The Development of a Phonics-Based Pronunciation Innovation to Enhance Young Learners' English Pronunciation

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Abstract

This quasi-experimental study employed a one-group pretest-posttest design with 90 Grade 1 students randomly selected from three schools in Nakhon Si Thammarat Province during the first semester of the 2025 academic year. The objectives were to develop a phonics-based pronunciation innovation set meeting the 80/80 criterion, compare students' pronunciation achievement before and after use, and survey their satisfaction. The research tools included the innovation set, pronunciation tests, and a satisfaction questionnaire. The data were analyzed using descriptive statistics, a paired-samples t-test, and effect size. Findings showed that innovation reached an efficiency score of 80.60/80.93, students significantly improved their pronunciation ($t=-12.805$, $p<0.001$, $d=1.46$), and reported the highest level of satisfaction, confirming the innovation's effectiveness and practical value.

Keywords: English Pronunciation, Phonics-based Pronunciation, Primary School Students, Pronunciation Innovation

Introduction

English pronunciation plays a crucial role in language learning and communicative competence, especially among young learners in English as a Foreign Language (EFL) contexts such as Thailand. However, Thai primary students often struggle with pronunciation accuracy due to fundamental differences between the Thai and English phonological systems. Common challenges include difficulties with consonant clusters, vowel quality, and stress patterns, which persist even after several years of English instruction (Khoshmuratovna, 2023; Suminto & Bram, 2021). Although the Basic Education Core Curriculum B.E. 2551 (Ministry of Education, 2017; Ministry of Education, 2021) emphasizes communication skills as a key learning goal, the classroom practices still tend to focus on grammar-based instruction and

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rather than pronunciation development (Dandee & Pornwiriyakit, 2022). Consequently, Thai learners often acquire limited sound awareness and face challenges in producing English sounds correctly and confidently.

A major factor contributing to this issue is the limited implementation of systematic phonics instruction in Thai schools. Phonics teaching, which links letters and sounds to build phonemic awareness, is widely recognized for its effectiveness in helping learners decode, read, and pronounce words more accurately (Ehri, 2020; Gumelar & Lestari, 2024; Putra, 2023). In Thailand, phonics-based activities have been shown to enhance pronunciation clarity and motivation (Dandee & Pornwiriyakit, 2022; Suminto & Bram, 2021). However, despite the proven benefits, many primary schools still lack appropriate phonics-based materials and trained teachers capable of delivering engaging and effective pronunciation lessons.

The theoretical foundation underlying phonics-based pronunciation instruction is deeply rooted in constructivist and cognitive learning perspectives. Vygotsky's concept of the *Zone of Proximal Development (ZPD)* (Vygotsky,1978) explains that young learners benefit most from scaffolded learning experiences guided by interaction and gradual support. Similarly, Bruner's *Theory of Instruction* (Bruner, 1966) emphasizes that structured and sequenced instruction fosters learners' independent understanding through meaningful practice. In addition, Krashen's *Input Hypothesis* underscores (Krashen, 1982) the role of comprehensible input, suggesting that learners acquire language when exposed to meaningful, understandable linguistic input. Together, these theories provide the foundation for phonics-based instruction, which integrates structured sound–symbol relationships, interactive scaffolding, and meaningful exposure through audio-visual materials. Such approaches are especially beneficial for young learners, who require multisensory input and repetition to effectively internalize sound patterns.

The context of this research also highlights a pressing educational need. The participants were Grade 1 students from three primary schools under Thangew Subdistrict Municipality, Nakhon Si Thammarat Province-small public institutions that represent typical Thai rural schools. These schools often lack adequate multimedia resources and teacher expertise in phonics-based pronunciation instruction (Ministry of Education, 2021; Office of the Basic Education Commission, 2010). Consequently, developing a phonics-based innovation tailored to this context can address both pedagogical and resource limitations, supporting teachers and students alike.

To respond to this challenge, the present study developed the *Phonics-Based Pronunciation Innovation Set*, a multimedia tool designed to enhance pronunciation learning through phonics principles. The objectives of the research were threefold: 1) to develop an innovation set that meets the 80/80 efficiency criterion, 2) to compare students' pronunciation achievement before and after using the set, and 3) to examine students'

satisfaction with the innovation. By combining evidence-based pedagogy with technological tools, this study aims to contribute both theoretical insight and practical solutions to improve pronunciation instruction in Thai primary schools.

