

Utilization of Filipino Sign Language-Sight Words Intervention (FSL-SWI) to Increase the Literacy Skills of Deaf and Hard-of-Hearing (DHH) Pupils

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Abstract: Young readers will find it easier to read words by sight or memory if they have a large vocabulary of sight words that they are familiar with from earlier literature. Deaf and hard-of-hearing (DHH) learners have distinct learning qualities, which might make reading challenging for them. Their main form of communication is sign language because of their propensity for visual learning. The majority of Filipino DHH learners encounter difficulties in comprehending Filipino-written vocabularies. Results from the Phil-IRI screening tests conducted on pupils in grades 4, 5, and 6 show that they fall under the Frustration Level. This study's overarching goal is to use an intervention known as Filipino Sign Language-Sight Words Intervention (FSL-SWI) to alleviate the difficulties DHH learners have learning Filipino-written words. Multimedia educational resources that are available on all Android and iOS devices served as the intervention. A mixed method technique was employed in the study to gather both quantitative and qualitative data. Pre- and post-tests were administered to 89 students in grades 4, 5, and 6 who participated as student participants to collect quantitative data. The application of FSL-SWI is a powerful and effective multimedia learning intervention that can help DHH learners expand their vocabulary in Filipino, as indicated by the considerable rise in mean percentage score observed in the pre and post-test results. The posttest results yielded to the independent reading level, indicating that following the intervention, the learners are proficient in using sign language to function independently and comprehend information well. Qualitative data, on the other hand, was collected through survey forms and focus group interview to some selected stakeholders. The focus group interview produced three themes for this study, namely, Filipino sign language variation, sign language training to parents/guardians, and easy access to multimedia. All stakeholders gave the FSL-SWI a good agreement rating overall. FSL-SWI is strongly advised to be used as an intervention to help the students in grades 4, 5, and 6 expand their Filipino vocabulary, according to feedback and evaluation.

Keywords: sight words, deaf and hard-of-hearing education, Filipino Sign Language, multimedia.

1. INTRODUCTION

Without a doubt, one of the most crucial life skills that young children acquire is reading. It's common for elementary school pupils to be required to read simple materials by the time they enter the second grade. Sight words, also known as high-frequency words, are frequently encountered in texts and can be utilized to improve learning. The ability to learn a broad vocabulary of sight words will facilitate young readers to be able to read words that they already know or that they have encountered in previous texts by memory or sight [1]. Children who are learning to read are instructed to develop their phonics abilities as well as their phonemic awareness and their ability to learn written language as well as sight words so they can become adequate readers [2]. Reading becomes effortless through sight word recognition [3] as readers

will no longer have to pause and try to figure out unfamiliar words, which can cause them to lose focus and reduce their ability to comprehend a text [1].

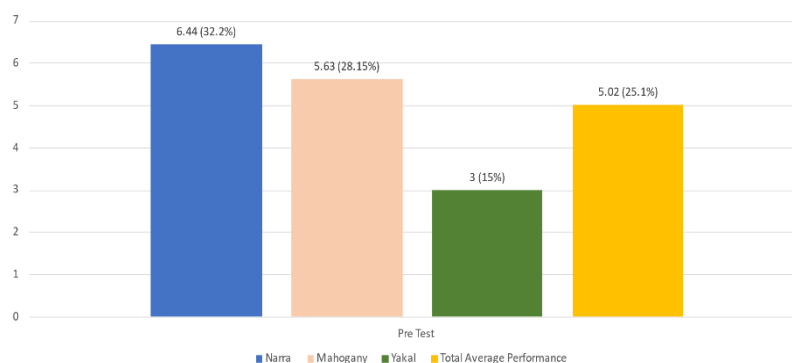
Deaf and hard-of-hearing (DHH) learners have distinct learning qualities, which might make reading challenging for them. Sign language serves as their major form of communication because of their propensity for visual learning. The literacy development of these children is significantly lower than the literacy development of their peers with typical hearing ages alike [4]. There are two broad components to the reading challenges faced by DHH students - the challenge of accessing phonology, and the challenge of recognizing the differences between the structure of a written language and the structure of a signed language [5]. It is observed that children who use spoken language and who have hearing loss lag their peers with normal hearing in terms of the development of phonological awareness, which is related to the development of literacy [6]. A child with hearing loss is also more likely to be delayed in vocabulary development than a child with normal hearing; receptive and expressive lexicons are smaller for children with hearing loss as well as word learning skills are affected [7]. There is some preliminary evidence that children with hearing loss may have a relative advantage when it comes to acquiring print knowledge, based on results from two studies [8]. This study, however, was primarily focused on alphabet knowledge, as opposed to a more comprehensive understanding of print. It was argued by Werfel [6], and Lund [7] that this conclusion was contrary to reality. When it came to alphabet knowledge, preschoolers with hearing loss performed on par with, or sometimes even better than, their classmates with normal hearing. In comparison to their peers, children with hearing impairments demonstrated significantly poorer conceptual print knowledge scores. It can therefore be argued that conceptual print knowledge is one of the areas where children with hearing loss have a significant deficit [6].

