless of these classifications, all of them had taken quantitative and qualitative research courses during their senior high school program. The participants were selected through a convenience sampling. Such sampling technique allowed the researchers to choose members of the target population when specific viable criteria, such as accessibility, geographical proximity, or the willingness

to participate are attained [20]. Additionally, it is important to note that the study was conducted during the COVID-19 pandemic; hence, the criteria were significant considerations for a successful participant recruitment. Further, such criteria became the basis for arriving at the sample size of the study. For the qualitative phase, seven students from those who participated in the quantitative strand of the study were recruited. Convenience sampling was also employed in the participant selection. Initially, around 20 students were contacted to participate. However, due to accessibility and willingness to participate, only seven students successfully participated in the semi-structured interview.

Two sets of research instruments were used in the data collection. The first was a 30-item structured survey questionnaire used in the quantitative phase of the study. The survey contained two parts. The first part was a five-point rating scale adapted from the study of Meerah et al. [21], which intended to examine the research areas which the students needed support. The original number of items was 13. Upon validation, some items from the original version were modified and others were removed while new items were added. For instance, writing an abstract was removed since such item measured writing needs instead of research needs. Another example of changes was that choosing an appropriate method of analysis of data was modified, making it more specific to analyzing quantitative data using appropriate statistical tools and analyzing qualitative data using thematic analysis. In addition, some items that were not in the original instrument (e.g. drawing conclusions based on the result of a research study) were added to make a final 15. The second part of the survey was also a five-point rating scale adapted from the study of Al-Hashemi et al. [22] to measure students' academic writing needs. The original version of the instrument consisted of 14 items. Some changes were made upon validation. For example, overall academic writing activity was removed as the item was not deemed specific. On other hand, using proper mechanical conventions (e.g. APA style) was modified to citing sources properly within the body of a paper following certain mechanical conventions (e.g. APA style) and listing references properly following certain mechanical conventions (e.g. APA style). Moreover, presenting ideas objectively was added, making a total number of 15 items. Consequently, the 30-item survey questionnaire was pilot tested among 20 preservice elementary teachers of which the result yielded an overall Cronbach's alpha of 0.97, with 0.97 on the research needs scale and 0.95 on the academic writing needs scale. The second set of the research instrument was a semi-structured interview questionnaire which contained five broad questions on students' challenges in terms of research and academic writing. These questions were formulated based on the results obtained from the quantitative analysis since they intently served as follow-up questions on the initial phase of the study.

The data collection was undertaken purely online. For the quantitative phase, the survey questionnaire was first encoded to Google Forms. A link to the Google Forms was then sent to the potential participants online via Facebook Messenger. Participants' informed consent was sought before access to the survey form was fully granted. This was to ensure ethical standards in the data collection. Participants were given two weeks to answer the survey. After two weeks, the responses were retrieved, converted to an Excel file, and prepared for statistical analysis. For the qualitative phase of the study, an online written interview via Messenger was conducted. Initially, the participants were scheduled for oral interview via Zoom. However, due to internet connectivity issues, the participants opted to receive the interview questions via Messenger and answer them through such platform asynchronously.

The quantitative and qualitative data were analyzed separately. Descriptive statistics was used for performing the quantitative data analysis in which the mean and standard deviation of each item in the survey questionnaire were calculated using the Microsoft Excel. To assess the research and academic writing needs of the participants, aggregate mean and standard deviation for each part of the questionnaire were then obtained. Table 1 presents the interpretation of the aggregate means of the individual items in the survey questionnaire.

On the contrary, content analysis was employed for doing the qualitative data analysis. As qualitative data were meant to substantiate the quantitative results, the units of the qualitative content analysis were the specific areas in research and academic writing where the participants exhibited highest needs. Their accounts with respect to these areas were carefully examined to provide a deeper understanding of the different facets characterizing their research and academic writing needs. The qualitative data analysis was collaborative entailing several consultations among the researchers themselves, with the process being iterative and recursive, to ensure that the themes generated were truly representative of the data collected from the participants.

Table 1. Interpretation of computed means

Range	Interpretation
4.21-5.00	Very high
3.41-4.20	High
2.61-3.40	Moderate
1.81-2.60	Low
1.0-1.80	No need

3. RESULTS AND DISCUSSION

The findings of the study are presented and discussed in relation to the research objectives, as shown in the following sub-sections.

