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From Sense to Sounds: Design and Effectiveness of 3-In-1 Toolkit Flashcards in Enhancing Key Stage 1 Learners' Phonological Awareness

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ABSTRACT

The perennial reading problem among early learners in the Philippines is a very alarming situation, as a large number of children are not able to develop their foundational reading skills necessary for lifelong learning and academic success. This study sought to design and determine the effectiveness of the 3-in-1 Phonological Toolkit Flashcards in enhancing phonological awareness among fifty-eight (58) Key Stage 1 learners (Grades 1-3) in a private archdiocesan school in the Municipality of Lasam, Cagayan, Philippines. Using a Mixed Methods Research Design and following the ADDIE Model (Analysis, Design, Development, Implementation, and Evaluation), this study systematically developed and improved the phonological toolkit. The findings showed significant improvements in phonological skills and favorable changes in learner attitudes at all levels. The multisensory and scaffolding approach was highly effective in catering to the diverse developmental needs, thereby triggering motivation and literacy engagement. The teacher feedback was supportive of the toolkit's relevance, usability, and appeal in low-resource settings, with suggestions to improve audio integration, digital components, and dialect adaptation for better accessibility and cultural responsiveness. Although the results are constrained by limitations in sample size, setting, and intervention duration, the results are promising and shed light on the imperative need to address the reading crisis by incorporating effective and developmentally appropriate phonological interventions like the toolkit into the classroom and preservice teacher education, ultimately contributing to the development of effective literacy policies. Further research is recommended to confirm these results. The 3-in-1 Toolkit Flashcards developed in this study offer a novel, cost-efficient, and evidence-based solution for enhancing foundational literacy skills in early-grade children.

Keywords: *Phonological Awareness, Multisensory Toolkit, Early Literacy Intervention, Key Stage 1 Learners*

INTRODUCTION

Students in early grades around the world continue to experience challenges in mastering phonological awareness, a fundamental skill that is essential for effective reading achievement. Phonological awareness is the ability to identify and manipulate the sounds in spoken words. It is a foundation skill for decoding and comprehension skills. Nevertheless, many students, especially in developing nations, do not have the opportunity to learn phonics effectively, which is a barrier to them acquiring these fundamental skills. UNESCO (2022) reported that over 56% of 10-year-old children in developing nations have difficulty reading and comprehending a simple text, which underscores the gaps in early literacy education that are contributing to this global problem.

The Philippines faces this problem even more. According to the 2022 World Bank report (Azevedo et al, 2022), the learning poverty rate in the Philippines is a staggering 91%, meaning that nine out of ten children aged 10 cannot meet the basic reading comprehension skills. The high learning poverty rate is directly related to the poor development of phonological awareness skills in the early years of schooling. If the early years of schooling do not provide a solid foundation in literacy skills, it will be difficult for Filipino children to read fluently and perform well in school, which will have a long-term effect on their educational and socio-economic outcomes (Garcia, 2023, Magulod, 2018 Niala, 2024. Villanueva, 2022).

Why Phonological Instruction Matters?

Phonological awareness is considered a very important precursor for effective reading development and is recognized as the building block of decoding words and developing a fluent reading skill. Phonological awareness is the ability to identify and manipulate the sounds in spoken words, which helps learners associate sounds with letters, a critical task for decoding unknown words (Gibels et al, 2024). Studies carried out by National Reading Panel (2000) highlight that direct phonological instruction in the early grades of schooling has a profoundly positive effect on children's reading accuracy, fluency, and comprehension. The early intervention stage in Grades 1 to 3 is especially critical since the early years of schooling constitute a critical period during which children's cognitive and sensory skills are maximally responsive to learning new language skills (Stekc, Kovic & Savic, 2023, Parry, Kumar & Gallingane, 2024, Lonigan, 2006). In addition, multisensory phonological training has been demonstrated to improve engagement and retention of young students. Learning strategies that utilize visual, auditory, and kinesthetic modalities are effective in catering to different learning styles and levels of development (Gassid, 2023, Magulod, 2017, Llaneza & Magulod, 2023). The increased sensory sensitivity during early childhood enables the design of learning experiences that can more effectively meet the needs of students at varying levels of phonological training mastery. This finding highlights the need for developmentally appropriate and culturally valid phonological training to ensure its effectiveness. Early phonological training not only improves decoding abilities but also cultivates motivation and confidence, which are critical for long-term academic success.

Theoretical Grounding

Theories that form the basis of this research are mainly rooted in Vygotsky's (1978) socio-cultural theory and self-determination theory as proposed by Deci and Ryan (1985). Vygotsky's theory mainly focuses on the importance of social interactions in cognitive development, implying that learners will be able to develop new skills in an optimal manner when supported to perform tasks slightly beyond their reach. This is reflected in the design of the 3-in-1 Phonological Toolkit Flashcards, which are designed to offer scaffolded, multisensory activities that are appropriate for the developmental level of early learners, allowing them to develop phonological awareness skills in a step-by-step manner. In addition to this, the self-determination theory by Deci and Ryan (1985) mainly

emphasizes the importance of intrinsic motivation, autonomy, and interest in the learning process. The interactive and motivational aspects of the toolkit are designed to promote the learner's interest and confidence, which is crucial for their efforts and attitudes towards reading tasks.

Research Literature Gap

Studies on phonological awareness have found its importance in the early stages of reading acquisition, especially in students of Grades 1 to 3 (Ehri, 2014; National Reading Panel, 2000; Porta & Ramirez, 2020). Many studies have shown that phonological interventions are effective in improving rhyming, blending, and segmenting skills, which are basic for decoding and fluency (Bdeir, Bahous & Nabhani, 2022; Gonzales-Frey, 2020; Dossemontet et al, 2021). Nevertheless, most of these studies were conducted on students in high-income or urban areas, which creates a need for studies on students in low-income or rural areas, especially in developing countries such as the Philippines, where the effectiveness of phonological interventions is unknown. The need for studies that specifically target the challenges of students in under-resourced schools, where access to high-quality phonics-based materials and teachers may be scarce, is thus emphasized. From a contextual perspective, there is a dearth of studies on phonological awareness tools that are culturally and linguistically responsive to the local context. Most of the existing interventions are based on generic or English-only materials that are not sensitive to multilingual learners or local dialects, which makes them less relevant and engaging (Yang, McBride & Cheing, 2022). Moreover, although socio-cultural and motivational theories form the basis of most literacy studies, there is a theoretical gap in the application of these theories to phonological interventions in particular, in diverse classroom settings. There is a lack of studies that have combined scaffolding techniques with motivational approaches to comprehensively cover both cognitive and affective aspects of early literacy development. This is a critical gap that highlights the need for the development and validation of instructional materials such as the 3-in-1 Toolkit Flashcards that are multisensory, scaffolded, and culturally responsive.

In the Philippine education context, Key Stage 1 learners comprise students in Grades 1 to 3, as outlined in the K to 12 Basic Education Curriculum. These students, aged 6 to 8 years old, are in the foundational stage of education, during which the development of basic literacy, numeracy, and oral language skills is prioritized. Teaching at this stage is done using the Mother Tongue-Based Multilingual Education (MTB-MLE) method to enhance understanding and expression. This stage is critical since the gaps in learning that occur at this level are likely to be retained at the higher grade levels if not remedied. Hence, it is important to provide interventions in phonological awareness, reading fluency, and comprehension to ensure that students have acquired basic skills before progressing to more complex academic tasks.

Table 1. Actual Problem Gap Analysis

What Should Be?	What Is Actual?	Gap Identified
All 58 Key Stage 1 pupils are expected to be independent readers.	Only 35 pupils can read independently.	A notable number of pupils (23) are still developing reading skills, indicating room for targeted support.
Manipulative flashcards are used to enhance phonological awareness.	Only books are used in reading sessions and teaching.	Manipulative flashcards are currently not utilized, suggesting an opportunity to enrich phonological instruction.
Visually appealing and engaging instructional materials (flashcards) with rewards are used to support phonological skills (sound-letter recognition, syllable segmentation, word recognition).	Only books without visual images are used.	There is potential to introduce more engaging materials to further support phonological skill development.

Analysis if the Problem in the Classroom Context (Gap Analysis)

A gap analysis (Table 1) was carried out by the researcher at San Lorenzo Ruiz Educational Institute, where the

researcher was posted for practice teaching, and it was found that there are considerable gaps between the expected and actual reading levels of Key Stage 1 children. Although all 58 children were expected to be independent readers as per the criteria of the diagnostic test, only 35 children could read independently, of whom 10 were frustrated readers and 13 were at the instructional level. This shows that a considerable number of children (23) are still in the process of developing their reading skills. The analysis showed that there is a substantial lack of manipulative flashcards and other engaging learning materials that are known to improve phonological awareness. At present, the reading program is conducted solely using books without any visual or interactive elements, leading to a shortage of learning materials that focus on critical skills such as sound-letter correspondence, syllable segmentation, and word recognition. The use of manipulative flashcards is not currently in use, which suggests there is potential for improvement in phonological instruction. As this is a private school, improving teaching tools is a great opportunity to capitalize on the strong foundation already established.