A study conducted by Madronio [9] reveals the essence of the content, layout, and accessibility in making educational interventions to help DHH learners improve their Filipino written vocabulary. To determine whether children at certain grade levels can read texts at an age-appropriate level, the Philippine Informal Reading Inventory (Phil-IRI) is used as a tool by the Philippine Department of Education to assess their reading abilities [10] and to aid in identifying the interventions needed by learners. It is important to understand, however, that the Phil-IRI manual [11] is specifically developed for regular and hearing learners. The school year 2022-2023 is the pilot year of the Philippine School for the Deaf (PSD) to utilize Phil-IRI in Filipino Language.

Results from the Phil-IRI screening tests conducted to pupils in grades 4, 5 and 6 show that they fall under the Frustration Level. The majority of the learners scored below 14 and need reading intervention in Filipino.

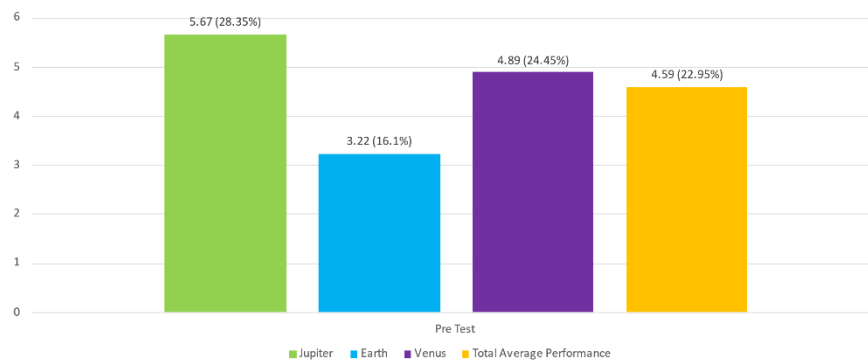
The grade 4 performance level in the Phil-IRI screening test results for the 2022–2023 academic year is shown in Figure 1. Section Narra, Mahogany, and Yakal got a mean percentage score of 32.2%, 28.15%, and 15%, respectively with a total average performance of 25.1% that falls under the frustration category of reading.

Figure 1. Grade 4 Phil-IRI Screening Test Results



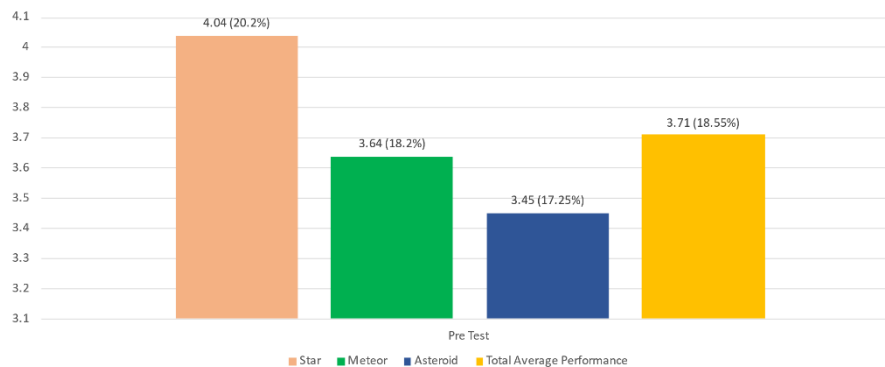
(School Year 2022-2023)

The result of the screening tests of learners in grade 5 is presented in Figure 2. They also consist of three (3) sections namely, Jupiter, Earth and Venus that have mean percentage scores of 28.35%, 16.1 % and 24.45%, respectively. The total average performance of this grade level is 22.95% which also falls under the frustration level of reading.