3.1. Research needs of the preservice teachers

The present study aimed to describe the research and academic writing needs of preservice elementary teachers. The first research objective was to describe the research needs of students. To address such, both quantitative and qualitative data were collected from the students. Table 2 shows the quantitative results on BEED students' research needs with items ordered from highest to lowest. As can be gleaned, the students generally had a very high need in terms of all the components of research methodology examined (M=4.44, SD=0.97). The results specifically show that the students needed highest support with respect to analyzing qualitative data using thematic analysis (M=4.53, SD=0.97), interpreting the result of a research study (M=4.53, SD=0.91), collecting survey data (M=4.51, SD=0.93), analyzing quantitative data using appropriate statistical tools (M=4.50, SD=0.93), collecting interview data (M=4.49, SD=0.93), identifying a research problem (M=4.48, SD=0.98), and developing a research question (M=4.48, SD=0.91). These results indicate that while the participants had taken research courses even prior to their tertiary education, they might still lack knowledge on research methods necessary to conduct a research project. The reason for such result may be explained by their needs to have more time to learn advanced concepts and processes before embarking on any research endeavors. Difficulties in research among undergraduate students have been reported in previous research [23], [24].

Table 2. Quantitative analysis of the participants' research needs

Items	Mean	SD	Interpretation
Analyzing qualitative data using thematic analysis	4.53	0.97	Very high
Interpreting the result of a research study	4.53	0.91	Very high
Collecting survey data	4.51	0.93	Very high
Analyzing quantitative data using appropriate statistical tools	4.50	0.93	Very high
Collecting interview data	4.49	0.93	Very high
Identifying a research problem	4.48	0.98	Very high
Developing a research question	4.48	0.91	Very high
Choosing an appropriate sampling technique	4.44	0.95	Very high
Selecting an appropriate research design	4.43	0.95	Very high
Drawing conclusion based on the result of a research study	4.43	1.02	Very high
Developing an instrument	4.41	0.95	Very high
Generating an idea for research	4.39	1.02	Very high
Selecting an appropriate instrument	4.38	0.93	Very high
Doing a literature review	4.34	1.02	Very high
Drawing recommendation based on the conclusion of a research study	4.31	1.12	Very high
Grand mean	4.44	0.97	Very high

The specific research components where the participants needed most support were concerning data analysis and interpretation, and data collection. This finding is not surprising for preservice elementary teachers who may not have gained an advanced practical understanding of the research process yet, because even in-service teachers, for example, would find difficulty in those research areas [25]. Applied knowledge on these research areas is essential since preservice elementary teachers are expected to implement research projects that entail collecting evidence and data analysis and interpretation.

Aside from the foregoing research areas, the participants also reported a very high need on preliminary phases of the research process such as identifying a research problem and developing a research question. This result is consistent with Toquero study [15], where preservice teachers also encountered difficulties on research conceptualization. In fact, Burns [26] stated that generating a preliminary idea is one of the many facets in research where even teachers need additional support and training.

The qualitative analysis, as can be seen in Table 3, shows that the students' research needs were influenced by six themes: research process, researcher, participant, data, expert, and physical resources. Interestingly, these findings suggest that the participants not only needed support in terms of research methodology but also on other relevant aspects. For example, while they verbalized that they needed as much support on the research process such as searching for literature, collecting data, and organizing/managing data, they reported that because of the nature of research as collaborative, their research success may also dwell on other external factors which included physical resources, research participants, and expert support.

The finding on the lack of physical resources may be explained by the students' context since they were from a state university in a rural area. It may be possible that the university may lack resources that students could use in their research endeavors. This result corroborates Fuentes [14] study. Additionally, the participants stated that conducting research may be affected by the research participants which they often do not have control over. This suggests that the context and knowledge of the research participants play a crucial role in their

successful data collection. Moreover, the participants recognized the value of expert support during their research endeavors. For example, they stated that statistician's assistance is crucial in ensuring accurate data analysis.