The absence of interesting learning materials for phonological awareness is still a major impediment to successful early literacy skills. Studies have indicated that multisensory and visually interesting learning materials, such as flashcards and manipulatives, are essential for young students to understand basic concepts of reading, including sound-letter correspondence and syllable segmentation (Ehri et al., 2001; National Reading Panel, 2000). Without these materials, students would find it difficult to stay motivated and engaged during reading lessons.

Moreover, inconsistent mastery of foundational reading skills among early learners is a widespread challenge, particularly in contexts where instructional resources are limited. Studies highlight that early intervention with appropriate teaching tools is essential for developing phonological awareness, a predictor of later reading success (Bratsch-Hines, et al, 2020). However, teachers frequently lack access to multisensory resources that cater to diverse learning needs, limiting their ability to deliver differentiated instruction effectively (Rachmani, 2020). Additionally, there is a scarcity of empirical research validating the efficacy of locally designed instructional tools, which restricts their broader adoption and adaptation (Balikci, 2020). Addressing these gaps is vital to improve literacy outcomes and ensure culturally responsive, evidence-based teaching practices.

Problem Statement and its Implications of the Problems to Learners, country and professionals

The ongoing struggle of Filipino learners in developing basic reading proficiency is a critical challenge not only to the learners but also to the entire education system. When children are not able to read effectively at a young age, they encounter obstacles that go beyond their academic performance, affecting their self-esteem and confidence. In the Philippine setting, the high incidence of functional illiteracy and learning poverty threatens to create a cycle of poverty for the next generation. The effects of illiteracy spread from the family to the community and eventually impact the country's competitiveness in the global economy, as an uneducated workforce is unable to cope with the requirements of a knowledge-based economy. The question "What can we do?" requires an effective response to this problem that will enhance the reading performance of learners and improve teacher capacity. Aside from the learning approaches, the support system in the educational sector should focus on resource allocation and policy development to provide equal access to quality education for all Filipino students. Through investing in early literacy, the country can end the cycle of functional illiteracy, boost the confidence of learners, and improve competitiveness in the international setting. The challenge is collective, but it is leadership and creativity that will shape the future of Philippine education.

Proposed Intervention by the Researcher

As one of the pre-service teachers, the researcher suggests the development of an interactive learning tool that is contextualized and localized to address the critical need for enhanced reading skills among young learners. This intervention focuses on a low-cost and flexible approach to phonological teaching. The learning tool is designed to be self-managed and self-operated, allowing children to work on the content independently, without any intimidation or anxiety associated with errors, thereby promoting a positive learning experience. Furthermore, the intervention aims to enhance home-school partnerships in literacy by developing a learning tool that can be efficiently utilized in both the classroom and home environments, promoting joint efforts in supporting young learners in their literacy development. This approach aligns with contemporary educational goals of inclusivity, learner autonomy, and community involvement in early literacy. Hence, this study was conducted with the foregoing objectives.

Objectives of the Study

This study primarily aimed to develop and evaluate the effectiveness of a 3-in-1 Toolkit Flashcard

designed to enhance phonological awareness among Key Stage 1 learners (Grades 1–3) in a private archdiocesan school. The intervention was assessed through a Quasi-Experimental Pretest–Posttest Design with Non-Randomized Multiple Groups. Specifically, the study sought to:

1. Design and develop a 3-in-1 Toolkit Flashcard integrating rhyming, blending, and segmenting activities appropriate for learners in Grades 1 to 3 using the ADDIE model;
2. Determine the levels of phonological awareness performance of Grade 1–3 pupils before and after the implementation of the 3-in-1 Toolkit Flashcards;
3. Assess the learners' attitudinal scores toward phonological awareness tasks prior to and following the intervention;
4. Evaluate the effectiveness of the 3-in-1 Toolkit Flashcards by comparing pretest and posttest scores in phonological awareness across the three grade levels; and.
5. Analyze the relationship between pupils' attitudes toward phonological awareness tasks and their performance gains after using the 3-in-1 Toolkit.

MATERIALS AND METHODS

Research Design

The research design employed in this study was a Mixed Methods Research Design, which combined both qualitative and quantitative research methods to acquire a thorough understanding of the development and effectiveness of the 3-in-1 Toolkit Flashcards in improving phonological awareness in Key Stage 1 students (Grades 1-3). The research design employed in this study was based on the ADDIE Model (Analysis, Design, Development, Implementation, and Evaluation).

To determine the effectiveness of the intervention, a **Quasi-Experimental Pretest-Posttest Design with Non-Randomized Multiple Groups** was used, enabling comparisons to be made among Grade 1, 2, and 3 students.

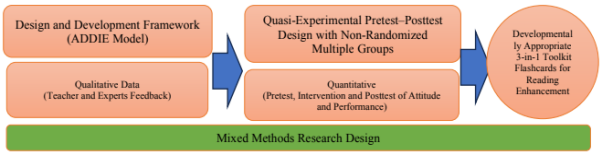

Figure 1. Research Methodology Framework

Quantitative data were obtained via pretest and posttest procedures to determine phonological awareness, while qualitative data, such as teacher responses, were collected to provide context for the results. This blend of research designs allowed for a strong analysis of both the development of the instructional product and its educational outcomes. This design entails choosing several groups of participants without the need for randomization, for instance, Grade 1, Grade 2, and Grade 3 students. This design helps in controlling the differences in the groups without randomization,

allowing for a better measurement of the intervention outcomes. This design is ideal when randomization is not possible. Each group will pretest to create a baseline measurement, followed by an intervention or treatment. Finally, a posttest will give to measure the outcomes of the intervention. This design allows for the comparison of the intervention outcomes among the groups, as well as among the grade levels, to help determine the effectiveness of the program despite the lack of randomization.

Sampling Technique

Due to the small and manageable population size, total sampling was conducted to include the entire population. A non-randomized multiple group design was utilized because random assignment was not possible in this natural classroom setting. Key Stage 1 children were selected as the target group because of the crucial role that Key Stage 1 plays in the development of basic reading skills, which are directly related to the curriculum and the current study on reading interventions.

Table 2. Profile Characteristics of the Respondents

Profile Variables	Categories	Frequency (n=58)	Percentage
Sex	Male	34	58.6%
	Female	24	41.4%
Age	6 years old	12	20.7%
	7 years old	22	37.9%
	8 years old	20	34.5%
	9 years old	3	5.2%
	10 years old	1	1.7%
Grade Level	Grade 1	15	25.84%
	Grade 2	24	41.36%
	Grade 3	19	32.8%

As seen in Table 2 shows the profile characteristics of the 58 Key Stage 1 participants. By sex, there were 34 (58.6%) males and 24 (41.4%) females. By age, most of the participants were 7 years old (22 or 37.9%), followed by 8 years old (20 or 34.5%), and 6 years old (12 or 20.7%). Fewer participants were 9 years old (3 or 5.2%) and 10 years old (1 or 1.7%). By grade level, 15 (25.84%) were in Grade 1, 24 (41.36%) in Grade 2, and 19 (32.8%) in Grade 3. This profile gives a clear view of the age and grade composition of the respondents, which is important in the interpretation of the results of the intervention. In the Philippines, Key Stage 1 includes Grades 1 to 3, aged 6 to 8, which emphasizes basic literacy, numeracy, and oral skills using the MTB-MLE approach.

This research was done at San Lorenzo Ruiz Educational Institute, Inc. (SLREI), under the Tuguegarao Archdiocese School System (TASS), which is a private Catholic school in the Municipality of Lasam, Cagayan, Philippines. that has stable class sizes, a structured environment, and adequate resources. It is an appropriate setting to pilot test innovative approaches to education such as the 3-in-1 Toolkit Flashcards before implementing it on a larger scale in a public-school setting.

Locale of the study

The study covered all 58 Key Stage 1 learners of San Lorenzo Ruiz Educational Institute, Inc. for the 2024-2025 academic year, including 15 Grade 1, 22 Grade 2, and 21 Grade 3 learners.

Research Instruments

The study employed two major instruments: (1) the Smiley-Based Likert Phonological Attitude Scale for Early Learners (SLA-EL) and (2) the Phonological Awareness Actual Test. The SLA-EL uses smiley faces to aid early learners in easily stating their attitudes towards reading. The scale was validated by experts and pilot-tested, which resulted in high reliability (Cronbach alpha = 0.87) and high face validity. The Phonological Awareness Actual Test is an instrument that measures reading-related skills in three levels of sound identification, blending and segmentation, and phoneme manipulation, which are aligned with the Key Stage 1 curriculum. It was also validated by language specialists and pilot-tested, demonstrating good test-retest reliability (0.82). Together, these instruments provide

reliable and age-appropriate measures of learners' attitudes and phonological skills relevant to the study's objectives.

