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ARAL Based Reading Recovery for Foundational Literacy Acceleration

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ABSTRACT

This study investigated the contribution of ARAL-based reading recovery to foundational literacy acceleration among struggling elementary readers in Baggao, Cagayan. A prospective longitudinal intervention-response design was employed involving 28 elementary teachers and 56 struggling readers receiving structured reading intervention. Learner performance was assessed across baseline, early intervention, endline, and maintenance periods, while teacher implementation responsiveness was measured in terms of diagnostic alignment, targeted instruction, foundational skills support, progress monitoring, and instructional adjustment. Bayesian hierarchical growth modeling was used to estimate literacy trajectories and determine whether teacher responsiveness influenced the rate of learner improvement. Results showed substantial gains in overall foundational literacy, with the strongest progress observed in phonological processing and decoding and word recognition. Oral reading fluency and comprehension also improved, although comprehension registered the smallest gain. Teacher implementation responsiveness positively influenced both literacy outcomes and the rate of growth, with learners exposed to higher instructional responsiveness demonstrating greater improvement. A slight decline during the maintenance phase indicated that some gains weakened when intervention intensity decreased. The findings suggest that ARAL-based reading recovery can accelerate foundational literacy when instruction is responsive, closely monitored, and sustained. Continued follow-up sessions, stronger comprehension support, and systematic progress monitoring are recommended to consolidate gains and reduce the risk of reading regression.

Keywords: *ARAL Program, foundational literacy, literacy acceleration, reading intervention, reading recovery, struggling readers*

INTRODUCTION

Reading is one of the first academic abilities that allows children to participate independently in school learning. When learners have difficulty recognizing words, reading with accuracy, and understanding simple texts, the effects extend beyond the language classroom because written materials are also central to mathematics, science, and other learning areas. The World Bank and UNESCO reported that learning poverty remains a serious concern in the Philippines, where a large proportion of children are unable to read and understand an age-appropriate text by the end of primary education (World Bank & UNESCO, 2022). This condition places greater responsibility on schools to identify struggling readers early and provide instruction suited to their actual level of reading development.

The persistence of reading difficulty is also reflected in national performance at later stages of schooling. In the 2022 Programme for International Student Assessment, only 24 percent of Filipino students reached at least

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Level 2 proficiency in reading, compared with the OECD average of 74 percent. Learners below this level may struggle with identifying main ideas, locating information, and interpreting texts of moderate complexity (Organisation for Economic Co-operation and Development [OECD], 2023). Although PISA assesses 15-year-old learners, these outcomes draw attention to literacy difficulties that may have developed much earlier and remained unresolved as learners progressed through school.

Effective reading recovery requires more than additional reading time. Struggling readers need deliberate instruction that responds to specific weaknesses in foundational skills. Evidence-based guidance for elementary reading emphasizes explicit work on sound-letter relationships, decoding, word recognition, oral reading, vocabulary, and comprehension, with instruction adjusted according to learner performance (Foorman et al., 2016). Such an approach positions assessment as part of instruction because teachers need to determine what a learner can already do before selecting suitable reading activities and monitoring improvement.

Focused tutorial support offers another strong basis for reading recovery. A systematic review and meta-analysis of randomized tutoring studies found substantial positive effects on student learning, with stronger outcomes generally observed when tutoring involved teachers or paraprofessionals, occurred frequently, and served learners in the earlier grades (Nickow et al., 2024). These findings support the use of structured and sustained intervention rather than occasional remediation, particularly for children who continue to experience difficulty despite regular classroom instruction.

In the Philippines, this direction is strengthened by the Academic Recovery and Accessible Learning Program. Republic Act No. 12028 established the ARAL Program as a national intervention intended to help learners who struggle to meet expected competencies, particularly in reading, mathematics, and science. Its implementing rules direct schools to provide organized learning interventions for eligible learners, giving reading recovery a clearer institutional basis within basic education (Department of Education, 2025).

Within elementary schools in Baggao, Cagayan, examining how ARAL-based reading recovery contributes to foundational literacy acceleration can provide useful evidence on how intervention is carried out where learning difficulties are directly encountered by teachers and learners. The study therefore focuses on elementary teachers and struggling readers receiving reading intervention, with attention to how structured ARAL-based support may strengthen foundational reading skills and facilitate measurable literacy progress. By linking program implementation with learner improvement, the inquiry seeks to contribute evidence that can guide more responsive reading recovery practices at the school level.

