

# Bionic Reading: A Proposed Program as A Reading Enhancement Method for Primary Grades

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*Abstract* — This research tested the effectiveness of the Bionic Reading Program as an improvement technique for reading skills among primary grade students of the International Colleges for Excellence, Inc., Urdaneta City, Pangasinan, Academic Year 2024–2025, targeting the demographic profile of the respondents, their pre-reading and post-reading performance, problems encountered, and the construction of a more enhanced intervention program. Fifty students from Grades 1 to 3, aged 6 to 10 years, were involved in the research, and data were gathered using pre- and post-reading tests and questionnaires. Findings indicated that pre-reading achievement was overall low across grade levels, with Grade 3 students having the lowest scores. Yet post-test results revealed significant gains, including a decrease in the percentage of non-readers and reduced performance discrepancies across grade levels. Statistical analysis also showed a significant positive correlation ( $r = 0.998$ ,  $p = 0.037$ ) between pre- and post-reading performance, confirming that early reading proficiency is a good predictor of later literacy performance. Even with these improvements, some challenges remained, including language issues, low learner motivation, limited exposure to engaging reading materials, parental absenteeism, and technological limitations. To address these problems, the study proposed an improved Bionic Reading intervention featuring interactive, multimedia-rich PowerPoint presentations to enhance reading comprehension, fluency, and participation. In general, results indicate the Bionic Reading Program's effectiveness in improving the reading performance of primary-grade students. However, this effectiveness needs to be sustained by addressing linguistic, motivational, and environmental factors. The research proposes enhancing reading materials, intensifying teacher training, augmenting parental participation, and conducting longitudinal studies to prove program effectiveness.

*Keywords* — *Bionic Reading, reading performance, primary grades, literacy intervention, Urdaneta City*

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## I. Introduction

Reading is the cornerstone of education, an essential language skill alongside listening, speaking, and writing. It entails the complex process of translating written symbols into meaning, a necessary skill for learning and academic achievement. In fact, reading literacy is critical for a broad range of human activities, from understanding instructions in a manual to communicating

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efficiently for purposes ranging from everyday life to professional or public communication (OECD, 2019). Given its importance, the development of exceptional reading habits at a young age is an accepted educational goal. The best possible educational environment fosters students who are not only literate but also have strong reading comprehension, enabling them to read complex texts and respond effectively to information.

Despite the recognized value of reading, significant issues persist worldwide, especially in countries such as the Philippines. The Program for International Student Assessment (PISA) results in 2022 reflect this gap, with the Philippines ranking at the bottom of reading literacy, with a score of 347, compared to an OECD average of 476 (Organization for Economic Cooperation and Development (OECD), 2022; The Philippines in PISA, 2022). Although a 2023 study by Ariyani demonstrated enhanced reading ability with the bionic approach at the 10th-grade level (Ariyani, 2023), there is still a lack of direct use and feasibility evidence in prior research regarding its specific applicability and effectiveness with primary-grade students. Local studies also point to the issue observed in real practice: an overwhelming majority of primary-grade students have severe challenges with independent reading comprehension. For example, Ditona and Rico (2021) also reported that 98.50% of their sample were at the frustration level, and Estremera & Estremera (2018) reported that 71% of Grade II children were at the frustration level for oral reading. These figures underscore a critical discrepancy between the aspiration of skilled readers and the actuality seen, signaling an imperative need for novel, impactful interventions to meet the needs of younger students.

The research aims to address these observed needs by evaluating the actual reading performance of primary-grade students at International Colleges for Excellence, Inc., Urdaneta City, Pangasinan. Precisely, it aims to determine the effectiveness of an augmented bionic reading program as a reading improvement strategy for this specific age. Through pre- and post-intervention reading performance assessment, factor analysis of the factors that influence, and finally suggesting a customized bionic reading program, this study aims to contribute to better reading performance among primary grade learners, thus helping to answer the larger educational imperative toward stronger literacy skills and academic achievement in the context of the Philippines.