Ethical Consideration and Data Gathering Procedure

Table 3. Stages of Data Gathering Process

Stage	Timeframe	Procedures
Pre-Intervention Stage	August-September 2024	• Observation and Problem diagnoses stage identification (Gap Analysis Tool) • Recording of learners' strengths and weaknesses in reading • Interview with the teachers to validate gap analysis
University ethics Approval and Permission Seeking	October-November 2024	• Submission and granting of university ethics approval • Sent a formal letter of request to the school head for approval to conduct the study.
Phonological 1 Kit Development Stage	November 2024	• Planning and Conceptualization and Content Development • Invention spotting and product differentiation • Design and Layout and Material Production • Initial Expert evaluation of the tool and refinement before implementation
Implementation of Intervention stage	November 2024	• Pilot-tested the toolkit with key stage 1 pupils (Grades 1-3) to assess effectiveness, engagement, clarity, and difficulty. • Modified content and design as needed.
Post Intervention Stage	December 2024	• Collected and analyzed test results to assess the effectiveness of the intervention. • Dating and Completed the Final Report

The data collection of this study began with the submission and granting of university ethics approval by the CSU-IERB with a protocol number CSU-IERB-2024-07-04, Version 1. The researcher also ensured that the ethical issues in this study. Maintaining confidentiality, freedom of choice, and informed consent to the respondents. Likewise, this study also complied with the university policy on Similarity Index and Artificial Intelligence (AI) checking. Acknowledgement of all resources and references used and data privacy has been observed. After the granting of ethics approval, the formal permission sought from the school head, followed by the distribution of informed consent letters to parents and guardians to ensure ethical compliance. The intervention was then implemented, with pre-tests conducted before and post-tests after the innovation within the same week to assess its impact. Finally, the collected data were evaluated on December 14, 2024, to analyze learners' progress and the effectiveness of the intervention.

Analysis of the Data/ Statistical treatment

This study employed both descriptive and inferential statistical methods. Descriptive statistics such as mean and standard deviation were used to summarize the respondents' attitudes and phonological performance. For inferential analysis, dependent sample t-tests, one-way ANOVA, Wilcoxon rank-sum tests, and Spearman's rho correlation were conducted to determine significant differences and relationships in the data. To confirm the normality of the data and to help in the decision of whether to use parametric or non-parametric tests, the Shapiro-Wilk test was used. All the statistical tests were done using SPSS Version 29 software, with the help of a licensed statistician.

Regarding the qualitative aspect, the comments made by the five teacher-experts on the toolkit were analyzed through content analysis. The comments made by the teacher-experts were analyzed manually, and the points of convergence were identified and categorized according to themes such as clarity, aesthetics, alignment, and engagement. This helped in identifying the areas that require improvement. The comments were analyzed carefully to ensure that the improvements made to the toolkit were in line with the literacy needs of Key Stage 1 children and the tenets of developmentally appropriate practice.

Table 4. Test of Normality of the Pre and Post Phonological Awareness Performance of Grades 1-3

		Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Grade 1 (n=15)	Pre- Phonological Awareness Score	.135	15	.200*	.955	15	.608
	Post- Phonological Awareness Score	.296	15	.001	.830	15	.009
Grade 2 (n=24)	Pre- Phonological Awareness Score	.105	15	.200*	.980	15	.969
	Post- Phonological Awareness Score	.181	15	.200*	.902	15	.101
Grade 3 (n=19)	Pre- Phonological Awareness Score	.216	15	.057	.929	15	.260
	Post- Phonological Awareness Score	.278	15	.003	.820	15	.007

**. This is a lower bound of the true significance.*
a. Lilliefors Significance Correction

Table 5. Test of Normality of the Pre and Post Attitude Performance of Grades 1-3

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre- Phonological Awareness Score	.093	58	.200*	.984	58	.648
Post- Phonological Awareness Score	.090	58	.200*	.962	58	.063

**. This is a lower bound of the true significance.*
a. Lilliefors Significance Correction

Result of the Normality Test for Quantitative Data

Table 4 shows the Shapiro-Wilk test in Table 4 indicated that the pre-test phonological awareness scores of Grade 1 pupils (n = 15) were normally distributed (W = 0.955, p = .608), but the post-test scores were significantly not normally distributed (W = 0.830, p = .009). For Grade 2 (n = 24), both the pre-test (W = 0.980, p = .969) and post-test (W = 0.902, p = .101) scores were normally distributed. For Grade 3 (n = 19), the pre-test scores were normally distributed (W = 0.929, p = 0.260), while the post-test scores significantly deviated from normality (W = 0.820, p = 0.007). The results indicate that while the pre-test scores of all grades tended to satisfy the assumption of normality, the post-test scores of Grades 1 and 3 significantly deviated from normality. This indicates that both parametric and non-parametric tests may be considered suitable for the analysis of the data, especially in the assessment of the effectiveness of the intervention at various time points. On the basis of the Shapiro-Wilk test, parametric tests such as the paired sample t-test can be used to analyze the pre-test and post-test scores of Grade 2 because both scores were normally distributed. However, for Grades 1 and 3, where the post-test scores significantly deviated from normality, non-parametric tests such as the Wilcoxon signed-rank test should be used to assess changes in phonological awareness performance.

As presented in Table 5, for the attitudinal speaking scores of the entire sample (N = 58), the Shapiro-Wilk test showed no significant deviation from normality for either the pre-test (W = 0.984, p = .648) or post-test (W = 0.962, p = .063) scores. These results indicate that the data for attitudinal speaking performance met the assumption of normality, supporting the use of parametric tests in analyzing changes in learners' attitudes before and after the intervention. Since both the pre-test (W = 0.984, p = .648) and post-test (W = 0.962, p = .063) attitudinal speaking scores met the assumption of normality, a paired sample t test is the appropriate statistical tool to use for analyzing the changes in learners' attitudes before and after the intervention.The normality tests showed that phonological awareness scores were normally distributed only for Grade 2, while Grades 1 and 3 had non-normal post-test scores, suggesting the use of both parametric and non-parametric tests accordingly. Attitudinal speaking scores for all grades met normality assumptions, supporting the use of parametric tests. It is recommended to apply paired sample t-tests for normally distributed data and Wilcoxon signed-rank tests for non-normal data to accurately assess intervention effects.

Table 6. Steps followed in the Development of the 3-in-1 Phonological Kit

Steps	Description	Actual Picture
Step 1. Planning and Conceptualization and Content Development	• Recognized the requirement for a localized, multi-skill phonological aid catering to students in Grades 1-3. • Highlighted essential elements (rhyming, blending, and segmenting). • Developed phonological activities based on literacy standards. Picked words and images suitable for each grade level.	
Step 2. Design and Layout and Material Production	• Designed colorful and interesting card layouts using picture clues, word hints, and easy-to-follow directions. • Printed, laminated, and cut the flashcards and arranged them in a labeled toolkit (box) to ensure durability and portability.	
Step 3. Expert Review and Refinement	• Presented prototype to language educators, parents and teachers for critique. • Revised based on feedback to improve usability and alignment with learning goals.	
Step 4. Pre-testing	• Pilot-tested with a small group of pupils to observe engagement, difficulty, and clarity. • Adjusted design and content as needed.	
Step 5. Final Packaging and Labeling	• Organized flashcards into compartments: • Rhyming, Blending, Segmenting. • Labeled toolkit and provided instructional guide.	
Step 6. Implementation for Effectiveness to the Kye Stage 1 Learners	Implemented in the classroom to obtained data on its effectiveness and attitudinal effects	  

Design and Development Phases of the 3-in-1 Phonological Toolkit Flashcards using the ADDIE Model (Analysis, Design, Development, Implementation, and Evaluation)

This study employed the ADDIE model which is methodical approach that meets the needs of the students, its application in instructional design. The ADDIE model, which consists of five phases in which this study used as a process: Analysis, Design, Development, Implementation, and Evaluation, followed the process of designing and developing the 3-in-1 Toolkit Flashcard. The successful design and development of the 3-in-1 Phonological Toolkit Flashcards demonstrate how instructional tools, when grounded in needs-based analysis and supported by pedagogical principles, can significantly contribute to improving phonological awareness in Grades 1–3. The toolkit's novelty lies in its integration of rhyming, blending, and segmenting skills in a single, child-friendly, and sustainable resource.

A. Analysis Phase

Based form the Gap Analysis of this study, the researcher observed a classroom to understand the students' needs in learning to enhance phonological awareness, specifically in their three (3) skills, namely: Sound letter recognition, syllable segmentation, and word recognition. Upon observing, the researcher noticed that they lack of teaching and supporting aids towards reading materials for the key stage 1. In line with this, it motivated the researcher to design and developed a 3-in-1 toolkit flashcards to help improve phonological awareness.