Figure 2. Grade 5 Phil-IRI Screening Test Results

(School Year 2022-2023)

The grade 6 performance level on the Phil-IRI screening test for that same academic year is summarized in Figure 3. Like the previous grade levels, it's also composed of 3 sections, Star, Meteor, and Asteroid. MPS of these sections were 20.2%, 18.2%, and 17.25%, respectively with a total average performance of 18.55% which also falls under the frustration category of reading.

Figure 3. Grade 6 Phil-IRI Screening Test Results

(School Year 2022-2023)

The data shown above is proof that the written Filipino language is foreign to most Filipino DHH learners. This study's main goal is to offer a suitable intervention that will raise DHH students' literacy levels in terms of Filipino vocabulary. Specifically, the study aims to utilize the Filipino Sign Language Sight Words Intervention (FSL-SWI) through multimedia presentations to increase their vocabulary in Filipino words.

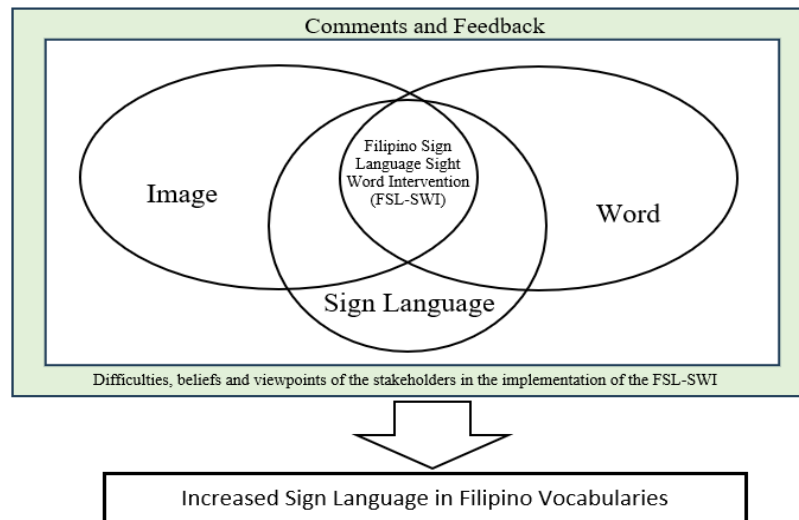
1.1 Conceptual Framework

Considering that the Phil-IRI was designed for regular and hearing learners and the results of the screening tests of grades 4, 5 and 6 fell under the frustration category, the special education teachers, who teach Filipino subject, at the Philippine School for the Deaf (PSD) need to find an appropriate intervention to address these literacy challenges.

Through the use of the Filipino sight word intervention, students engage in an active learning process that helps them to mimic the sign language they observe in multimedia presentations and comprehend the meaning of the word. Figure 4 shows the conceptual framework of the study. The primary features of the intervention are the image, word, and sign

language execution. The image exhibits the meaning of the word presented. The written text is expected to strengthen the learner's vocabulary in Filipino.

Figure 4. The Conceptual Framework of the Study



The sign language serves as the means of manual reading the text. The FSL-SWI is enclosed in a box that depicts the feedback, comments, and suggestions from the selected stakeholders. The study aims to help DHH learners increase their vocabulary in Filipino language.

2. RESEARCH QUESTIONS

- 2.1 What was the DHH learners' level of Filipino vocabulary in grades 4, 5, and 6 prior to using FSL-SWI?
- 2.2 What is the Filipino vocabulary level of DHH learners in grades 4, 5, and 6 after utilizing the FSL-SWI?
- 2.3 What are the difficulties, beliefs, and viewpoints of the stakeholders in the implementation of FSL-SWI?

HYPOTHESIS (Ho)

There is no significant difference in the mean percentage scores of the grades 4, 5, and 6 pupils before and after the utilization of the FSL-SWI intervention in increasing the pupils' sign language skills in Filipino sight words.

3. METHODOLOGY

A combination of methodologies were used in this study project. A quantitative and qualitative data collection process was used in the aforementioned design [12]. Participants' pre- and post-test results were analyzed using quantitative research methods. On the other hand, the qualitative portion was used to collect viewpoints, insights, and opinions from a limited number of stakeholders using surveys and semi-structured interviews.

3.1 Population and samples. The participants of the study were pupils from grades 4, 5, and 6 enrolled in the pioneer government-owned sign language institution that offers basic education in the Philippines, for the school year 2022-2023. The gender breakdown of participants is displayed in Table 1. 51 or 57% were males and 38 or 43% were females.