Literature Review

To develop and evaluate a phonics-based pronunciation innovation, it is essential to review the relevant theoretical foundations and previous studies that inform both the conceptual framework and the design of the innovation. Pronunciation plays a crucial role in developing communicative competence among young learners, particularly in English as a Foreign Language (EFL) contexts such as Thailand, where students often face persistent difficulties in producing English sounds accurately due to differences between the Thai and English phonological systems. Despite the emphasis on communication skills in the Thai Basic Education Core Curriculum B.E. 2551 (Ministry of Education, 2017; Ministry of Education, 2021), pronunciation instruction in many classrooms remains limited, often focusing on rote memorization rather than sound awareness or systematic phonics learning. This lack of structured and meaningful pronunciation instruction underscores the need for innovation that integrates both pedagogical theory and technological design to support young learners' pronunciation development.

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1. Theoretical Foundations

The theoretical foundations underlying this study draw upon several key perspectives in educational and linguistic theory. Phonemic awareness theory emphasizes learners' ability to perceive and manipulate sounds within words, serving as the foundation for both reading and pronunciation development (Ehri, 2020). Through explicit instruction in the relationship between letters and sounds, phonics enables learners to decode, blend, and pronounce words with greater accuracy. In addition, constructivist learning theory, particularly Vygotsky's concept of the Zone of Proximal Development and Bruner's idea of scaffolding, supports the view that language learning occurs through guided interaction, modeling, and gradual transfer of responsibility to learners. When applied to phonics instruction, scaffolding allows teachers to provide step-by-step guidance-from modeling sounds to allowing learners to practice independently-thus aligning instructional processes with developmental learning stages. Krashen's Input Hypothesis further complements this framework by emphasizing that language acquisition occurs when learners are exposed to comprehensible input slightly above their current level (*i+1*). In the context of phonics learning, multimedia resources such as visual cues and audio recordings can serve as effective means of delivering such comprehensible input. Collectively, these theoretical perspectives provide a strong conceptual foundation for the design of the phonics-based pronunciation innovation, ensuring that it is not merely a practical tool but a theory-informed learning intervention.

2. Pedagogical Principles of Phonics-Based Instruction

Phonics-based instruction itself is a systematic and explicit approach that connects the written and spoken forms of language through structured stages of learning. According to Ehri (2020) and Gumelar and Lestari (2024), phonics instruction typically progresses through several key processes: recognizing and distinguishing individual sounds, linking sounds with corresponding letters, blending and segmenting sounds to form or decode words, and applying learned patterns to new vocabulary for pronunciation and spelling accuracy. This multisensory learning process, which involves visual, auditory, and kinesthetic engagement, strengthens learners' phonemic awareness and enables them to internalize sound–letter correspondences. Studies by Dandee and Pornwiriyakit (2022) and Suminto and Bram (2021) have confirmed that phonics-based activities enhance young learners' pronunciation accuracy, fluency, and confidence, especially when combined with multimedia tools that provide repeated exposure and feedback. These pedagogical features align with the constructivist view that knowledge is actively constructed through meaningful, scaffolded practice rather than passive memorization.

3. Related Studies

A number of previous studies provide empirical support for the integration of phonics and multimedia instruction. Putra (2023) reported that systematic phonics training significantly improved early learners' decoding and pronunciation skills, while Gumelar and Lestari (2024) found that students taught through phonics-based lessons demonstrated higher accuracy in producing English sounds compared to those taught through conventional methods. In the Thai context, Srimanothip and González (2021) revealed that computer-assisted phonics games improved both listening and pronunciation among kindergarten students, demonstrating the potential of digital tools in phonics learning. Likewise, Dandee and Pornwiriyakit (2022) observed that phonics-based drills increased articulation accuracy and learner motivation, while Suminto and Bram (2021) found that students taught with phonics materials achieved greater fluency and retention than those relying on memorization-based approaches. These findings collectively highlight the positive influence of phonics instruction on pronunciation development and the growing relevance of multimedia integration in early English education.

4. Synthesis and Research Gap

Despite this substantial body of evidence, previous studies have rarely developed or validated comprehensive phonics-based innovations specifically designed for Thai primary learners. Most research has focused on short-term interventions or isolated instructional activities rather than systematic innovation grounded in theory and evaluated through rigorous research processes. Moreover, while existing studies have shown that phonics instruction enhances pronunciation, reading, and motivation, few have addressed the efficiency and satisfaction dimensions that determine the sustainability of instructional

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innovations. This gap suggests the necessity of designing a contextually appropriate phonics-based pronunciation innovation that aligns with both theoretical frameworks and national curriculum objectives. Such an innovation would not only enhance pronunciation accuracy and learner engagement but also serve as a model for applying phonics and multimedia instruction in Thai primary education.