B. Design Phase

The design phase of the 3-in-1 toolkit flashcards is presented in a rectangular shape like a toolbox. The design, size, rewards, and content of the instructional materials were highly approved by the expert evaluators. The toolkit measures 90cm in length and 10cm in width. The box is made up of plywood to maintain its durability. The card size is 5cm by 5cm, made up of illustration board, and to maintain the durability, the researcher decided to cover a transparent plastic sheet per cards. The cards contain 3 level; also called "RAM" (recognition, awareness and mastery) for Level 1 (sound letter recognition- recognition) composed of 26 letters Level 2 (syllable segmentation – awareness) composed of 15 items and Level 3 (word recognition-mastery) 15 sight words a total of 56 items in level. In addition, the back of the IMs consists of 3 holes to get their rewards to pursue and motivate the learners. These IMs enlighten how important and effective the use of printed instructional materials is in the field of academics, especially in enhancing phonological awareness and globally equipping independent readers in the future.

Phonic Tool Kit Differentiation and Invention Spotting

To establish the novelty and value of the 3-in-1 Toolkit Flashcards, the researcher conducted a differentiation analysis comparing existing phonics tools. The Heggerty Curriculum is a very popular curriculum that provides a systematic and comprehensive approach but needs trained teachers to implement it effectively. Lakeshore Flashcards are colorful and engaging but only serve as flashcards and lack the component of phonological skills. Jolly Phonics Flashcards are very popular and phonics-based but lack comprehensiveness in including a wide range of phonological awareness. Sound Boxes are practical and effective but require additional materials to implement. On the other hand, the 3-in-1 Toolkit Flashcards offer a comprehensive and cost-effective solution that brings together three essential phonological skills: rhyming, blending, and segmenting, into one convenient and interactive tool. This toolkit is age-appropriate and culturally relevant, requiring no additional materials or specialized training, and even comes with assessment tools, making it a very practical and useful tool for young learners.

C. Development Phase

The 3-in-1 Toolkit Flashcards took more than two weeks to develop. The project began on October 20, 2024, and ended on November 07, 2024. The philosophy that underlies the development of the 3-in-1 Toolkit Flashcards is based on the pressing need to respond to the reading crisis among early grade learners through the provision of a (1) contextualized (2) localized, and (3) interactive learning solution. In cognizance of the limited availability of quality reading materials among school communities, the toolkit was designed to be low-cost, visually appealing, and pedagogically structured, while remaining flexible to suit varying classroom contexts. It combines the basic elements of phonological awareness, namely rhyming, blending, and segmenting, in a manner that is amenable to manipulation by children, thereby allowing for both teacher-led and independent learning. The toolkit also eliminates fear of failure or intimidation that may be associated with error-making, thereby encouraging learning. In addition, the toolkit was conceptualized not only as a learning tool in the classroom but also as a mechanism to facilitate the home-school partnership in literacy, thereby enabling parents or guardians to become active participants in their child's reading process.

The creation of the 3-in-1 Phonological Toolkit Flashcards based on the ADDIE Model was successful in filling important gaps in early literacy education. Based on a needs analysis, the toolkit aims to develop sound-letter association, syllable segmentation, and word recognition as three important phonological skills. The innovative approach of the toolkit combines several skills into one long-lasting, interactive, and affordable tool. Unlike other phonics tools, it does not require any special training, making it useful both in and out of the classroom. The RAM model (Recognition, Awareness, Mastery) promotes progressive learning and learner engagement through rewards. The toolkit is an example of how educational materials developed with real classroom needs and sound educational principles can improve phonological awareness. The toolkit demonstrates the use of locally developed materials in promoting early reading skills and integrating school and home literacy practices. The creation of the 3-in-1 Phonological Toolkit Flashcards involved planning and content development, designing and producing high-quality materials, expert review and revision, pilot testing with students, final packaging with labeling, and implementation in the classroom to determine its effectiveness.

RESULTS AND DISCUSSION

Research Objective 1. Description, Overview, Technical Specifications of the Developed 3-in-1 Phonological Toolkit Flashcard

Table 7. Technical Specifications and Components of the Developed 3-in-1 Phonological Toolkit Flashcard

Name of Tool 3-in-1 Phonological Toolkit Flashcards	Name of Tool 3-in-1 Phonological Toolkit Flashcards
Target Users	Grade 1-3 pupils (Key Stage 1-3)
Main Purpose	Enhance phonological awareness through interactive and focused practice
Toolkit/ Toolbox	Length: 90 cm, width: 30 cm
Flashcards	Length: 5cm, width: 3cm
Key Features	Rhyming, Blending, and Segmenting activities in one compact, easy-to-use tool
Format	Colorful, laminated flashcards with picture cues, word prompts, and instructions
Usability	For classroom teaching, peer learning, and take-home reading support
Teacher Benefit	Ready-to-use, low-prep material that aligns with literacy goals
Learner Benefit	Improves sound recognition, word decoding, and reading confidence
Rationale	The 3-in-1 Toolkit Flashcards is an innovative and affordable learning resource for Grade 1 to 3 students, created to develop essential phonological skills (rhyming, blending, and segmenting) in one resource. The colorful and laminated cards, with the use of pictures, help in classroom instruction, inter-class learning, and home practice. Teachers have ready-made resources, and students develop reading confidence through engaging and fun activities.

Figure 2 and Table 7 above show the description and overview of the developed 3-in-1 Phonological Toolkit Flashcards. It emphasizes the technical specifications and components that make up the toolkit, illustrating how the components interact to facilitate the improvement of phonological awareness skills for Grades 1 to 3 students.

The 3-in-1 Phonological Toolkit Flashcards is a well-crafted teaching aid deliberately designed for Grade 1 to 3 students to improve their phonological skills. The toolkit integrates three vital phonological skills: rhyming, blending, and segmenting, into one convenient and user-friendly set of colorful and laminated flashcards.

Figure 2. Actual Picture of the Designed and Developed of 3-in-1 Toolkit Flashcards in Enhancing Key Stage 1 (Grades 1-3) Phonological Awareness

Its functional size and robust materials make it ideal for use in the classroom, between peers, and at home. For the teacher, the toolkit provides a ready-made, low-prep resource that is relevant to literacy objectives, making teaching easier. For the child, it provides an attractive and interactive means of enhancing sound awareness, word decoding, and general reading confidence. This innovative, affordable resource is an effective solution to the requirement for accessible phonological learning resources in early childhood education.

Mechanics of Utilization

As shown in Figure 3, to properly employ the 3-in-1 Phonological Toolkit Flashcards, the teacher chooses the set of flashcards that match the skill level of the learner, which could be Recognition, Awareness, or Mastery. The teacher then introduces the flashcards to the students, explaining their use and how the students should use them. In Level 1, students concentrate on recognizing letters and their sounds, while in Level 2, they learn to segment words into syllables. In Level 3, students are tasked with recognizing and reading sight words. The toolkit promotes collaborative learning by assigning students to work in pairs, and it also has a reward system that uses holes on the back of the cards to motivate students by recognizing their progress. The flashcards are used on a daily basis in class and at home, while the teacher is constantly evaluating the students' performance.

Figure 3. Actual Pictures of Rewards per level

Curriculum Integration and Relevance

Curriculum integration is utilized in the 3-in-1 Phonological Toolkit Flashcards through the integration of core phonological skills such as rhyming, blending, and segmenting in the context of the K to 12 Basic Education Curriculum for English at Key Stage 1 (Grades 1 to 3). The tool is specifically designed to support the Most Essential Learning Competencies (MELCs) in literacy, ensuring that each activity is aligned with the learning outcomes in oral language development, beginning reading, and foundational phonics. The tool promotes the use of the mother tongue or English as medium of instruction

Table 8. Over-all Pre and Post phonological awareness performance of Grade 1–3 pupils before and after the implementation of the 3-in-1 Toolkit Flashcard

	Mean	SD	Interpretation
Pre- Phonological Awareness Score (Grade 1)	11.20	2.484	High /Proficient
Post- Phonological Awareness Score (Grade 1)	13.80	1.265	Very High Mastery
Pre- Phonological Awareness Score (Grade 2)	9.08	2.812	Moderate/ Developing
Post- Phonological Awareness Score (Grade 2)	12.50	2.043	Very High Mastery
Pre- Phonological Awareness Score (Grade 3)	10.53	2.091	High/ Proficient
Post- Phonological Awareness Score (Grade 3)	13.32	1.565	Very High Mastery

Legend: 13-15 (Very High Mastery), 10-12 (High/ Proficient), 7-9 (Moderate/ Developing), 4-6 (Low/ Emerging), 1-3 (Very Low/ Struggling)

Table 9. Pre and Post Phonological Awareness Performance of Grade 1 (n=15)

Pre (Actual Performance)	Mean	SD	Interpretation	Post (Actual Performance)	Mean	SD	Interpretation
Level 1 (sound letter recognition)	3.67	1.047	High/Proficient	Level 1 (sound letter recognition)	4.67	0.488	Very High/Mastery
Level 2 (syllable segmentation)	3.80	0.941	High/Proficient	Level 2 (syllable segmentation)	4.60	0.507	Very High/Mastery
Level 3 (word recognition)	3.73	1.163	High/Proficient	Level 3 (word recognition)	4.53	0.640	Very High/Mastery

Legend: 4.20-5.00= Very High/Mastery, 3.40- 4.19= High/Proficient, 2.60-3.39= Moderate/Developing, 1.80-2.59= Low/Emerging, 1.00-1.79= Very Low/Struggling

depending on the grade level, supporting language transfer and understanding as espoused in the curriculum. It also promotes integration across learning areas, especially in Makabayan subjects, through the use of localized and culturally relevant word samples and images that reflect real-life contexts familiar to Filipino learners.