Literature Review

Foundational Literacy Skill Development

Foundational literacy develops through the gradual coordination of phonological awareness, letter-sound knowledge, decoding, word recognition, fluency, and meaning construction. Ehri (2020) explained that beginning readers become more efficient when they learn to connect written letter patterns with their corresponding sounds and meanings, allowing familiar words to be stored and retrieved automatically. This process is particularly important for struggling readers because weak decoding can consume much of the learner's attention and leave fewer cognitive resources for understanding text. Reading recovery programs should therefore strengthen basic word-reading processes systematically rather than rely mainly on repeated exposure to texts. For ARAL-based intervention, attention to these foundational competencies provides a clear instructional starting point for helping elementary learners move from effortful reading toward greater accuracy and independence.

Intensive Reading Recovery for Struggling Readers

Learners who continue to experience reading difficulties often require instruction that is more focused and intensive than regular classroom teaching. Wanzek et al. (2018), in a meta-analysis of 25 studies, found that intensive early reading interventions produced positive outcomes among struggling readers from kindergarten to

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Grade 3. The evidence suggests that additional instructional time becomes more meaningful when intervention is structured around specific reading needs and delivered with sufficient intensity. For struggling readers, recovery is therefore not simply a matter of completing more reading activities but of receiving sustained assistance directed toward skills that remain underdeveloped. This principle closely supports ARAL-based reading recovery because the program provides an opportunity to concentrate instructional support on learners who have not yet attained expected literacy competencies.

Assessment-Guided and Responsive Reading Support

Reading difficulty does not develop in the same way for every learner. Some children may experience difficulty primarily with word recognition, while others may have limitations in vocabulary, language comprehension, fluency, or processes that connect these abilities. Duke and Cartwright (2021) emphasized that reading development involves interacting components beyond decoding and language comprehension alone, including bridging processes and self-regulatory abilities. This understanding makes careful assessment important before and during intervention because learners who appear similarly weak in reading may require different forms of instructional support. Within ARAL-based reading recovery, monitoring learner performance can help teachers adjust lesson focus, pacing, task difficulty, and instructional assistance according to observed progress rather than applying a uniform intervention to all struggling readers.

Teacher-Led Reading Intervention and Literacy Acceleration

The quality of reading intervention depends greatly on how teachers translate evidence about literacy development into daily instructional decisions. Petscher et al. (2020) noted that research on reading provides substantial evidence for early identification of learners at risk, systematic instruction, and intervention practices grounded in established findings about how reading develops. Teachers therefore serve not only as providers of supplementary lessons but also as decision makers who identify learning gaps, select appropriate strategies, observe learner responses, and refine instruction when progress remains limited. In ARAL-based reading recovery, this instructional role is especially significant because literacy acceleration depends on whether intervention activities respond to actual learner needs and are implemented with consistency. Examining teachers alongside struggling readers can consequently provide a fuller account of how the ARAL intervention operates and how instructional practices are associated with literacy improvement.

METHODS

Research Design

The study employed a prospective longitudinal intervention-response design with linked teacher implementation data. Rather than relying on a single pretest and posttest comparison, the design traced changes in foundational literacy across four measurement points: baseline, early intervention, endline, and maintenance assessment. This approach allowed reading development to be examined as a trajectory while learners participated in ARAL-Reading. Teacher implementation data were linked with learner outcomes to determine whether differences in instructional responsiveness were associated with faster literacy growth. The design was appropriate because ARAL-Reading emphasized targeted instruction based on demonstrated reading ability and continuous monitoring of learner progress (Department of Education, 2025a).

Research Locale

The study was conducted in the public elementary education setting of Baggao, Cagayan. The municipality was selected because it had an established elementary education structure under the Schools Division of Cagayan and was included in the implementation environment of the national ARAL Program. Participants were drawn from different areas of the municipality to avoid concentrating the investigation within a single

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instructional setting. No individual school was identified in the reporting of findings to preserve institutional confidentiality.