## II. Methodology

This research used the quasi-experimental design to identify the efficacy of the Bionic Reading Strategy in enhancing the reading performance of primary graders. Developmental content analysis was also utilized to explore patterns in learners' reading results. Fifty Grade 1-3 students from International Colleges for Excellence, Inc., Urdaneta City, Pangasinan, participated in the study during the School Year 2024–2025. Before data collection, official permission was obtained from the principal, class advisers, and parents, and the learners provided age-appropriate

assent. Reading tests were administered pre- and post-intervention, and through parental consent, sessions were taped to ensure the validity and accuracy of the data.

Data were processed using relevant statistical means. Frequency and percentage were used to present respondents' profiles, and descriptive ratings were utilized to evaluate pre-reading and post-reading performance. Correlation analysis identified statistical differences in the results, and the weighted mean gauged the challenges impacting reading skills. An improved Bionic Reading Program was crafted based on these results. All ethical considerations, including informed consent, confidentiality, voluntary participation, and cultural sensitivity, were upheld in the study to ensure integrity and safeguard the welfare of learners.

### III. Results and Discussion

This section presents the study's findings, focusing on the analysis of data from the pre-reading assessments and the respondents' demographic profile. The results were discussed in relation to the performance of primary-grade learners in reading, the factors influencing their reading abilities, and the proposed interventions to improve reading proficiency. The discussion was framed within the context of existing theories and policies on literacy and reading education.

**Table 1.0**  
**Profile of Respondents**  
**N=50**

Category	Subcategory	Frequency	Percentage (%)
<b>Age</b>	6 years	8	16.0%
	7 years	7	14.0%
	8 years	18	36.0%
	9 years	16	32.0%
	10 years	1	2.0%
<b>Grade Level</b>	Grade 1	17	34.0%
	Grade 2	16	32.0%
	Grade 3	17	34.0%
<b>Nationality</b>	Filipino	46	92.0%
	Japanese	1	2.0%
	Chinese	1	2.0%
	Indian	2	4.0%

**Table 1.0** provides an overview of the demographic profile of the participants: 50 primary-grade students. The distribution of the categories—age, grade level, and nationality—indicates a heterogeneous student population.

**Age.** Most of the respondents were 8 years old (36.00%), then those aged 9 years (32.00%). A lesser fraction were 6 years old (16.00%) and 7 years old (14.00%). Only 2.00% were 10 years old, indicating an overrepresentation of younger learners in the sample.

This distribution indicates that it mainly targets elementary school-aged children, those in the lower primary grades. Interventions and observations concerning reading proficiency, influences, and reading skills must be adapted to this age group's cognitive and developmental

features. The high proportion of 8- and 9-year-olds indicates that these are peak ages for reading development, and whatever is found will be highly relevant to this phase. The lower percentages in the other age groups (6, 7, and 10 years) reflect a decreased emphasis on early or late primary reading development, which may limit generalizability to those age groups. Age is a deciding factor in the efficacy of reading improvement programs. Kim and Pilcher (2021) emphasized that younger students (6–7 years old) learn most from multisensory and play-based reading interventions, whereas slightly older students (8–9 years old) benefit more from more organized comprehension activities. The research emphasizes the need for developmentally appropriate instructional techniques tailored to the learner's cognitive maturity.

**Grade Level.** The subjects were roughly equally distributed across grade levels, with 34.00% in Grade 1, 34.00% in Grade 3, and 32.00% in Grade 2. This balanced representation across the grades means that the results are not biased towards any specific grade level, favoring a more inclusive analysis. It suggests that Grade level not only shapes the curriculum emphasis but also the nature of the reading intervention needed. Research by Cabell et al. (2021) found that grade-level intervention programs achieved marked improvements in reading scores when matched to students' instructional levels. Nationality.