Research Objective 2. Determine the levels of phonological awareness performance of Grade 1–3 pupils before and after the implementation of the 3-in-1 Toolkit Flashcard

Based on the ADDIE Model, research objective 2 will offer information regarding the assessment of the effectiveness of the 3-in-1 Phonological Toolkit Flashcards, it is important to investigate the levels of phonological awareness of Grade 1 to 3 pupils before and after the implementation of the toolkit. This research objective aims to find out if there is a significant improvement in the essential skills of phonological awareness (rhyming, blending, and segmenting) as a result of the implementation of the toolkit.

Table 8 shows the comparative pre- and post-phonological awareness performance of Grades 1 to 3 pupils after the application of the 3-in-1 Toolkit Flashcards. The results clearly indicate a steady improvement in all levels. Grade 1 pupils' mean score improved from 11.20 (SD = 2.484), which was interpreted as High/Proficient, to 13.80 (SD = 1.265), which belonged to the Very High Mastery level. Grade 2 pupils, who were Moderate/Developing (M = 9.08, SD = 2.812) prior to the intervention, showed Very High Mastery (M = 12.50, SD = 2.043) after the intervention. Grade 3 pupils also showed improvement from High/Proficient (M = 10.53, SD = 2.091) to Very High Mastery (M = 13.32, SD = 1.565). The significant improvement in all levels indicates that the toolkit was effective in improving phonological awareness, especially in helping pupils advance from moderate or proficient levels to mastery.

Table 9 specifically examines the phonological awareness components for Grade 1 (n = 15). At all three levels sound letter recognition, syllable segmentation, and word recognition learners showed substantial gains. Pre-test results across the three levels showed High/Proficient means: 3.67, 3.80, and 3.73 respectively. After using the toolkit, these increased to 4.67, 4.60, and 4.53, respectively within the Very High/Mastery range. These results demonstrate that even learners who were already performing well benefited from the scaffolded and multisensory approach of the toolkit, suggesting the

Table 10. Pre and Post Phonological Awareness of Grade 2 (n=24)

Pre (Actual Performance)	Mean	SD	Interpretation	Post (Actual Performance)	Mean	SD	Interpretation
Level 1 (sound letter recognition)	3.25	1.073	Moderate/Developing	Level 1 (sound letter recognition)	4.21	0.721	Very High/Mastery
Level 2 (syllable segmentation)	2.75	1.359	Moderate/Developing	Level 2 (syllable segmentation)	4.17	0.761	High/Proficient
Level 3 (word recognition)	3.08	1.213	Moderate/Developing	Level 3 (word recognition)	4.13	0.741	High/Proficient

Legend: 4.20-5.00= Very High/Mastery, 3.40- 4.19= High/Proficient, 2.60-3.39= Moderate/Developing, 1.80-2.59= Low/Emerging, 1.00-1.79= Very Low/Struggling

Table 11. Pre and Post Phonological Awareness of Grade 3 (n=19)

Pre (Actual Performance)	Mean	SD	Interpretation	Post (Actual Performance)	Mean	SD	Interpretation
Level 1 (sound letter recognition)	3.74	0.872	High/Proficient	Level 1 (sound letter recognition)	4.47	0.612	Very High/Mastery
Level 2 (syllable segmentation)	3.68	1.493	High/Proficient	Level 2 (syllable segmentation)	4.47	0.513	Very High/Mastery
Level 3 (word recognition)	3.11	0.875	Moderate/Developing	Level 3 (word recognition)	4.37	0.597	Very High/Mastery

Legend: 4.20-5.00= Very High/Mastery, 3.40- 4.19= High/Proficient, 2.60-3.39= Moderate/Developing, 1.80-2.59= Low/Emerging, 1.00-1.79= Very Low/Struggling

intervention's capacity to push learners toward mastery through repeated exposure and strategic practice.

Table 10 highlights the performance of Grade 2 learners (n = 24), who were Moderate/Developing in all aspects of phonological awareness, including sound-letter recognition (M = 3.25), syllable segmentation (M = 2.75), and word recognition (M = 3.08). However, the post-test results indicated an incredible improvement in all aspects, including sound-letter recognition, which was Very High/Mastery (M = 4.21), while syllable segmentation (M = 4.17) and word recognition (M = 4.13) were High/Proficient. This indicates that the toolkit was most effective for Grade 2 learners, who required extra support to advance from a developing to a proficient level. The organized approach of the toolkit may have helped to fill the cognitive gaps in phonemic awareness.

Table 11 indicates the performance improvement of Grade 3 students (n = 19), who also demonstrated improvement in the three levels of phonological skills. The pre-test data indicate Moderate/Developing performance in word recognition (M = 3.11), but High/Proficient in sound letter recognition (M = 3.74) and syllable segmentation (M = 3.68). After the intervention, the performance improved to Very High/Mastery levels of 4.47 in sound letter recognition and syllable segmentation, and 4.37 in word recognition. The above data indicate the effectiveness of the toolkit in filling the remaining gaps in phonological skills, even among older early-grade students who may have plateaued in some skills.

The data obtained from all levels of grades emphasizes the instructional utility of the 3-in-1 Toolkit Flashcards in teaching and developing fundamental reading skills. The comprehensive design of the flashcard set, which combines the concepts of sound-letter recognition, syllable segmentation, and word recognition, targets the essential skills required for efficient reading. The steady progress made by the students also indicates that differentiated instruction with the toolkit can be applied in remedial and enrichment programs. The adaptability of the toolkit makes it ideal for multi-grade classes and learning needs.

The results of this study support the existing literature on the importance of phonological awareness as a predictor of reading achievement (Diaz et al, 2022, National Reading Panel, 2000; Ehri et al., 2001). As stated by Yeung et al (2020), the explicit instruction of phonological awareness components such as blending, segmenting, and rhyming can significantly improve early literacy skills. The current study supports this by offering

quantitative proof of the importance of structured multisensory tools in the classroom. Furthermore, the results support the tenets put forth by Robinson-Kooi and Hammon (2020) who support the inclusion of comprehensive phonological awareness instruction as a strategy to improve literacy in young students. By incorporating these components into a cohesive toolkit, the study design adhered to best practices for early reading development as suggested in the literature.

On a similar note, Regis (2022) suggested that tools should be developmentally appropriate and engaging while also incorporating important reading skills. The child-friendly and sustainable design of the 3-in-1 Toolkit Flashcards seems to address this recommendation, as indicated by the progress noted in all areas of phonological skills. The success of the use of the 3-in-1 Toolkit Flashcards validates the efficacy of contextually developed instructional materials in enhancing phonological awareness skills of learners in Grades 1 to 3. The progress noted in all skill levels, particularly in the development of readers, underlines the importance of early literacy interventions. The results of this study add to the body of evidence that supports the application of integrated phonological awareness strategies as a foundation of early grade reading programs.

Research Objective 3. Assess the learners' attitudinal scores toward phonological awareness tasks prior to and following the intervention.

Table 12. Pre and Post Attitudinal Scores toward phonological awareness attitude for Grade 1–3 pupils before and after the implementation of the 3-in-1 Toolkit Flashcard

	Mean	Std. Deviation	Interpretation
	Statistic	Statistic	
Pre- Attitudinal Mean Score	3.19	.610	Moderate
Post- Attitudinal Mean Score	4.16	.501	High

Table 12 shows a remarkable change in the learners' attitudinal scores on phonological awareness tasks before and after the intervention with the use of the 3-in-1 Toolkit Flashcards. The pre-intervention mean attitudinal score was 3.19 (SD = 0.610), which falls under the Moderate category, signifying a neutral attitude of the learners towards phonological awareness tasks. This implies that before the intervention, the learners might have found these tasks uninteresting, challenging, or irrelevant to their learning processes. Conversely, the post-intervention mean attitudinal score was remarkably high at 4.16 (SD = 0.501), which falls under the High category, signifying a positive change in the learners' attitudes following the implementation of the toolkit.