Participants and Sampling Technique

The participants consisted of 28 elementary teachers and 56 struggling readers, for a total of 84 participants. The teachers were those directly involved in providing reading intervention under ARAL-Reading, while the learners were elementary pupils identified through school reading assessment as requiring targeted reading support and who were actively receiving the intervention. A two-stage criterion-linked sampling technique was employed. Teachers were first selected according to their direct involvement in ARAL-Reading. Two eligible struggling readers were then linked to each participating teacher, giving 56 learner participants. Learner selection considered documented reading difficulty, regular participation in the intervention, availability of baseline reading assessment results, and parental consent. The size was intentionally kept focused to permit repeated individual assessment and close tracking of literacy development.

Research Instrument

Two complementary instruments were used. The ARAL Reading Implementation and Responsiveness Scale contained 25 statements covering diagnostic alignment, targeted instruction, foundational skills support, progress monitoring, and instructional adjustment, rated on a five-point scale. The Foundational Literacy Recovery Battery assessed phonological processing, decoding and word recognition, oral reading fluency, and basic reading comprehension. Its content was aligned with the competencies emphasized in ARAL-Reading and the principle of matching intervention to demonstrated reading ability (Department of Education, 2025b).

The instruments underwent content validation by five specialists in reading education, elementary instruction, educational measurement, and research methodology. The item-level Content Validity Index ranged from .80 to 1.00, while the Scale-Level Content Validity Index based on average agreement yielded S-CVI/Ave = .94, indicating strong content validity. Pilot testing was conducted with 20 elementary teachers and 30 struggling readers who were not included in the main study. The ARAL Reading Implementation and Responsiveness Scale obtained a Cronbach's alpha of .91, demonstrating high internal consistency. The objectively scored components of the Foundational Literacy Recovery Battery produced a KR-20 coefficient of .88, indicating strong reliability. Independent scoring of the oral reading component yielded an intraclass correlation coefficient of .94, demonstrating excellent agreement between raters. Based on the validation and reliability results, the instruments were considered sufficiently consistent and appropriate for final administration.

Data Gathering Procedure

Permission to conduct the study was secured from the appropriate education authorities before participant recruitment. Eligible teachers were oriented regarding the purpose, procedures, confidentiality provisions, and assessment schedule. Parental consent and learner assent were obtained before learner participation. Baseline literacy assessment was administered before the monitored intervention period. Teacher implementation data and the succeeding learner assessments were then collected according to the scheduled intervention checkpoints. The same administration procedures and scoring rules were maintained across measurement occasions. Learners were assigned coded identifiers so that repeated scores could be matched without placing names in the analytical dataset. Completed records were checked for completeness before encoding and analysis.

Data Analysis

The principal analysis used Bayesian hierarchical growth modeling, which was selected because the study involved repeated literacy measurements nested within learners and learner observations linked with participating teachers. Time was entered as a continuous predictor to estimate the rate of literacy improvement across the intervention period. Random intercepts accounted for differences in learners' starting reading levels, while random growth slopes captured individual variation in literacy acceleration. Teacher implementation responsiveness was entered as a higher-level predictor, and its interaction with time determined whether stronger ARAL

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implementation was associated with steeper learner growth. Posterior estimates, 95% credible intervals, and posterior probabilities were reported rather than relying only on conventional significance testing. Standardized change estimates were also computed to indicate the practical magnitude of literacy improvement across assessment periods. This procedure allowed the analysis to distinguish initial reading status from the rate at which individual learners progressed during intervention.

Ethical Considerations

Participation was voluntary and proceeded only after informed consent and learner assent had been secured. Participants were informed that withdrawal carried no academic or professional consequence. Learner names, teacher identities, and school identifiers were excluded from the research dataset and publication. Reading results were used solely for research and instructional interpretation, stored securely, and accessed only by authorized persons. The study also ensured that assessment activities did not reduce learners' access to regular ARAL intervention or other educational support.

RESULTS AND DISCUSSION

Table 1. *Foundational Literacy Performance Across the Four Assessment Points*

Literacy Domain	Baseline M (SD)	Early Intervention M (SD)	Endline M (SD)	Maintenance M (SD)	Net Change Baseline to Endline
Phonological Processing	51.84 (10.26)	62.73 (9.41)	75.68 (8.72)	74.21 (8.95)	+23.84
Decoding and Word Recognition	46.39 (11.12)	57.91 (10.08)	70.46 (9.34)	68.82 (9.71)	+24.07
Oral Reading Fluency	43.76 (10.58)	52.88 (9.87)	63.54 (9.16)	61.13 (9.40)	+19.78
Basic Reading Comprehension	44.63 (10.91)	51.42 (10.14)	61.37 (9.65)	59.46 (9.88)	+16.74
Overall Foundational Literacy	46.66 (9.87)	56.24 (8.92)	67.76 (8.13)	65.91 (8.47)	+21.10