Furthermore, the participants also perceived data as integral in any research efforts. They stated that knowing how and where to source quality data that is useful to answer the research problem is important for a successful research project. Remarkably, the participants reported that as student researchers, they saw themselves playing a significant role which is indispensable for the success of their research undertakings. For instance, they stated that as student researchers, it was important that they were friendly because they had to deal with their participants–people whom they might not have met yet. They also stated that being meticulous was an essential attribute they needed to develop as student researchers. A potential reason for this result could be that the participants may still be considered as novice researchers. Hence, they may not have fully embraced the attributes of being a researcher yet.

Table 3. Qualitative analysis of the participants' research needs

Generated themes	Theme definitions
Knowledge of the research process	This covers a wide array of research competencies, such as formulating a title, identifying a topic, searching for literature, developing an instrument, collecting data, organizing/managing data, immersing oneself with the data, analyzing data especially statistically using SPSS, interpreting data, data presentation, drawing valid conclusion, and synthesizing data.
Researcher's personal attributes	This refers to personal qualities of a researcher, such as being careful, meticulous, friendly, and dedicated, which are essential in successfully conducting a research study.
Nature of the research participants	This pertains to the changing contexts of the participants, their willingness, and knowledge of the phenomenon being studied.
Access to quality data	This focuses on the amount of quality data to be collected, including access to and sources of literature and empirical data.
Expert support	This refers to the lack of expert support (e.g., research instructor, research adviser, and statistician).
Physical resources	This focuses on the lack of statistical tools, lack of funds, and inadequacy of other physical resources, such as library.

3.2. Academic writing needs of the preservice teachers

To address the second research objective which was to describe BEED students' academic writing needs, the participants were also asked to provide quantitative and qualitative data. The quantitative results on students' academic writing needs are displayed in Table 4 with items ordered from highest to lowest. The results show that the BEED students generally had a very high need with respect to all the features of academic writing examined (M=4.49, SD=0.98). A closer look at these results reveals that students' highest academic writing needs were concerning: using proper connections (i.e. coordination and subordination) (M=4.63, SD=0.79), presenting ideas objectively (M=4.59; SD=0.88), using correct punctuation and spelling (M=4.58, SD=0.87), organizing the whole text (M=4.56, SD=0.94), choosing correct words (field-related terminology) (M=4.56, SD=0.93), and presenting ideas clearly (M=4.55, SD=0.98).

Table 4. Quantitative analysis of the participants' academic writing needs

Items	Mean	SD	Interpretation
Using proper connections (i.e. coordination and subordination)	4.63	0.79	Very high
Presenting ideas objectively	4.59	0.88	Very high
Using correct punctuation and spelling	4.58	0.87	Very high
Organizing the whole text	4.56	0.94	Very high
Choosing correct words (field-related terminology)	4.56	0.93	Very high
Presenting ideas clearly	4.55	0.98	Very high
Using proper transitional devices	4.54	0.98	Very high
Using proper grammar	4.53	1.03	Very high
Organizing paragraphs	4.49	0.99	Very high
Citing sources properly within the body of a paper following certain mechanical conventions (e.g. APA style)	4.48	0.98	Very high
Listing references properly following certain mechanical conventions (e.g. APA style)	4.48	0.84	Very high
Preparing an outline before starting writing	4.46	0.99	Very high
Avoiding plagiarism (how to quote, paraphrase or cite)	4.45	1.08	Very high
Avoiding the use of personal pronouns (e.g. I or we).	4.25	1.19	Very high
Avoiding the use of contracted forms (e.g. aren't, can't, and it is)	4.24	1.21	Very high
Grand mean	4.49	0.98	Very high

The qualitative findings on the participants' academic writing needs found in Table 5 seem to agree well with the quantitative results. The participants also reported a wide range of academic writing needs which could be categorized into language use, organization, citation, and mechanics. Collectively, these results suggest that

the academic writing needs reported by preservice elementary teachers vary from micro-linguistic devices (e.g. punctuation and spelling) to macro-linguistic elements (e.g. text organization). The findings further reverberate that the students may lack necessary linguistic and rhetorical knowledge needed to perform an academic writing task. Academic writing is distinct from any other forms of writing as it entails familiarity of conventions, styles, language, and audience, given a specific area of discipline [27]. Hence, it may be indispensable that the participants master these features of academic writing to be able to write a good research report.