Table 1. Distribution Participants According to Gender

Gender	Grade 4	Grade 5	Grade 6	Frequency	Percentage
Male	12	18	21	51	57%
Female	14	13	11	38	43%
Total	26	31	32	89	100%

The predominance of male participants is evident in this research study. For the academic year 2022–2023, the participation percentage is 100%, which reflects the whole PSD upper-grade population.

Table 2. Profile of the Participants in the Evaluation of the FSL-SWI Intervention

Participants	Age	Gender	Profession	Hearing Ability/Loss
A	13	Male	Pupil	Profound
B	36	Female	Parent	Regular Hearing
C	33	Female	Deaf teacher	Profound
D	58	Female	Teacher	Regular Hearing

Table 2 summarizes the profile of the stakeholder participants who participated in the interview and focus group discussion. It presents their age, profession, and hearing ability/loss. To reflect the various stakeholders, including students, parents, teachers, and the Deaf community, a purposeful sample technique was applied.

3.2 Research Instrument

The FSL-SWI Vocabulary Form, a 50-item list including columns for Filipino vocabulary, a pre-test, a post-test, and a remarks column, was the validated evaluation tool used in the study to gather quantitative data. Most of the items were taken from the stories in the Phil-IRI manual. Some vocabularies were carefully selected by the Filipino teachers themselves.

Sign language is executed twice. The Filipino vocabulary is presented first, then fingerspelling, another manual sign language, images, and another manual sign language. Each slide presentation contains Filipino-written word, an image, and the manual sign language. The study adapted the "Reading Level Proficiency Rubric" of the Philippine Informal Reading Inventory (Phil-IRI) to measure and describe the level of vocabulary of the pupils [11]. Scores of the participants were recorded in Level of Vocabulary Competency Form to ascertain the extent of their Filipino vocabulary proficiency. It has scale rated as follows: 0-15, Frustration Reading Level, which means that the learner finds the FSL-SWI so difficult that they cannot successfully respond to them [13]; 16-35, Instructional Reading Level, which means that the learner profits the most from teacher directed instruction in Filipino vocabularies; and 36-50, at the Independent Reading Level, students are able to read and comprehend nearly flawlessly on their own using manual sign language.

To evaluate the intervention's overall impression and applicability in terms of content, layout, and accessibility features, qualitative data were gathered for this study using the FSL-SWI Feedback Form. It is a five-point Likert scale, and the answers are indicated by ticking the box next to the number that represents the assessors' answers. The following ratings were given to the criteria on the aforementioned scale: 5-Strongly Agree, 4-Agree, 3-Neutral, 2-Disagree, and 1-Strongly Disagree. The weighted means were interpreted using the same arbitrary scale. Additionally, it has a comments section where stakeholders can provide specific feedback and suggestions. In order to ascertain the obstacles, viewpoints, and opinions of the stakeholders about the FSL-SWI, focus group interviews were also held.

3.3 Data Analysis

Additionally, the collected data was examined using the subsequent statistical instruments:

3.3.1 Mean. When the data were divided into groups before and after the FSL-SWI, the mean was used to determine the scores of the DHH students in grades 4, 5, and 6.

3.3.2 Paired Sample T-Test. The outcomes or mean scores from the pre-and post-test were compared using the Paired Sample T-Test.

3.3.3 Thematic Analysis. The focus group interviews yielded specific themes that were identified through the application of thematic analysis.

4. RESULTS AND DISCUSSION

The following findings from a study on increasing the vocabulary of DHH learners in grades 4, 5, and 6 with FSL-SWI intervention are reported in accordance with the previously stated research goals:

4.1 To ascertain the difference between the learners' levels of Filipino vocabulary in grades 4, 5, and 6 before and after completing the intervention program, data were painstakingly recorded, tabulated, and assessed using a paired sample t-test. To make it simple to identify variations, the data is provided in tabular form. The pre-and post-test findings of the 89 participants in the researcher's 50-item test, administered both before and after the use of the FSL-SWI, are displayed in Table 3.