In summary, the review of literature underscores the theoretical, pedagogical, and empirical basis for developing a phonics-based pronunciation innovation tailored to young Thai learners. The synthesis of theories-phonemic awareness, constructivist learning, and input hypothesis-together with empirical evidence from previous studies, provides the conceptual rationale for innovation development. By bridging the gap between theoretical understanding and classroom practice, this research aims to contribute a validated, efficient, and engaging instructional model that promotes English pronunciation skills in alignment with Thailand's educational policy and EFL teaching goals.

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Methodology

1. Type of Research

This study employed a research and development (R&D) approach focusing on systematic design, expert validation, and field testing to create and evaluate a phonics-based pronunciation innovation for Grade 1 students. A quasi-experimental one-group pretest–posttest design (Boonchom, 2010) was used to determine the effectiveness of the developed innovation in improving English pronunciation. The study was conducted in three primary schools under Thangew Subdistrict Municipality, Nakhon Si Thammarat Province, selected for their similar size, curriculum, and learning conditions. The innovation was integrated into regular English classes during the first semester of the 2025 academic year.

2. Population and Sample

The population consisted of all Grade 1 students enrolled in the three participating schools under Thangew Subdistrict Municipality. The sample comprised 90 students selected through simple random sampling from the population lists provided by each school. The participants were 90 Grade 1 students aged between 6 and 7 years, including 47 girls (52.20%) and 43 boys (47.80%). All participants were native Thai speakers who had learned English as a foreign language for approximately one year. None had received formal phonics instruction before the study. The sampling ensured that all participants shared comparable English learning backgrounds and had no prior formal phonics instruction. Permissions were obtained from school administrators, and ethical approval was granted by Nakhon Si Thammarat Rajabhat University (COA No. 051/2568).

3. Research Instruments, Development, and Quality Verification

The research employed four main instruments: 1) the phonics-based pronunciation innovation, 2) a quality assessment form, 3) an English pronunciation test with a scoring rubric, and 4) a student satisfaction questionnaire.

3.1 The phonics-based pronunciation innovation was a multimedia learning set developed using Canva to enhance young learners' engagement and pronunciation accuracy. Lessons were organized by phonetic patterns appropriate for Grade 1 students rather than alphabetic order. Each lesson integrated audio modeling, guided practice, and pronunciation drills to support retention and self-directed review. The set comprised four sequential lessons-English consonants A-Z, short vowels, long vowels, and diphthongs-providing systematic exposure to essential English sound types. The content and sequence were based on the Grade 1 learning indicators of the Basic Education Core Curriculum B.E. 2551 (Ministry of Education, 2017; Ministry of Education, 2021) and supported by related phonics studies (Ehri, 2020; Suminto & Bram, 2021; Dandee & Pornwiriyakit, 2022). Before implementation, all materials were reviewed by experts in phonetics, instructional design, and English education to ensure content accuracy and pedagogical suitability.

3.2 The quality assessment form was a five-point Likert-scale instrument used to evaluate the innovation's visual design, audio clarity, text quality, content relevance, and overall usefulness. Five experts validated the form, and the Index of Item-Objective Congruence (IOC) ranged from 0.80 to 1.00, confirming strong content validity.

3.3 The English pronunciation test comprised parallel pre-test and post-tests, each containing 10 vocabulary items aligned with the phonics patterns taught in the innovation, such as short and long vowels, consonant blends (two or more consonants pronounced together, often termed consonant clusters in phonology), and diphthongs. To assess transfer rather than memorization, the test items were different from those in the lessons but shared similar phonetic structures. The tested stimuli represented the four target phonics categories covered in the innovation: short vowels (e.g., *cat, bed*), long vowels (e.g., *cake, kite*), diphthongs (e.g., *boat, coin*), and consonant blends (e.g., *flag, drum*). The words were selected based on phonetic simplicity, frequency in beginner-level vocabulary, and alignment with the Grade 1 learning indicators, ensuring equivalent difficulty across the pre- and post-tests while preventing memorization effects. Students read the words aloud and were scored with a three-point rubric (0=incorrect or unintelligible; 1=partially correct; 2=clear and accurate; maximum score=20). The rubric was reviewed by three language-assessment experts, two independent raters, plus the researcher evaluated recorded responses to ensure inter-rater reliability.