Table 5. Qualitative analysis of the participants' academic writing needs

Generated themes	Theme definitions
Language use	This refers to students' difficulties in using appropriate words (e.g. avoiding the use of flowery words and using simple language instead) and sentence structure. This category also involves students' lack of vocabulary.
Organization	This is concerned with paragraph organization within the text (e.g. organization in research introduction).
Citation	This involves students' difficulties mostly in using in-text citations to support their stance. Avoiding plagiarism is also part of this category.
Mechanics	This pertains to students' difficulties in using proper punctuations and spelling.
Writing process	This refers to the different processes involved in writing a research article (e.g., generate ideas, write a good research title, invest time planning to write, choosing a good research topic, being sensitive to readers, and establish connection to readers).

Interestingly, from the qualitative and quantitative analysis, the participants also reported needs on the writing processes, which Truong and Tran [28] consider as higher-order self-regulated thinking skills. These needs encompass several activities involved when performing an academic writing task, such as investing time planning to write, generating ideas, preparing an outline, being sensitive to readers, among others. Planning may be an essential stage in writing since it allows the writers to brainstorm and conceptualize ideas. Hence, allowing students an ample time to plan their writing tasks could be vital for generating a useful content and preparing a well-organized outline. In addition, being sensitive to readers is a much-expected skill in academic writing because a writer has to think of his audience as an imagined reader who may formulate a reasoned response [29]. Tribble [30] calls this as writer's context knowledge in which the writer should develop a deep understanding about where the text will be read.

Previous works across different higher education contexts corroborate the study's findings on students' academic writing needs. For example, Padagas and Hajan [31] reported a wide range of academic writing needs of nursing students which included correct usage and grammar and adherence to an academic writing style. A study by Gagalang [32] also revealed preponderant grammatical errors, less knowledge of mechanics, and lack of English vocabulary as academic writing problems of college freshmen students.

In the context of preservice teacher education, several studies have also reported similar findings. Nur [16] discovered that while students perceived the importance of essay elements and academic work such as outlining, paraphrasing and producing complete academic writing, they faced problems in developing ideas, grammar, vocabulary, and language expressions. In addition, Sulaiman and Muhajir [17] study which examined the difficulties of English education students in writing scientific work indicated that students faced a variety of academic writing difficulties which included grammar, scientific writing style, vocabulary, spelling and coherence, writing arrangement, and punctuation. Three common errors were found such as spelling, use of capital letters, and punctuations. Furthermore, Thao and Quyên [18] showed that the students encountered a multitude of academic writing difficulties, of which the most common difficulties faced were organization and use of grammar and punctuation/capitalization.

The study offers several pedagogical implications useful for teachers handling a research writing course, especially in the context of teacher education programs. There is clearly a need to strengthen the teaching of advanced research techniques and processes for preservice elementary teachers so that they could be more equipped to conduct research projects independently. It should be noted that these students had undertaken already research courses in their senior high school; hence, they should be recalibrated with respect to the real-world application of an undergraduate research course, that is, to take it not only as part of the degree requirements but more importantly as a means to capacitate themselves to conduct quality research that is useful for their personal and professional development. Students should also be made more aware of their roles as researchers. With this in mind, they should be given more exposure to do research activities that will require them to delineate their personal attributes from those of professional researchers. Field exposure may also help them to become more attuned to the varying nature and context of research participants.

Additionally, with the limited resources, students should be taught various ways on how to gain access to freely available academic and professional literature. It is important to note that the quality of students' research outputs may depend on their access to literature. Furthermore, while it is true that the number of research experts in state universities like the one studied in this research may be insufficient, certain mechanisms may be adopted by research instructors to ensure that students still get the most expert support they need to be guided properly in implementing a useful research project. For example, students who have

advanced knowledge of research may work collaboratively as "buddy" of those who may need more methodological support, and those who will have improved as a process of this mentoring may serve as peer mentors to those needing more support [33].