Table 3. Mean Percentage Scores (MPS) of Pre-Test and Post-Test

Grade Level	No. of Items	No. of Pupils	PRE-TEST MPS	POST-TEST MPS	Difference
4	50	26	10	83.23	73.23
5	50	31	8	80	72
6	50	32	14	82	68

The grade 4 pupils acquired an MPS of 10 in their pre-test and 83.23 for their post-test result. Learners of grade 5 scored 8 MPS on their pre-test and 80 MPS on the post-test. The grade 6 pupils got 14 and 82 MPS in their pre and post-test, respectively. Table 3 makes it abundantly evident that, following the use of the FSL-SWI, participants' MPS of the pre-test increased significantly, with differences of 73.23 (grade 4), 72 (grade 5), and 68 (grade 6). This is a noteworthy indication that using FSL-SWI is a powerful and successful learning material intervention to help DHH learners expand their vocabulary in Filipino. The total level of Filipino vocabulary attained by the students in the upper grades is displayed in Table 4.

Table 4. Level of AP Vocabulary

Grade Level	AVERAGE PRETEST RESULTS	*Proficiency Scale	AVERAGE POST-TEST RESULTS	*Proficiency Scale
4	5.31	Frustration Reading Level	44.88	Independent Reading Level
5	4.90	Frustration Reading Level	42.64	Independent Reading Level
6	4.66	Frustration Reading Level	41.71	Independent Reading Level

* The Reading Level Proficiency Rubric of Phil-IRI served as the basis for the Proficiency Scale.

Every student in the upper grades who took the pre-test had reading levels below the frustration threshold. This indicates that the learners found the Filipino vocabulary so challenging that they were unable to properly reply to it before the FSL-SWI was implemented. The average post-test scores, which are in the independent reading level, showed that the FSL-SWI had a good influence. Grade 4 obtained the highest post-test result, 44.88, followed by Grade 5 at 42.64 and Grade 6 at 41.71. This indicates that following the intervention, the upper-grade learners are able to function independently and have high comprehension when using sign language. It was also noted that the learners sign along with the multimedia intervention's content, which is similar to reading the words aloud. The intervention program called Filipino Sign Language- Sight Word Intervention (FSL-SWI) is a very effective intervention in improving the Filipino vocabulary of DHH learners.

4.2 The t-test's outcome for identifying a significant difference between the pre-and post-test findings is displayed in Table 5.

Table 5. T-Test Result on Finding the Significant Difference in the Means of the Grades 4, 5, and 6 Pupils Before and After the Utilization of the FSL-SWI

Variables Compared	DF	MPS	Computed t-value	Critical t-value	Decision	Impression @ 0.05 Level
Grade 4						
Pre-Test (X_1)	25	10.61	33.93	1.70	Reject H_0	Significant
Post-Test (X_2)		89.77				
Grade 5						
Pre-Test (X_1)	30	9.81	30.56	1.69	Reject H_0	Significant
Post-Test (X_2)		85.29				
Grade 6						
Pre-Test (X_1)	31	9.31	24.64	1.69	Reject H_0	Significant
Post-Test (X_2)		83.43				

The researchers rejected the null hypothesis, which is significant at the 0.05 level, based on the data collected from the grade 4 students, which yielded a computed t-value of 33.93 and a critical level of 1.70. The researchers rejected the null hypothesis, which is significant at the 0.05 level, based on the grade 5 participants' computed t-value of 30.56 and critical t-value of 1.69. With the learners' grade 6 data, the researchers rejected the null hypothesis, which is significant at the 0.05 level, with a computed t-value of 24.64 and a critical t-value of 1.69. The impressive increase in the mean following the use of FSL-SWI suggests that there was a very notable improvement in the Filipino vocabulary of students in grades 4, 5, and 6.

4.3 The difficulties, beliefs, and viewpoints of the FSL-SWI stakeholders are listed in Table 6. It received a score of 4.59 and was interpreted as strongly agreeable. This clearly indicates that FSL-SWI should be utilized as an intervention to assist students in grades 4, 5, and 6 in expanding their Filipino vocabulary.