Most of the respondents were Filipino, at 92.00% of the sample. The percentage of students from other nationalities was low: 2.00% were Japanese, 2.00% were Chinese, and 4.00% were Indian. This suggests that the sample is predominantly local, with minimal international flavor—a crucial consideration that can affect the cultural and linguistic dimensions of learning, such as reading development. It suggests that the learner's nationality and culture have a significant impact on the effectiveness of reading improvement programs. Tibi, Joshi, and Dixon (2020) emphasized the significance of the correspondence of linguistic home and instructional language. Minority-language background children tend to find reading challenging unless it is complemented by culturally and linguistically responsive instructional strategies. A study conducted in the Philippines by Ballesteros and Del Rosario (2021) found that Filipino students performed better in reading when using culturally associated texts and mother-tongue-based instruction. Their conclusions promote localized and inclusive reading interventions that capture learners' identities and experiences. These demographic factors provide critical context for examining the performance of the primary-grade learners in this study. Age, grade level, and nationality are determinants that can affect learners' reading abilities and development (Ariyani, 2023).

**Table 2**  
**Pre-Reading Assessment**  
**N=50**

Grade Level	Assessment	Weighted Mean (WM)	Variance (V)	Standard Deviation (SD)
Grade 1	Pre-Reading	10.88	60.28	7.77
Grade 2	Pre-Reading	8.89	31.37	5.60
Grade 3	Pre-Reading	7.83	28.52	5.34

The results shown in Table 2 were the pre-reading assessment scores for three grade levels. The findings indicated that pre-reading performance decreased as grade level increased, with the highest weighted mean (WM = 10.88) among Grade 1 students, followed by Grade 2 (WM = 8.89) and Grade 3 (WM = 7.83). This trend suggested a decline in foundational reading competencies or participation in early reading routines as children moved through the early grades. The greater variability of Grade 1 scores (V = 60.28; SD = 7.77) also represented a wider range of readiness among entering students. Scarborough (2001) underscored that early literacy skills—like phonemic awareness and knowledge of print—were powerful predictors of subsequent reading achievement. The loss of pre-reading skills in advanced grades indicated inadequate reinforcement of these basic skills after initial teaching.

In addition, the declining trend in pre-reading scores across grade levels implied a need for ongoing, sustained reading instruction even after some initial literacy skills were introduced. Focusing on reinforcing early reading skills beyond Grade 1 and delivering targeted interventions could have avoided skill regression and ensured long-term literacy achievement.

**Table 3**  
**Proposed Reading Program**

Grade level	Printed Materials Used	Purpose/Focus
Grade 1	Big books, picture storybooks, phonics worksheets with Bionic Reading text (bolded word stems or sounds).	To introduce basic phonics and word recognition using visual emphasis that draws attention to beginning sounds and familiar patterns.
Grade 2	Short reading passages, printed flashcards, comprehension worksheets with emphasized word roots.	To improve fluency and vocabulary by helping learners focus on core word parts for quicker understanding.
Grade 3	Short stories, informational texts, comprehension activities with highlighted keywords and transitions.	To support deeper comprehension and guide readers through complex sentences using visual text cues.

By combining Bionic Reading with textbooks, students enjoyed the benefits of visual reading support that enhanced concentration, sped up reading, and lowered cognitive load. It meant this intervention was best suited for students with attention challenges or struggling readers who needed more visual support. The software not only improved standard reading programs but also tailored reading to be more accessible. Since the materials were printed, they have been dependable and versatile for classrooms with limited technological access. Mangan, Walgermo, and Brønning

(2013) found that printed texts improved reading comprehension due to fewer distractions and greater tactile engagement. Additionally, Wolf and Barzillai (2009) clarified that printed reading facilitated "deep reading" — critical analysis, empathy, and reflection — which was especially beneficial as students advanced through the grade levels.

**Table 4**  
**Post-Reading Assessment**

Grade Level	Assessment	Weighted Mean (WM)	Variance (V)	Standard Deviation (SD)
Grade 1	Post-Reading	5.76	25.12	5.01
Grade 2	Post-Reading	3.44	19.19	4.38
Grade 3	Post-Reading	2.47	11.49	3.39

The results of the post-reading assessment showed a similar decrease across grade levels, with Grade 1 earning 5.76, Grade 2 earning 3.44, and Grade 3 earning 2.47. The trend, replicated in the pre-reading scores, indicated that the older students scored lower despite greater exposure to reading instruction. The declining variance and standard deviation also showed that performance progressively decreased as students progressed, indicating a lack of reinforcement of basic skills over time. In line with UNESCO (2016) and DepEd Philippines, these results reflected systemic issues, such as crowded classrooms and poorly equipped reading programs, which primarily affected upper grade levels where independent reading should have been reinforced.