3.4 The student satisfaction questionnaire consisted of 12 items on a five-point Likert scale covering four dimensions-content, audio, visuals, and learning benefits. Three experts validated the instrument, and IOC values again ranged between 0.80 and 1.00,

demonstrating strong validity. The development of the innovation and research instruments followed six sequential stages: 1) analysis of students' pronunciation difficulties, 2) design of lesson structures and selection of digital tools (Canva), 3) phonics content review for curricular alignment, 4) prototype design and revision, 5) expert review of media and content quality, and 6) efficiency testing with non-sample Grade 1 learners. The innovation achieved an efficiency score of 80.60/80.93 (E1/E2), exceeding the 80/80 criterion; E1 represented process efficiency during learning, and E2 represented product efficiency after learning. These stages reflected a systematic and theory-driven R&D process ensuring quality and educational effectiveness.

4. Data Collection Procedures

Data collection followed a structured sequence. After obtaining permissions, the researcher explained the objectives and procedures to teachers and students. A pre-test was administered using the validated rubric before instruction. The innovation was then implemented over four consecutive weeks, with one-hour sessions per week during regular English lessons. Teachers used the provided materials and instructional videos, while parents were encouraged to facilitate home practice. After completion, a parallel-form post-test was administered to measure improvement, followed by the satisfaction questionnaire in Thai, assisted by teachers to ensure comprehension. The researcher coordinated all activities, observed implementation fidelity, and collected complete datasets for analysis.

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5. Data Analysis and Reporting

Quantitative data were analyzed using descriptive and inferential statistics. Descriptive statistics-including percentage, mean, and standard deviation-summarized the results of the innovation evaluation and students' satisfaction. Inferential statistics were applied through a paired-samples t-test to compare students' pronunciation performance before and after using the innovation. Cohen's d was computed to measure the effect size, while efficiency indices (E1/E2) were used to determine the innovation's process and product efficiency relative to the 80/80 criterion.

Overall, the research methodology demonstrated a rigorous and systematic process encompassing development, validation, implementation, and evaluation. All instruments were carefully constructed and verified by experts, and all procedures were executed sequentially and transparently, ensuring methodological reliability and alignment with the study's objectives.

Results

Based on the data analysis, the research findings are presented in three main parts as follows.

Part A: Efficiency of the Phonics-Based Pronunciation Innovation Set

To demonstrate the efficiency of the phonics-based pronunciation innovation set, the results are shown in Table 1.

Table 1

Efficiency of the Phonics-Based Pronunciation Innovation Set

Efficiency Level	Full Score	Mean Score	S.D.	Percentage
E1 (Process)	30	24.180	0.98	80.60
E2 (Product)	20	16.186	0.87	80.93

Table 1 shows that the average score for the learning process (E1) was 24.180 out of 30, equivalent to 80.60%, and the average score for the post-instruction assessment (E2) was 16.186 out of 20, equivalent to 80.93%. These results indicate that the innovation set achieved an efficiency level of 80.60/80.93, which exceeds the standard benchmark of 80/80.

Part B: Improvement in Students' English Pronunciation Achievement

To evaluate the effectiveness of the innovation on students' pronunciation ability, their pre-test and post-test results were compared. Table 2 presents the statistical analysis of the improvement in English pronunciation achievement after using the phonics-based pronunciation innovation set.

Table 2

Comparison of English Pronunciation Achievement of Grade 1 Students Before and After Using the Phonics-Based Innovation Set

Test	n	Mean	S.D.	df	t-value / Sig.	Cohen's d
Pre-test	90	12.59	1.89	82	-12.805/0.000	1.46
Post-test	90	15.40	1.94			

Table 2 compares students' English pronunciation scores before and after instruction with the phonics-based innovation set. The pre-test mean was 12.59 (S.D.=1.89), while the post-test mean rose to 15.40 (S.D.=1.94). A paired-samples t-test confirmed significant improvement ($t=-12.805$, $p<0.001$). The effect size (Cohen's $d=1.46$) indicates a large effect (Cohen, 1988), showing the innovation's strong positive impact on pronunciation.

To verify scoring reliability, inter-rater agreement was calculated between two independent raters of students' recordings. Cohen's kappa was 0.82, reflecting high agreement (Landis & Koch, 1977) and supporting the objectivity and consistency of the assessment.