This shift in attitude indicates that the learners showed a greater level of interest, confidence, and enjoyment in phonological awareness tasks after being introduced to the 3-in-1 Toolkit Flashcards. The rise from a neutral to a positive attitude indicates that the intervention not only focused on cognitive development but also on affective involvement, which is crucial for successful literacy achievement in the early grades. This finding aligns with Vygotsky's (1978) sociocultural theory, which emphasizes that learning is most effective when cognitive and emotional factors are simultaneously addressed within supportive and interactive environments.

The post-intervention high rating also reflects the capacity of multisensory and interactive instructional materials to foster learners' motivation and willingness to participate in literacy tasks. As supported by the findings of Totaj (2024) when learners perceive reading-related tasks as enjoyable and meaningful, they are more likely to engage in self-regulated learning behaviors that promote literacy growth. Furthermore, phonological interventions that are embedded in play-based, visual, and auditory experiences such as those featured in the 3-in-1 Toolkit, have been shown to enhance learner attitudes by reducing anxiety and increasing curiosity and engagement (Lee et al, 2023). The results highlight the value of combining phonological instruction with attitude-enhancing strategies, especially in early childhood settings. Improved attitudes suggest a greater likelihood of learners participating actively in phonological activities,

which in turn enhances their acquisition of essential pre-reading and decoding skills. Educators are encouraged to integrate similar tools into their foundational literacy programs to nurture both skills and dispositions essential for reading success.

Moreover, the shift from moderate to high attitudes implies that interventions must not only be accurate and skill-based but also learner-centered, developmentally appropriate, and engaging. The effectiveness of the 3-in-1 Toolkit Flashcards in positively influencing learners' affective responses reinforces the call for designing instructional materials that are both pedagogically sound and emotionally responsive. This finding is echoed in studies by Boyask et al (2024) emphasized that students' attitudes toward reading and language tasks significantly predict their future reading behaviors and proficiency. Attitudinal gains, particularly at early stages, contribute to forming lifelong positive dispositions toward literacy learning. Similarly, studies by Layes, Laonde and Rebai (2021) showed that early interventions combining phonological training with engaging formats yield both academic and motivational benefits.

Table 13. Test of Difference on the Attitude when grouped according to Grade Levels

		N	Mean	Std. Deviation	Std. Error			Sum of Squares	df	Mean Square	F	Sig.	Interpretation
Pre-Attitudinal Speaking Mean Score	Grade 1	13	3.17	.61	.17	Pre-Attitudinal Speaking Mean Score	Between Groups	3.398	2	1.699	5.227	.008**	Significant
	Grade 2	26	2.97	.35	.06		Within Group	17.879	55	0.325			
	Grade 3	19	3.52	.74	.17		Total	21.277	57				
	Total	58	3.19	.61	0.08								
Post-Attitudinal Speaking Mean Score	Grade 1	13	4.25	.47	.13	Post-Attitudinal Speaking Mean Score	Between Groups	.704	2	.352	1.423	.250 ns	Not Significant
	Grade 2	26	4.04	.40	0.7		Within Group	13.617	55	.248			
	Grade 3	19	4.26	.61	.14		Total	14.322	57				
	Total	58	4.16	.50	.06								

Table 13 presents the results of the analysis of variance (ANOVA) used to determine whether there were significant differences in learners' attitudes toward phonological awareness tasks across three grade levels Grades 1, 2, and 3, before and after the implementation of the 3-in-1 Toolkit Flashcards. For the pre intervention attitudinal speaking scores, a statistically significant difference was found among the grade levels ($F = 5.227$, $p = .008$), indicating that learners' initial attitudes toward phonological awareness tasks varied depending on their grade level. Grade 3 pupils had the highest mean pre-score ($M = 3.52$, $SD = .74$), which was within the "Moderate" to "High" range, suggesting greater pre-existing interest or confidence in phonological tasks. In contrast, Grade 2 pupils had the lowest pre-score ($M = 2.97$, $SD = .35$), which remained within the "Moderate" category, indicating a more neutral or uncertain attitude prior to the intervention. However, in the post-intervention attitudinal speaking scores, the results showed no statistically significant difference across grade levels ($F = 1.423$, $p = .250$). All three grade levels showed improved mean scores: Grade 1 ($M = 4.25$), Grade 2 ($M = 4.04$), and Grade 3 ($M = 4.26$), all falling within the "High" category. This trend indicates that the 3-in-1 Toolkit Flashcards had a positive impact on the attitudes of all grades of learners, closing the gap created before the intervention. The pre-intervention attitudes of the learners showed a significant difference, which can be attributed to the differences in their development levels, with the older learners (Grade 3) having more experience with phonological tasks than the younger ones. This supports the views of Chapman and Tunmer (2003), who suggested that metalinguistic awareness and attitudes towards literacy are better in higher grades and with cumulative language experience.

Notably, however, the attitudinal differences were equalized after the intervention, which can be seen as an indication of the inclusive effectiveness of the toolkit. The 3-in-1 Toolkit Flashcards seem to have equalized learning

engagement for both younger and older participants. This finding is consistent with the argument of Sokol (2024), who argued that effective early literacy interventions must be developmentally appropriate but flexible enough to engage a range of learner abilities. These findings suggest that while younger participants may have had less favorable attitudes because of a lack of engagement and confidence, an effective, multisensory intervention such as the 3-in-1 Toolkit can improve attitudes regardless of age or grade level. This is further evidence that instructional equity in early literacy can be achieved when learning materials are designed to be engaging, culturally relevant, and accessible to all developmental levels.

For teachers and curriculum designers, this highlights the need for the application of universal design principles in the instruction of phonological awareness. The effectiveness of the toolkit in closing attitudinal gaps indicates that future interventions should aim at making learning enthusiasm common across grade levels, not only among those who are naturally enthusiastic about literacy tasks. The equalization of attitudes after the intervention is consistent with the Engagement Theory of Reading Development by Guthrie and Wigfield (2023), which highlights that when students are engaged in personally meaningful, socially interactive, and goal-oriented tasks, their motivation and affective orientation will be enhanced. Furthermore, Lehrl, Evangelou & Sammons (2020) indicate that if phonological awareness is presented using visual, kinesthetic, and auditory aids, then students are likely to enjoy the learning process, hence improving attitudes and ultimately succeeding in reading.

Research Objective 4. Evaluate the effectiveness of the 3-in-1 Toolkit Flashcards by comparing pretest and posttest scores in phonological awareness across the three grade levels; and

Table 14. Wilcoxon Signed-Rank Test Results on Pre- and Post-Test Phonological Awareness Scores of Key Stage 1 Learners (Grades 1-3)

Wilcoxon Signed-Rank Test		N	Mean	Sum of Ranks	Z value	p-value	Interpretation
Grade 1. Post- Actual Performance Score - Pre- Actual Performance Score	Negative Ranks	0[a]	.00	.00	-3.198[b]	-.001**	Significant Improvement
	Positive Ranks	13[b]	7.00	91.00			
	Ties	2[c]					
	Total	15					
Grade 2. Post- Actual Performance Score - Pre- Actual Performance Score	Negative Ranks	0[d]	.00	.00	-4.127[b]	.000**	Significant Improvement
	Positive Ranks	22[e]	11.50	253.00			
	Ties	2[f]					
	Total	24					
Grade 3. Post- Actual Performance Score - Pre- Actual Performance Score	Negative Ranks	0[g]	.00	.00	-3.850[b]	.000**	Significant Improvement
	Positive Ranks	19[h]	10.00	190.00			
	Ties	0[i]					
	Total	19					

A. Post-actual performance score < pre- actual performance score
B. Post-actual performance score > pre- actual performance score
C. Post-actual performance score = pre- actual performance score
D. Post-actual performance score < pre- actual performance score
E. Post-actual performance score > pre- actual performance score
F. Post-actual performance score = pre- actual performance score
G. Post-actual performance score < pre- actual performance score
H. Post-actual performance score > pre- actual performance score
I. Post-actual performance score = pre- actual performance score

Note. Wilcoxon Signed-Rank Test was used due to violation of normality in post-test scores.

p < .05, p < .01

The results of the Wilcoxon Signed-Rank Test, which was employed to establish the significance of the differences in phonological awareness pre-test and post-test scores among learners in Grades 1 to 3, are shown in Table 14. The non-parametric Wilcoxon test was employed in this study because of the violation of the normality assumption of the data distribution, which is applicable when working with small sample sizes and non-normal data (Pallant, 2020). In Grade 1, the test showed that there was a statistically significant improvement in phonological awareness skills following the application of the 3-in-1 Toolkit Flashcards, with a Z-score of -3.198 and a p-value of .001 ($p < .01$). It is important to note that all the rank differences were positive or tied, with no

negative ranks, which indicates that none of the learners scored lower in the post-test. This is in line with the findings shown in Table 14, where improvements were noted in all three phonological components: sound-letter recognition, syllable segmentation, and word recognition, which indicates that the flashcards were effective in improving early decoding and phoneme manipulation skills.