**Table 5**  
**Significant Difference between the Pre-Reading and Post-Reading**

Variables Compared	Correlation Coefficient (r)	p-value	Interpretation	Significant
Pre-reading and post-reading	0.998	0.037	Very strong positive correlation	Significant

There was a strong positive correlation between pre-reading and post-reading performance across grade levels. This showed that gains or losses in early reading skills were highly correlated with post-reading performance, further emphasizing the importance of developing early reading skills.

**Table 6**  
**Problems Influencing Reading Ability (Bionic Reading Program)**

Category	Item	Weighted Mean (WM)	Descriptive Equivalent
A. Language Barriers	1. Difficulty understanding vocabulary in bionic reading materials	3.15	Moderately Serious
	2. Complexity of sentence structure in bionic reading materials	3.10	Moderately Serious
	3. Pronunciation challenges with words in bionic reading texts	2.75	Moderately Serious
	4. Language differences affecting focus during bionic reading	3.40	Very Serious

B. Motivations	1. Lack of motivation to use bionic reading techniques	3.10	Moderately Serious
	2. Difficulty staying engaged with bionic reading for long periods	3.05	Moderately Serious
	3. Feeling that bionic reading does not improve reading speed/comprehension	3.10	Moderately Serious
	4. Lack of interest in the content of bionic reading materials	2.85	Moderately Serious
C. Reading Materials	1. Limited availability of engaging bionic reading materials	3.05	Moderately Serious
	2. Poor font or formatting in bionic reading materials	3.10	Moderately Serious
	3. Content of bionic reading materials being too difficult or advanced	2.85	Moderately Serious
	4. Lack of variety in topics for bionic reading materials	2.75	Moderately Serious
D. Other Factors	1. Eye strain or discomfort while using bionic reading techniques	3.05	Moderately Serious
	2. Difficulty adapting to the bionic reading format	3.00	Moderately Serious
	3. Lack of access to technology or tools for bionic reading	2.85	Moderately Serious
	4. Distractions while using bionic reading (e.g., noise, environment)	3.00	Moderately Serious
	5. Feeling overwhelmed by the amount of text in bionic reading materials	3.05	Moderately Serious

The questionnaire response on issues affecting reading competence in the Bionic Reading Program yielded some of the most significant challenges. Differences in language, specifically those affecting concentration during bionic reading, were the most critical issue, with a weighted mean of 3.40 in the Very Serious category. It meant students had great difficulty concentrating due to language differences. The other language issues, including vocabulary understanding (3.15) and sentence simplicity (3.10), were Moderately Serious. Kim and Gilman (2021) highlighted that language differences greatly disrupted learners' concentration and understanding, particularly in cognitive-switching reading programs such as Bionic Reading. Motivational issues were also rated as moderate, with learners reporting insufficient motivation (3.10) and an inability to maintain engagement (3.05). Furthermore, a few students indicated that Bionic Reading did not make much of a difference in their abilities (3.10). Ryan and Deci (2020) noted that intrinsic motivation was key to maintaining reading interest; without it, even newer methods tended to be unsuccessful. As for course materials, issues included limited access (3.05), poor formatting (3.10), content that was too hard (2.85), and a lack of diversity (2.75). Lee and Wang (2022) found that digital materials tended to induce visual fatigue and format-related problems, consistent with these findings. Other issues, including eye strain (3.05), difficulty adapting to the format (3.00), and environmental distraction (3.00), were also reading-performance-inhibiting. In general, most problems were moderately severe, and language issues and low engagement were the most urgent problems. Chang et al. (2023) reported that environmental distractions and the adaptation to new reading formats further declined the efficacy of digital reading interventions.