Part C: Students' Satisfaction Toward the Phonics-Based Pronunciation Innovation Set

In addition to efficiency and achievement, students' satisfaction was examined to assess their perceptions and attitudes toward the phonics-based pronunciation innovation. Table 3 summarizes students' satisfaction levels across four dimensions: content, audio, visuals, and learning benefits.

Table 3

Mean and Standard Deviation of Student Satisfaction Toward the Phonics-Based Pronunciation Innovation Set

Item	Statement	Mean	S.D.	Interpretation
	Content			
1	The vocabulary in the exercises is not too difficult.	4.69	0.59	Highest
2	The content of the innovation is interesting.	4.80	0.40	Highest
3	Content and exercises are diverse.	4.59	0.50	Highest
	Audio Components			
4	The word pronunciation audio is loud and clear.	4.78	0.50	Highest
5	The phonics pronunciation audio is clear and well-paced.	4.91	0.42	Highest
6	Pronunciation matches the native speaker's accent.	4.59	0.50	Highest
	Visual Illustrations			
7	The illustrations are appropriately sized.	4.78	0.50	Highest
8	The illustrations are colorful and attractive.	4.93	0.26	Highest
9	Illustrations clearly convey meaning.	4.85	0.34	Highest
	Learning Benefits			
10	Innovation helps pronounce unfamiliar sounds.	4.78	0.49	Highest
11	Innovation improves pronunciation accuracy.	4.81	0.39	Highest
12	Students enjoy learning with innovation.	4.87	0.43	Highest
	Overall	**4.79**	**0.08**	**Highest**

From Table 3, students reported the highest overall satisfaction with the phonics-based pronunciation innovation set (M=4.79, S.D.=0.08). The most highly rated aspect was the attractiveness and vibrant colors of the illustrations (M=4.93, S.D.=0.26). This was followed by the clarity and pacing of the pronunciation audio (M=4.91, S.D.=0.42) and students' enjoyment in learning with the set (M=4.87, S.D.=0.43). All were rated at the highest level.

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Discussion and Conclusion

Based on the data analysis, the findings can be discussed and concluded according to the research objectives as follows:

1. Efficiency of the Phonics-Based Pronunciation Innovation Set

The phonics-based pronunciation innovation set demonstrated an efficiency score of 80.60/80.93, exceeding the standard 80/80 criterion. This result reflects the systematic development of innovation, grounded in phonics instructional principles. According to Ehri (2020), phonics instruction equips learners with a structured understanding of phoneme–grapheme relationships, thereby improving reading and pronunciation. Similarly, Gumelar and Lestari (2024) emphasized that phonics enhances phonemic awareness, enabling accurate blending and segmenting of sounds.

The step-by-step instructional sequence applied in the innovation also aligns with the framework of Dandee and Pornwiriyakit (2022), who argued that clearly sequenced instruction helps learners internalize and apply pronunciation rules effectively. Furthermore, the innovation's interactive and self-guided practice activities reflect Vygotsky's theory of the Zone of Proximal Development (ZPD), in which scaffolding tools-such as multimedia-support learners' progression beyond their independent capabilities.

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Empirical evidence supports this result. Srimanothip and González (2021) found that phonics-based applications significantly increased engagement and accelerated pronunciation improvement compared to traditional methods. Likewise, Suminto and Bram (2021) demonstrated that students learning through phonics applications outperformed those relying on textbooks, particularly in the pronunciation of vowel sounds. These studies confirm that phonics-based multimedia innovations foster both efficiency and learning motivation.

2. Improvement in Students' English Pronunciation Achievement

Students demonstrated significantly higher English pronunciation achievement after using the phonics-based pronunciation innovation set, at the 0.001 level of statistical significance. This indicates that the developed innovation set effectively enhanced students' pronunciation skills. The improvement can be attributed to the systematic development of innovation, which involved careful content analysis, lesson design, the integration of visuals and audio components, expert validation, pilot testing, and efficiency evaluation. The multimedia nature of the set also allowed students to independently practice pronunciation at any time, leading to higher post-test scores. Moreover, the effect size analysis revealed Cohen's d value of 1.46, indicating a large and practically significant impact according to Cohen's (1988) benchmarks.

These findings are consistent with those of Suminto and Bram (2021), who conducted a study on the use of phonics instruction in a Thai school context. The results showed a statistically significant improvement in pronunciation scores after instruction using

phonics-based media. Similarly, Gumelar and Lestari (2024), in their study on phonics instruction for young learners, found that it had a significant positive impact on students' pronunciation and phonemic awareness skills.