Academic writing skills are as important as research skills for preservice teachers. Given the many academic writing courses that students may have taken since their senior high school, it seems very crucial that genre knowledge may be necessary for them to develop effective academic writing skills for research purposes. Hence, genre-based approach to writing pedagogy may be adopted by English language instructors to raise students' consciousness on the micro and macro features of academic writing required by their discourse community. The importance of process approach cannot also be undervalued since clearly the students also needed support in terms of the writing processes. Thus, an amalgamation of genre-based approach and process approach to teaching writing may serve its purpose of improving preservice elementary teachers' academic writing skills.

4. CONCLUSION

This study has investigated the research and academic writing needs of preservice elementary teachers at a state university in a Philippine rural area. Based on the findings of the study, it can be concluded that the students manifest a multitude of research and academic writing needs. In terms of research, the students' needs vary from research methodology to other relevant aspects such as physical resources, expert support, researcher's personalities, nature of research participants, and quality data. As with academic writing, the students' needs differ from the micro linguistic elements needed in academic writing such as mechanics and punctuation and grammar and language use to the macro linguistic aspects such as organization. Apart from the language elements, the students also need support in terms of the writing processes. Despite these conclusions, it should be borne in mind that the research and academic writing needs reported in this research are only students' self-reports. Students' research outputs were not part of the analysis. In addition, data were limited to structured surveys and semi-structured interviews gathered through an online platform. Hence, a number of recommendations are forwarded to address the limitations of the present work. First, future research may employ a triangulation method using students' research reports to explore their research and academic writing needs. Participant triangulation where teachers are part of the study may also be undertaken. Second, a semi-structured or unstructured type of data collection such as focus group discussion or key informant interview may be exploited by future researchers to provide a richer and deeper account of students' research and academic writing needs. Third, future research may want to focus only on students enrolled in a research course.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Bonjovi Hassan Hajan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	
Abubakar Jaddal Radjuni	✓	✓			✓	✓		✓		✓	✓		✓	
Alhisan Utoh-asim Jemsy			✓	✓	✓		✓	✓		✓		✓		

C : **C**onceptualization	I : **I**nvestigation	Vi : **Vi**sualization
M : **M**ethodology	R : **R**esources	Su : **Su**pervision
So : **So**ftware	D : **D**ata Curation	P : **P**roject administration
Va : **Va**lidation	O : Writing - **O**riginal Draft	Fu : **Fu**nding acquisition
Fo : **Fo**rmal analysis	E : Writing - Review & **E**diting	

CONFLICT OF INTEREST STATEMENT
Authors state no conflict of interest.

INFORMED CONSENT
Authors have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL
The research related to human use has been complied with all the relevant national regulations and institutional policies in accordance with the tenets of the Helsinki Declaration.

DATA AVAILABILITY
The data that support the findings of this study are available from the corresponding author [BHH], upon reasonable request.

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BIOGRAPHIES OF AUTHORS

Bonjovi Hassan Hajan ⓘ 🅖 ⓢⓒ 🗘 is an associate professor at the College of Education of Mindanao State University–Tawi-Tawi College of Technology and Oceanography, Philippines. He holds a Master of Arts in Education with Specialization in English Language Teaching from the Philippine Normal University, Manila, Philippines. His research interest focuses on teacher research, language and literacy education, and second language writing. He can be contacted at email: bonjovihajan@msutawi-tawi.edu.ph.

Abubakar Jaddal Radjuni ⓘ 🅖 ⓢⓒ 🗘 currently holds the position of Instructor in the College of Education and Senior High School, as well as the Faculty of the Graduate School, at Mindanao State University-Sulu, Philippines. He holds a Master of Arts in Education with a major in Educational Administration in 2020. He is currently pursuing a Doctor of Philosophy with a major in Educational Management at MSU-Sulu. He has presented a paper at an international conference hosted by the University of Science and Technology of the Philippines in Cagayan de Oro City, Philippines. He can be contacted at email: abubakarradjuni@msusulu.edu.ph.

Alhisan Utoh-asim Jemsy ⓘ 🅖 ⓢⓒ 🗘 is a professor at the College of Education of Mindanao State University Tawi-Tawi College of Technology and Oceanography, Philippines. He finished his Doctor of Philosophy in Education with a major in Research and Evaluation from the University of San Carlos, Cebu City, Philippines. His research interest inclines toward educational research, research instrumentation, evaluation research, and pedagogical research. He can be contacted at email: alhisanjemsy@msutawi-tawi.edu.ph.