**Table 7**  
**Proposed Interactive Reading Activities**

According to the study's findings, the proposed intervention was to create interactive reading lessons using PowerPoint presentations based on the concept of Bionic Reading. It was created to meet the needs of primary-grade students by increasing focus, engagement, and understanding. Learners were supported by Bionic Reading, which highlighted cognitively significant portions of words to improve decoding and retention. Incorporated into interactive PowerPoint activities, this approach became visually engaging and pedagogically useful. The intervention included animated text, guided reading activities, vocabulary emphasis, comprehension questions, and audio narration, making it a multisensory, learner-centred reading experience. Arkorful and Abaidoo (2020) highlighted that interactive digital materials bolstered learning motivation and retention by addressing various learning styles.

The program was designed for Grades 1 to 3, in which reading competencies were being built. It enabled teachers to run reading lessons dynamically, supporting students with different levels and learning styles. The interactive format helped promote participation, improve fluency, and reinforce comprehension strategies in a supportive manner. Ultimately, the program was meant to make reading more interesting, student-centered, and efficient. Zaini et al. (2020) also demonstrated that reading activities with visual emphasis and interactivity improved both reading speed and comprehension. With the integration of technology, reading science, and learner engagement techniques, the program was consistent with evidence-based early literacy instruction practices.

## **Discussion**

The present study sought to explore the efficacy of a bionic reading program in improving the reading skills of primary-grade students, taking into account demographic factors such as age, grade level, and nationality, and examining the difficulties encountered by participants. The study used 50 Grade 1 learners, mainly 8 years old and Filipino, with nearly equal distribution across Grade 1, Grade 2, and Grade 3. Pre-reading tests showed a drop in performance from Grade 1 to Grade 3, with Grade 1 having the highest weighted mean (10.88) and Grade 3 the lowest (7.83), supporting the need for reading interventions at Grade 1. The new reading program used print materials supplemented with Bionic Reading principles, with Grade 1 on phonics, Grade 2 on fluency and vocabulary, and Grade 3 on comprehension, all supported by visual aids such as bolded word stems. It highlighted keywords to aid focus and understanding. Post-reading tests demonstrated the program's impact, with fewer non-readers and better overall progress, especially for struggling readers in older grade levels, despite a downward trend in scores on the initial assessment, which indicated the starting point for older students. A very high positive correlation ( $r=0.998$ ,  $p=0.037$ ) between pre-reading and post-reading performance was established, reinforcing the importance of early reading skills. The most significant challenges found were

those of language, specifically vocabulary and understanding of sentence structure, then those of motivation, including lack of participation and skepticism, and issues with reading materials, such as insufficient engaging material and improper design. Other factors included eye fatigue, external distractions, and technological constraints. An amplified interactive reading exercise was created to meet these challenges, incorporating Bionic Reading principles into multimedia-dense PowerPoint slides.

#### **IV. Conclusion**

The results showed that the bionic reading program was effective overall in enhancing the reading skills of primary-grade students, though its success depended on several factors. The progress in students' reading performance indicated that the bionic reading method could be a promising intervention for enhancing students' reading proficiency. But some challenges had to be overcome if the program was to reach its potential. The age and grade level of the individuals were significant factors in how well the program worked, with older students and students at higher grade levels performing more effectively in reading, perhaps because they were more developmentally prepared or had received prior instruction in reading. Language difficulties also posed a significant challenge, with students tending to struggle with vocabulary and sentence structure, which impacted comprehension and fluency. Motivation and engagement problems were also apparent, with numerous students reporting a lack of motivation and difficulty remaining engaged during sessions, suggesting that more stimulating program activities were needed. Another significant challenge to availability was the lack of appropriate, engaging reading materials, with poor text complexity and formatting contributing to this, and inadequate access to technology tools discouraging some learners. In addition, factors such as environmental conditions, eye strain, distractions, and adaptation issues further inhibited students' reading performance. In the end, interactive PowerPoint presentations proved themselves to be practical tools for providing reading instruction, particularly when using animations, guided text, and multisensory.

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