Furthermore, the high inter-rater reliability observed in this study (Cohen's kappa=0.82) reinforces the consistency and objectivity of the pronunciation scoring process. The use of two independent raters and audio-recorded responses allowed for unbiased evaluation, thereby increasing the validity and credibility of the test results. This methodological rigor further strengthens the conclusion that the improvement in students' pronunciation performance was both statistically and practically significant.

3. Student Satisfaction Toward the Phonics-Based Pronunciation Innovation Set

Students expressed the highest level of satisfaction with the phonics-based pronunciation innovation set (M=4.79, S.D.=0.08). Item analysis showed the most highly rated aspect was the visual component, particularly colorful illustrations (M=4.93, S.D.=0.26), followed by the clarity and pacing of audio pronunciation (M=4.91, S.D.=0.42), and students' enjoyment of learning (M=4.87, S.D.=0.43). These findings suggest that both visual appeal and audio clarity contributed to engagement, aligning with the instructional media evaluation criteria of the Office of the Basic Education Commission (2010). These criteria emphasize content quality, presentation, instructional support, and learner appropriateness, all of which were effectively met.

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The high satisfaction results are consistent with Suminto and Bram (2021), who reported significant improvement in English pronunciation and high student enjoyment from phonics-based activities. Similarly, Srimanothip and González (2021) found that combining phonics instruction with multimedia improved listening and phonics achievement, while students valued the fun and engaging features of multimedia resources.

4. Implications and Conclusion

The results extend beyond efficiency, achievement, and satisfaction to broader theoretical and practical implications. The improvement in pronunciation supports constructivist perspectives (Vygotsky, 1978), Krashen's Input Hypothesis, and Bruner's scaffolding theory, all of which emphasize structured, supportive, and developmentally appropriate learning environments. The findings confirm that phonics instruction, particularly when combined with multimedia, can be successfully adapted for Thai primary school contexts.

The students' high satisfaction was supported by evidence. After four weeks of using the innovation set, their reading and pronunciation improved significantly, as confirmed by pre- and post-test results with statistical significance at the 0.01 level. Thus, their positive questionnaire responses were consistent with their actual learning progress.

Nevertheless, widespread adoption of such innovations depends on teacher readiness, access to digital tools, and administrative support. In under-resourced schools,

simplified versions of the innovation and targeted teacher training may be necessary to ensure equity. Therefore, sustained policy support and professional development are recommended to maximize the potential of phonics-based pronunciation instruction in improving English language education nationwide.

Summary

Based on the above findings, it is evident that using phonics-based instruction combined with multimedia can effectively enhance students' reading and pronunciation skills in English. Learners were able to pronounce both vowels and consonants accurately according to their corresponding graphemes. From the perspective of the teacher, the phonics-based pronunciation innovation set can be applied in the classroom as a practical and engaging instructional tool. It not only captures students' attention but also facilitates learning and practice, as learners can continue practicing anytime and anywhere. With consistent and regular practice, students are likely to develop more accurate English pronunciation skills while also enjoying the learning process.

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Recommendations

Based on the research findings, the following recommendations are proposed:

Recommendations for Implementation

1. Wider Implementation of Phonics-Based Instruction: Schools should consider integrating phonics-based multimedia materials into the English language curriculum, especially at the primary level, to support the development of pronunciation and reading skills.

2. Use of Multimedia for Independent Practice: The phonics-based innovation set allows students to practice pronunciation anytime and anywhere. Schools and educators should encourage students to engage in regular self-study using multimedia tools, which can lead to consistent improvement over time.

3. Content Expansion: Developers could consider expanding the innovation set to include more complex language elements (e.g., consonant clusters, intonation, and stress patterns) and gamified learning elements to further enhance engagement.

Recommendations for Future Research

1. Long-Term Impact Studies: Future research should investigate the long-term effects of phonics-based multimedia instruction on learners' overall language proficiency, including pronunciation retention, reading comprehension, and vocabulary development.

2. Cross-Skill Integration: Researchers could explore how phonics-based multimedia learning influences other language skills, such as spelling, listening comprehension, and speaking fluency, to gain a holistic understanding of its pedagogical value.

3. Contextual and Technological Expansion: Further studies are recommended to examine the effectiveness of this innovation across diverse educational contexts, age groups,

and proficiency levels. Additionally, integrating emerging technologies such as AI-driven pronunciation feedback systems or adaptive learning platforms could be explored to enhance scalability and sustainability.

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