Table 1 presents the literacy trajectory of the 56 struggling readers across the four measurement points. Overall foundational literacy increased from 46.66 at baseline to 67.76 at endline, representing a 21.10-point improvement during the monitored ARAL-Reading intervention. The strongest gains were observed in decoding and word recognition and phonological processing, suggesting that the intervention was particularly effective in strengthening skills that support accurate recognition of printed words. Oral reading fluency also improved substantially, although its gain was smaller than those recorded in the more foundational domains. Basic reading comprehension showed the lowest improvement, increasing by 16.74 points. This pattern indicated that improvements in sound processing and word recognition developed more quickly than higher-order meaning construction.

A slight decline was observed at the maintenance assessment. The overall mean decreased from 67.76 to 65.91, with similar reductions across all four domains. Although maintenance scores remained considerably higher than baseline levels, the decrease suggested that literacy gains were not completely stable once the most intensive phase of intervention had ended. The decline was more pronounced in oral reading fluency and comprehension, indicating that these abilities may require continued guided practice even after learners demonstrate initial improvement. The results therefore supported literacy acceleration while also revealing the need for sustained reinforcement following formal intervention.

Table 2. *Level of ARAL Reading Implementation and Instructional Responsiveness Among Teachers*

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Dimension	Mean	SD	Interpretation
Diagnostic Alignment	4.18	0.46	Strong
Targeted Reading Instruction	4.27	0.43	Strong
Foundational Skills Support	4.31	0.41	Strong
Progress Monitoring	3.76	0.57	Moderate to Strong
Instructional Adjustment	3.89	0.52	Strong
Overall Implementation Responsiveness	4.08	0.39	Strong

Table 2 shows that the participating teachers demonstrated an overall implementation responsiveness mean of 4.08. Foundational skills support obtained the highest mean of 4.31, followed by targeted reading instruction at 4.27. These findings were consistent with the learner results because the largest literacy gains occurred in phonological processing and decoding, the areas most directly supported by explicit foundational reading activities.

Progress monitoring obtained the lowest mean at 3.76. While still indicating generally positive practice, this result exposed a weakness in the continuity of assessment during intervention. Teachers appeared more consistent in delivering reading activities than in documenting small changes in learner performance and using these changes to guide subsequent instruction. Instructional adjustment also scored lower than the direct teaching dimensions. This pattern suggested that the effectiveness of ARAL-Reading depended not only on providing additional instruction but also on how consistently teachers interpreted learner responses and modified intervention intensity, pacing, or task difficulty.

Table 3. *Bayesian Hierarchical Growth Model for Foundational Literacy Development*

Predictor	Posterior Estimate β	Posterior SD	95% Credible Interval	P(β > 0)
Intercept	46.71	1.14	[44.49, 48.94]	1.000
Time	6.18	0.46	[5.29, 7.08]	1.000
Teacher Implementation Responsiveness	2.67	0.88	[0.96, 4.40]	.999
Time × Implementation Responsiveness	1.21	0.39	[0.45, 1.97]	.999
Maintenance Phase	-1.86	0.54	[-2.91, -0.80]	.001*

*For the maintenance coefficient, the posterior probability of a negative effect was .999.

Table 3 presents the Bayesian hierarchical growth estimates for overall foundational literacy. The positive time coefficient of $\beta = 6.18$ indicated that literacy scores increased systematically across the active intervention period. Its 95% credible interval did not include zero, and the posterior probability of a positive effect was 1.000, providing strong evidence that learners demonstrated meaningful literacy growth over time.

Teacher implementation responsiveness also contributed positively to learner performance. The coefficient of $\beta = 2.67$ showed that learners assigned to teachers with stronger implementation practices tended to achieve higher literacy outcomes. More importantly, the interaction between time and implementation responsiveness was positive at $\beta = 1.21$. This indicated that implementation quality affected not only the level of learner performance but also the rate of improvement. Learners receiving more responsive instruction progressed faster during the intervention period.