Grade 2 students also showed a similar pattern, with the Wilcoxon test giving a Z-score of -4.127 and a p-value of .000, which was highly significant ($p < .01$). The positive ranks dominated the results, and, as in the previous case, there were no negative ranks. This is consistent with the findings in Table 4, which showed that the learners moved from "Moderate/Developing" to "High/Proficient" and "Very High/Mastery" levels in phonological tasks. This indicates that the intervention was highly effective, even for those learners who were less proficient initially. The findings are consistent with those of , who stressed that systematic and interesting phonological interventions result in observable gains in decoding, especially among struggling readers. The results for Grade 3 were also statistically significant ($Z = -3.850$, $p = .000$), thus confirming the effectiveness of the toolkit. As shown in Table 5, this group showed significant improvement, especially in word recognition, which is a higher-order phonological task, as they moved from "Moderate/Developing" to "Very High/Mastery" levels. These findings suggest that even older children in Key Stage 1 can benefit from multisensory, scaffolded phonological activities when combined with organized materials such as the 3-in-1 flashcards. These findings are in line with the results that phonemic awareness instruction is most effective when combined with letter knowledge and used in meaningful reading contexts (Rice et al, 2022, Ehri, 2022, Clemens et al, 2021).

The absence of negative ranks for all grades also reinforces the strength of the intervention. This is an indication that the toolkit did not have a negative effect on any of the learners but rather acted as a resource that benefited everyone, thus proving to be sound pedagogically. The improvements have important implications for education because phonological awareness in the early years is the cornerstone of reading fluency and comprehension, and tools can be used to close the gap in early literacy (National Reading Panel, 2000, Suggate et al, 2021).

Research Objective 5. Analyze the relationship between pupils' attitudes toward phonological awareness tasks and their performance gains after using the 3-in-1 Toolkit.

Table 15. Relationship between Grade 1 pupils' attitudes toward phonological awareness tasks and their performance gains after using the 3-in-1 Toolkit.

			POST-ATTITUDINAL SPEAKING MEAN SCORE	**POST- ACTUAL PERFORMANCE SCORE**
Spearman's rho	Post- Attitudinal Speaking Mean Score	Correlation Coefficient	1.000	.525*
		Sig. (2-tailed)		.044
		N	15	15
	Post- Actual Performance Score	Correlation Coefficient	.525*	1.000
		Sig. (2-tailed)	.044	
		N	15	15
*. Correlation is significant at the 0.05 level (2-tailed).				

Table 15 shows the Spearman's rank-order correlation was conducted to assess the relationship between Grade 1 pupils' attitudes toward phonological awareness tasks and their actual performance scores following the implementation of the 3-in-1 Toolkit Flashcards. This non-parametric test was selected due to the violation of

Table 16. Relationship between Grade 2 pupils' attitudes toward phonological awareness tasks and their performance gains after using the 3-in-1 Toolkit.

			POST-ATTITUDINAL SPEAKING MEAN SCORE	**POST- ACTUAL PERFORMANCE SCORE**
Spearman's rho	Post- Attitudinal Speaking Mean Score	Correlation Coefficient	1.000	.053
		Sig. (2-tailed)		.806
		N	24	24
	Post- Actual Performance Score	Correlation Coefficient	.053*	1.000
		Sig. (2-tailed)	.806	
		N	24	24

Table 17. Relationship between Grade 3 pupils' attitudes toward phonological awareness tasks and their performance gains after using the 3-in-1 Toolkit.

			POST-ATTITUDINAL SPEAKING MEAN SCORE	**POST- ACTUAL PERFORMANCE SCORE**
Spearman's rho	Post- Attitudinal Speaking Mean Score	Correlation Coefficient	1.000	.494*
		Sig. (2-tailed)		.032
		N	19	19
	Post- Actual Performance Score	Correlation Coefficient	.494*	1.000
		Sig. (2-tailed)	.032	
		N	19	19
*. Correlation is significant at the 0.05 level (2-tailed).				

normality in the post-test scores. Results revealed a moderate positive correlation between pupils' post-attitudinal scores and post-performance scores, which was statistically significant, rs=.525, p=.044r_s = .525, \, p = .044rs=.525,p=.044, N=15N = 15N=15.

This finding indicates that higher attitudinal scores—reflecting more positive perceptions toward phonological tasks were associated with better phonological awareness performance. This aligns with motivational theories in education (Deci & Ryan, 2002; Guthrie & Wigfield, 2000), which emphasize that learners' affective engagement can enhance academic performance, especially in early literacy development. Consequently, integrating affective and motivational strategies into reading interventions may enhance their overall impact.

Table 16 presents the Spearman's rank-order correlation which was conducted to examine the relationship between Grade 2 pupils' attitudes toward phonological awareness tasks and their actual performance scores after the use of the 3-in-1 Toolkit Flashcards. This statistical test was used due to the ordinal nature of the attitudinal data and to account for potential non-normality in the distribution. The results revealed no statistically significant correlation between post-attitudinal scores and post- performance scores among Grade 2 pupils, rs=.053, p=.806, N=24r_s = .053, \, p = .806, \, N = 24rs =.053,p=.806,N=24.

This result implies that, for Grade 2 students, having more positive attitudes towards phonological awareness activities was not significantly related to their actual gains in performance. One possible implication here is that the relationship between attitude and learning outcomes may differ depending on the level of development or may be influenced by other variables such as prior reading skills, teacher assistance, or learning environment (Bekcer & Sylvan, 2021, Johnson, 2021). This result highlights the need for differentiated instruction that takes into account both cognitive readiness and affective states, as having a positive attitude alone may not necessarily lead to actual gains in performance during the middle primary grades.

Table 17 shows the Spearman's rank-order correlation test was employed to establish the correlation between the post-attitudinal speaking scores and the post-actual performance scores of Grade 3 pupils on phonological awareness tasks following the application of the 3-in-1 Toolkit. The results revealed a moderate positive

correlation that was statistically significant, rs = .494, p = .032r_s = .494, p = .032rs =.494,p=.032. This indicates that the pupils who showed more positive attitudes towards phonological awareness tasks were likely to record higher performance scores following the intervention. This result is consistent with the assertion that learner motivation and affective engagement are factors that can impact literacy-related outcomes (Leitao et al 2022). The moderate strength of the correlation coefficient indicates that attitude, while not the only factor that determines performance, plays an important role in improving students' learning outcomes. Instructional strategies that increase engagement such as using interactive, game-based, or toolkit-supported learning may lead not only to improved attitudes but also to measurable gains in reading readiness and phonological skills. Teachers should be encouraged to consider both cognitive and affective domains when planning interventions for struggling readers.

Positive attitudes toward phonological awareness tasks are generally associated with improved performance, particularly in the early and later primary grades. The analysis of the relationship between Grade 1, 2, and 3 pupils' attitudes toward phonological awareness tasks and their performance gains after using the 3-in-1 Toolkit reveals important insights into how affective engagement can influence early literacy development. For Grade 1 pupils, a moderate positive and significant correlation was found between post-attitudinal scores and post-performance scores, suggesting that a more positive attitude toward phonological tasks was associated with higher performance gains. This supports the notion that learners' attitudes can significantly impact their literacy development, especially in the early grades (Deci & Ryan, 1985; Guthrie & Wigfield, 2023). By contrast, Grade 2 students did not show a significant correlation between attitudes and performance improvement, which indicates that other factors, such as prior knowledge or class environment, may play a more important role in this stage of development (Cai, Peng & Ge, 2024). Nevertheless, for Grade 3 students, a moderate positive and significant correlation was found once again, which further supports the notion that having a positive attitude towards phonological awareness tasks is associated with enhanced performance, although other factors may play a mediating role in this process. The above results highlight the need to integrate both cognitive and affective aspects into teaching practices, particularly for early and mid-primary students. Teachers should take into consideration the combination of motivational engagement approaches with skill-building activities in order to promote positive attitudes and literacy performance simultaneously. This is particularly essential for ensuring that all students are able to unlock their full potential in the development of phonological awareness and literacy skills.