Table 6. FSL-SWI Feedback and Evaluation Form

Criteria	Stakeholders				WM	INT
	1	2	3	4		
<i>The contents of FSL-SWI are ...</i>						
1. accurate and are based on the Most Essential Learning Competency (MELC) Self Learning Modules of DepEd	4	4	4	5	4.25	Agree
2. current and are based on the Most Essential Learning Competency (MELC) Self Learning Modules of DepEd	4	4	4	5	4.25	Agree
3. suited for the deaf and hard-of-hearing (DHH) learners	5	5	5	5	5	Strongly Agree
4. level appropriate to the grades 4, 5, and 6 DHH learners	4	5	5	4	4.5	Strongly Agree
<i>The layout ...</i>						
5. makes it easy for the DHH learners to process graphics, text and sign language	3	5	4	5	4.25	Agree
6. of the FSL-SWI intervention is consistent	4	4	5	5	4.5	Strongly Agree
7. is clear and logical	4	5	4	5	4.5	Strongly Agree
8. words and subtitles are clearly visible	5	5	5	5	5	Strongly Agree
<i>Accessibility...</i>						
9. The FSL-SWI intervention accommodates the unique learning style of DHH pupils	4	5	4	5	4.5	Strongly Agree
10. The FSL-SWI intervention can be utilized by the DHH learners without much help from the teacher.	4	5	5	5	4.75	Strongly Agree
11. The FSL-SWI intervention can be accessed in any type of computer	5	5	5	5	5	Strongly Agree
Total:					4.59	Strongly Agree

Legend: WM – Weighted Mean; INT – Interpretation

The focus group interview produced three themes that were found in this study. These are:

4.3.1 Filipino Sign Language Variation. The selected stakeholders pointed out the importance of having awareness of the different variations of Filipino Sign Language. Noteworthy to mention, for the Deaf community, there is no universal sign language to bind its members [14]. Madronio [15] mentioned that sign variation is inevitable in the Philippines due to its geographical features. Hence, both spoken and sign languages naturally exhibit variation, which is an essential component of any linguistic study. Like spoken languages, sign languages exhibit significant sociolinguistic variance. Region, age, gender, education, family history, social status, ethnicity, register, and linguistic differences can all contribute to this diversity [16]. Some vocabularies (*anak, baboy, lagi, wala*) included in the FSL-SWI need to include sign variations in FSL for early awareness of the individual who utilizes the intervention.

4.3.2 Sign Language Training to Parents/Guardians. Most of the selected stakeholders believe that learning sign language is not only applicable to the enrolled learners in school but also to the parents and guardians. They unanimously agree that intensive sign language training is essential to attain efficient and effective communication with their deaf children. Hence, literature shows that most researchers in the field of sign language education, believe that the Deaf community's

expertise and experience are infused into every facet of a successful sign language instruction because they are crucial language and cultural role models [18] [19] [20]. Parents must first learn sign language, sometimes concurrently with their child, in order for the child to start using it. The child's ability to access language will grow along with the parents' fluency. Instantaneous and encouraging information regarding learning sign language and establishing social networks is extremely important for families and caregivers, as it greatly shapes the attitudes that these individuals have toward deafness and, in turn, the linguistic plans that they undertake [21].

4.3.3 Easy Access to Multimedia. Many of the stakeholder participants find it easy to utilize FSL-SWI multimedia. Watching this several times helps them retain the manual sign language of a particular Filipino vocabulary. Moreover, they believe that this kind of innovation is very important and can be emulated in other learning areas. This multimedia definitely helps the DHH learners to focus better and to improve their understanding of written vocabularies [22].

5. SUMMARY AND CONCLUSIONS

Based on the results and discussions drawn from this study, the following are the conclusions and recommendations made by the teacher-researchers:

5.1 Based on the findings of the pre- and posttests, it was clear that the FSL-SWI was successfully implemented with DHH learners in grades 4, 5, and 6. After using FSL-SWI, the mean significantly increased, indicating that the Filipino vocabulary of students in grades 4, 5, and 6 significantly improved.

5.2 It was also noted that the students sign along with the multimedia intervention's content, which is similar to reading the words aloud. The intervention program called Filipino Sign Language- Sight Word Intervention (FSL-SWI) is very effective intervention in improving the Filipino vocabulary of DHH learners.

5.3 The FSL-SWI evaluation and feedback from the chosen stakeholders reveals a Strongly Agree rating of 4.59, indicating that FSL-SWI should be utilized as an intervention to help students in grades 4, 5, and 6 expand their Filipino vocabulary.

5.4 The result of focus group interview reveals the importance of Filipino sign language (FSL) variations, FSL trainings to parents and/or guardians, and easy access to multimedia as contributing factors in the enhancement of the learners sign language and written vocabularies.

5.5 In order to help DHH learners expand their vocabulary in the Filipino learning area, it is advised that they utilize the established FSL-SWI intervention as instructional resources.

5.6 The FSL-SWI intervention can potentially be extended to other learning domains in order to support the development of deaf and hard-of-hearing learners' written vocabulary.

5.7 To overcome the observed shortcomings of this study, more comparable research might be conducted.

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