The maintenance coefficient was negative at $\beta = -1.86$, showing a measurable reduction after the active intervention period. This result reinforced the descriptive findings in Table 1 and identified a practical concern within the recovery process. ARAL-based instruction appeared capable of accelerating foundational literacy, but some gains weakened when intervention intensity decreased. The result suggested that learners who had only recently moved beyond severe reading difficulty may still need scheduled follow-up sessions to stabilize newly acquired skills.

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Table 4. *Estimated Literacy Growth According to Teacher Implementation Responsiveness*

Teacher Responsiveness Level	Estimated Baseline Score	Estimated Endline Score	Estimated Growth	95% Credible Interval for Growth
Lower Responsiveness	46.38	62.41	+16.03	[13.61, 18.49]
Moderate Responsiveness	46.72	67.69	+20.97	[18.82, 23.16]
Higher Responsiveness	47.03	72.84	+25.81	[23.10, 28.54]

Table 4 demonstrates how differences in teacher responsiveness translated into differences in literacy acceleration. Learners receiving instruction from teachers in the higher responsiveness range gained an estimated 25.81 points, compared with 16.03 points among learners exposed to lower responsiveness. Because estimated baseline scores were relatively similar across the three groups, the wider endline difference was unlikely to be explained solely by initial reading ability. Instead, it reflected differences in the pace of recovery during intervention.

The gap of nearly 10 points between the higher and lower responsiveness groups represented one of the clearest findings of the analysis. Stronger implementation appeared to amplify the benefit of ARAL-based reading recovery. However, the lower-performing implementation group still demonstrated improvement, indicating that participation in the intervention itself was beneficial. The difference lay in the magnitude and speed of progress. The finding therefore emphasized that program availability alone was insufficient. The instructional quality with which teachers diagnosed needs, targeted foundational skills, monitored progress, and adjusted support shaped how rapidly struggling readers advanced.

Table 5. *Standardized Magnitude of Change in Foundational Literacy Domains*

Literacy Domain	Standardized Change	Magnitude
Phonological Processing	2.19	Very Large
Decoding and Word Recognition	2.20	Very Large
Oral Reading Fluency	1.82	Large
Basic Reading Comprehension	1.54	Large
Overall Foundational Literacy	2.01	Very Large

Table 5 shows that the intervention produced a very large standardized change in overall foundational literacy. Decoding and word recognition registered the strongest standardized improvement at 2.20, closely followed by phonological processing at 2.19. These findings indicated that ARAL-based reading recovery was particularly successful in accelerating skills closest to the mechanics of beginning reading.

Despite its large standardized gain, comprehension remained the weakest domain. This finding was important because improved decoding did not automatically produce equivalent progress in understanding connected text. Some learners had become more accurate and efficient readers but continued to experience difficulty deriving meaning, connecting ideas, and responding to comprehension questions. The result identified a continuing instructional problem that could persist even when basic word-reading skills improve. Future ARAL sessions would therefore need to move gradually from foundational decoding work toward vocabulary development, oral language, guided comprehension, and repeated engagement with meaningful texts.

Taken together, the findings showed that ARAL-based reading recovery was associated with substantial acceleration in foundational literacy among struggling elementary readers. The strongest evidence emerged in phonological processing and decoding, while teacher implementation responsiveness significantly strengthened the rate of learner improvement. However, the modest decline during the maintenance phase and the comparatively slower growth in reading comprehension indicated that recovery remained incomplete for some learners. The intervention was therefore most effective when intensive foundational instruction was accompanied

by consistent progress monitoring, instructional adjustment, and continued support after initial reading gains had been achieved.

CONCLUSION

ARAL-based reading recovery contributed substantially to foundational literacy acceleration among struggling elementary readers in Baggao, Cagayan, particularly in phonological processing, decoding, and word recognition. Learners demonstrated clear progress across the intervention period, while stronger teacher implementation responsiveness was associated with faster literacy growth. However, the smaller gains in reading comprehension and the decline observed during the maintenance phase showed that recovery was not fully sustained for all learners. It is therefore recommended that ARAL-Reading implementation retain intensive foundational skills instruction while strengthening comprehension-focused activities, vocabulary development, and guided meaning-making. Teachers should also use more systematic progress monitoring and instructional adjustment so that intervention intensity can be modified according to learner response. Follow-up reading sessions should continue after the formal intervention period to prevent regression and consolidate gains, while school-level support should provide teachers with practical tools, coaching, and sufficient instructional materials for sustained reading recovery.

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