Content Analysis of Teacher-Experts' Feedback on the 3-in-1 Phonological Toolkit Flashcards

In the analysis of the content of teacher-experts' feedback on the 3-in-1 Phonological Toolkit Flashcards, the study used the process of the Qualitative Thematic Approach of Naeem and Ozuem (2022). Figure 4 illustrates the Thematic Analyss process of the responses. The assessment of the reading toolkit from the feedback of five teachers identified some consistent and significant themes that contributed to the overall effectiveness of the reading toolkit. The results are conceptualized in a conceptual framework that identifies four key dimensions*: Relevance to Learners' Needs, Instructional Design Quality, Material Durability and Aesthetics, and Motivation and Engagement*. First and foremost, the reading toolkit was identified as being very relevant to the learners' needs, particularly to struggling readers in the early grades. The teachers identified that the reading toolkit was very effective in addressing the absence of foundational reading materials in schools and that it was a much-needed intervention for Key Stage 1 learners. This alignment is very important in identifying the need for the development of instructional materials that are contextually and developmentally appropriate (Vygotsky, 1978).

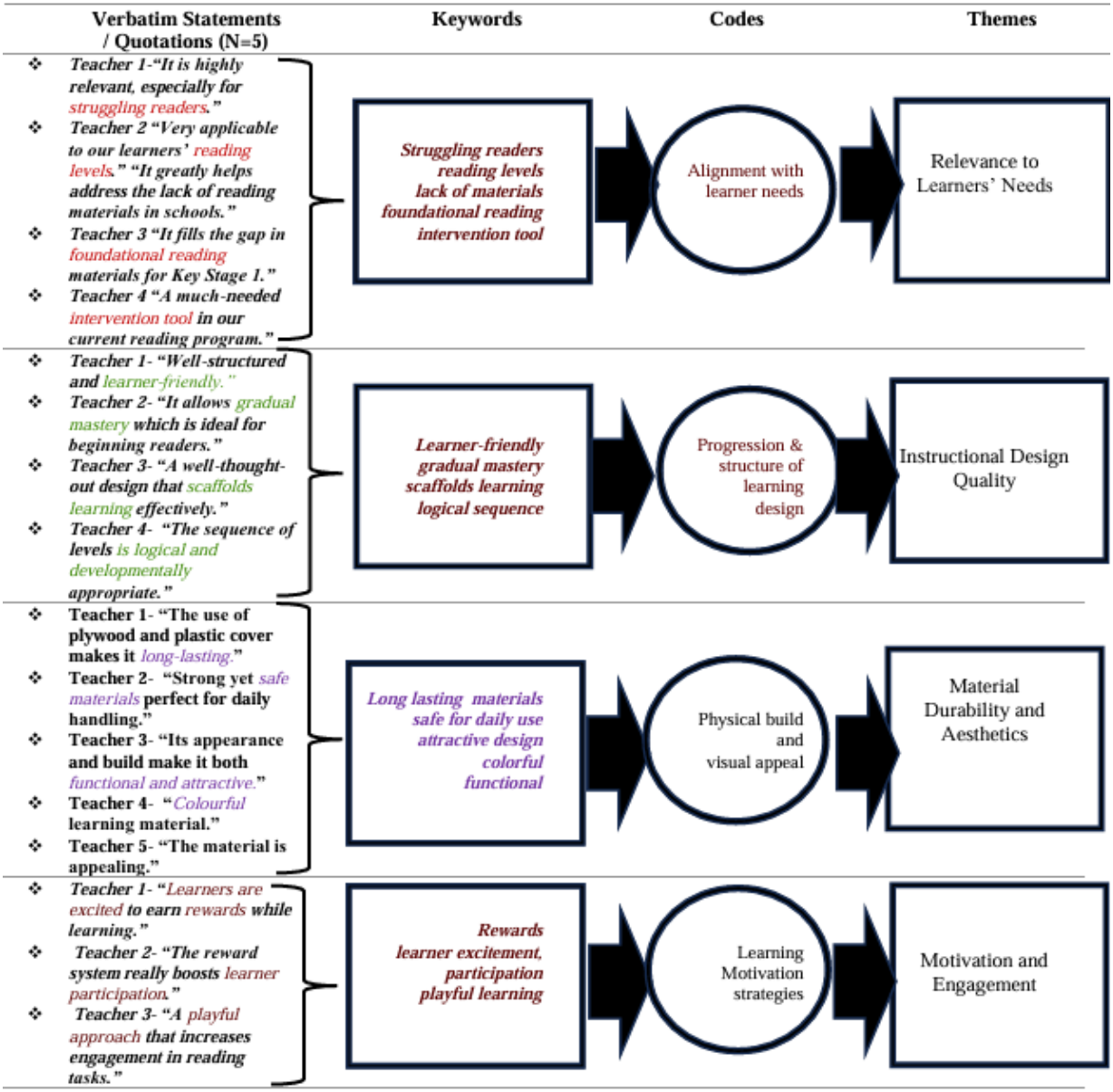

Figure 4. Thematic Approach Used in the Qualitative Component

Regarding the *Instructional Design Quality* of the toolkit, it was praised for its well-organized and learner-centered design. The teachers were impressed with the logical organization and scaffolding design, which enabled them to master reading skills in a step-by-step manner. This is in line with the principles of instructional design alignment and cognitive load theory (Sweller, 2011), which recommend the use of organized learning paths to improve comprehension and retention in young learners. In addition to *Material Durability and Aesthetics*, which was recognized by all five participants as an important factor in making the toolkit usable and attractive. The toolkit's design is not only sustainable in the classroom but also aesthetically pleasing, which can have a positive impact on learner engagement (Burke & Grosvenor, 2003, Clark, 2022).

The *Motivation and Engagement* aspect of the toolkit, specifically the reward system and game-based design, was well received. The teachers observed that there was greater learner engagement and enthusiasm, thus proving the efficacy of intrinsic and extrinsic motivational theories in early literacy interventions (Deci & Ryan, 1985). Play-based learning designs have been long acknowledged as

highly effective in early childhood learning environments.

The study implies that reading toolkits, developed with the sensibility of developmental appropriateness, robustness, and engaging design, can be highly effective literacy interventions in low-resource environments. Educational institutions and policymakers must focus on the development and dissemination of such contextually relevant, learner-focused tools, particularly in the early grades. Moreover, teacher training must focus on the effective use of motivational and contextually relevant tools for early literacy interventions. Future versions of the toolkit could incorporate digital elements or adaptive learning components to increase its accessibility and inclusivity.

However, most of the feedback regarding the toolkit was positive, but 4 out of 5 teachers recommended the inclusion of audio elements such as recorded sounds of letters to assist learners in pronunciation. A teacher stated, "It would be helpful to have recorded sounds for each letter." In addition, 3 teachers recommended the inclusion of interactive elements such as movable components to make learning more enjoyable. A teacher stated, "Movable parts would make it more engaging." To make the toolkit more relevant, 2 teachers recommended the inclusion of reading texts in the local dialect. A teacher stated, "Local dialect texts would connect better with learners."

CONCLUSION

The main purpose of this research was to create and test the effectiveness of a 3-in-1 Toolkit Flashcard based on the ADDIE Model, which was specifically designed to improve phonological awareness skills for Key Stage 1 students (Grades 1-3) in a private archdiocesan school. The study used a Quasi-Experimental Pretest Posttest Design with Non-Randomized Multiple Groups. The findings of this study proved that the 3-in-1 Phonological Toolkit Flashcards are effective in improving the foundational phonological skills of rhyming, blending, and segmenting among Key Stage 1 Learners (Grades 1 to 3) in a private archdiocesan school, with substantial improvements in the performance level of learners and a positive attitude change among them towards phonological tasks. The toolkit is generally a very useful, cost-effective, and evidence-based tool that caters to early literacy skills, promoting both mastery and engagement. The toolkit is designed to accommodate different levels of development and motivate learners, which is in line with the fundamental theories of literacy. The toolkit was found to be relevant, durable, and engaging by the teachers, with suggestions for improvement to include audio components, interactive components, and incorporation of local dialects to make it more culturally interactive. Future adaptations could further expand its impact and accessibility.

RECOMMENDATIONS

Based on the conclusion of the study, the following recommendations are offered:

1. School administrators and curriculum developers are advised to support the integration of localized and multisensory instructional tools such as the 3-in-1 Phonological Toolkit Flashcards.

2. The toolkit provides teachers with an accessible, engaging, and developmentally appropriate resource to support learners' phonological awareness. Its interactive and motivational features are particularly suited for early-grade learners and can be adapted for both classroom and home-based instruction

3. Preservice teachers should be trained in the use of multisensory, culturally responsive phonological tools like the 3-in-1 Toolkit to build competence in early literacy instruction and promote inclusive, engaging learning experiences.

4. Copyright registration of the material may be conducted to warrant mass production for school to use.

5. For further utilization, the toolkit may be enhanced by integrating audio components and digital features,

extending its reach and inclusivity. It may also be adapted for use in other subject areas or tailored to support mother tongue-based multilingual education, addressing linguistic diversity in Philippine classrooms.

6. Design a research results utilization plan to roll out the developed kit.

7. Despite these strengths, the study is limited by its small sample size, single geographic location, and brief implementation period. These constraints may limit the generalizability of the results and call for longitudinal studies involving diverse learner populations to validate and expand the findings.

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