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EPS SPIRE K-5 Efficacy Study

2024-2025 Randomized Control Trial with Intervention and Special Education

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Abstract

This randomized controlled trial examined the effectiveness of SPIRE® 4th Edition, an Orton-Gillingham-based reading intervention, for Tier 3 and special education students in grades K-5. The study included students across 20 schools in an urban Kentucky district, with participants assessed using the Amira Reading Mastery (ARM) scores at the beginning and end of the 2024-2025 school year. Students receiving SPIRE instruction demonstrated significantly greater literacy gains than their control-group peers across grades. Qualitative feedback from educators highlighted the program's systematic structure, multisensory approach, and digital components as key strengths, while identifying Reading Assistant implementation and time constraints as primary challenges. Findings suggest that SPIRE's structured, multisensory approach effectively addresses reading difficulties in high-need populations. The study noted the opportunity for further research to study impacts on subgroups within intervention and Special Education, such as English learners. The findings provide strong evidence for SPIRE's effectiveness while highlighting the importance of comprehensive teacher training and consistent implementation for optimal outcomes.

Keywords: SPIRE, reading intervention, SPED, Orton-Gillingham, phonics instruction, literacy outcomes, randomized controlled trial, Structured Literacy

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Introduction

Background

Supporting and supplementing early reading development with quality instruction is essential. In 2024, the average reading score in fourth grade declined from 2022 and was similar to the first reading assessment in 1992 (NAEP, 2024). Students at the 10th and 25th percentiles were lower in 2024 than in 1992, highlighting the urgent need for effective reading instruction. In recent years, research on early literacy and reading has provided clearer specifications about reading development, converging on three themes that have gained widespread acceptance: reading is a strategic process, and fluent readers need instruction and practice employing a variety of strategies to understand text (Juel & Minden-Cupp, 2000), reading instruction should be differentiated to meet the needs of individual students (Spiro, 2001), and the reader's ultimate goal is comprehension of the meaning of text in light of prior knowledge and purpose (Filderman et al., 2022).

The SPIRE curriculum is built on all three themes. SPIRE® 4th Edition incorporates the core principles of the Science of Reading (The Reading League, 2022) and is an evidence-based, explicit, direct, and systematic Orton-Gillingham reading intervention program. Strategies for successful reading are introduced through direct, explicit teacher-led instruction that is systematically planned and organized, allowing students to practice in monitored reading situations. The lessons are sequenced in a way that moves from simple to complex. Lessons in SPIRE draw students back to the core of what reading is all about, employing newly learned strategies in real reading situations to comprehend text.

The Individuals with Disabilities Education Act (IDEA, 2004) encourages the use of Response to Intervention (RTI), mandating that schools provide a more intensive level of instruction when a student's response to research-based general classroom instruction is unsatisfactory. RTI is a problem-solving approach that proactively utilizes performance data to inform decisions for instruction, rather than waiting for students to fail on high-stakes tests before providing services. It includes early intervention to prevent reading failure and offers timely support for struggling learners and special education students, compared to past policies (Gersten & Dimino, 2006). SPIRE operates within an RTI system to identify students who are striving and serves as a model of instruction to provide support, teaching, and assessment of progress.

SPIRE has been helping schools/districts make significant learning gains in reading throughout the United States for over 30 years and is currently listed as an approved reading intervention program in many states.

Program Description

SPIRE 4th Edition by EPS Learning is a comprehensive, research-based reading intervention program designed to help striving readers from pre-K through grade 8+ to achieve literacy success. Grounded in the Orton-Gillingham approach, this structured, multisensory program provides explicit, systematic instruction in phonological awareness, phonics, fluency, vocabulary, and comprehension in a teacher-led 10-step lesson plan. SPIRE includes a rigorous placement process and continual formative assessment to individualize instruction to students' specific instructional needs. The 4th Edition includes updated lesson plans, digital resources, and engaging activities, including a wide variety of reading and writing practice. The program includes at least four reinforcing lessons for each concept, allowing educators to reteach multiple times when a student is struggling.

Educators can also provide optional digital practice through EPS Learning's Reading Assistant. This digital tool offers real-time reading practice and immediate feedback through voice recognition, allowing students to build fluency and confidence (EPS Learning, 2025a). With data-driven assessments and progress monitoring tools, SPIRE ensures personalized instruction tailored to meet individual needs, helping educators deliver targeted instruction for Tier 2 and Tier 3 intervention and special education.

While SPIRE is most appropriate for striving readers in Tiers 2 and 3, the program has been used in a variety of settings, including whole classroom, small group, or one-on-one. The depth, nature, and intensity of skill reinforcement available in SPIRE provide the resources needed to differentiate instruction.

Study Context

The present study was conducted by a team of independent researchers at LXD Research to examine the impact of SPIRE 4th Edition on student literacy achievement across grades. LXD examined program implementation and collected feedback from educators about ease of use, program quality, and impact. For this study, a mixed-methods approach was used, incorporating student academic outcomes data and educator feedback via surveys. Together, these data sources helped LXD to document evidence of impact on student outcomes, describe SPIRE implementation and literacy programs in schools, and document evidence of the relationship between implementation and outcomes.

Method

Sample Description

The study included an urban school district in Kentucky and an analytic sample of 362 Grade K-5 high-needs students who were identified as either Tier 2, Tier 3, or special education across 20 schools. Of the 362 students in the study, 338 had outcome data at both BOY and EOY, as well as relevant demographic data, and were thus included in the final analytic sample. Due to the relatively small sample size in each grade level, inferential statistical analyses were conducted *across* grades K-5 and by relevant grade bands to ensure sufficient statistical power. Treatment and control groups had similar demographic characteristics, except for gender and ELL status; the treatment group had a higher proportion of female students and a lower proportion of ELL students (for details, see Tables 1-3).

Table 1. Analytic Sample Distribution by Grade Level

Grade Band	Treatment	Control	Total
Grade K	8	21	29
Grade 1	14	14	28
Grade 2	26	19	45
Grade 3	35	42	77
Grade 4	41	38	79
Grade 5	47	33	80
All Grades K-5	171	167	338

Table 2. Analytic Sample Distribution by Grade Band

Grade Band	Treatment	Control	Total
Grade K	8	21	29
Grades 1-2	40	33	73
Grades 3-5	123	113	236
All Grades K-5	171	167	338

Table 3. Demographics of Analytic Student Sample

Demographics	Treatment	Control
Female	40%*	32%
Free/Reduced Lunch	75%	73%
ELL	16%*	29%
At Dyslexia Risk	51%	47%
Race/Ethnicity		
White	40%	32%
Black	32%	37%
Hispanic	14%	20%
Two or More	9%	8%
Other	5%	3%
Primary Disability		
Mild Mental Disability	12%	12%
Speech or Language Impairment	0%	1%
Emotional-Behavioral Disability	2%	0%
Other Health Impairment	15%	15%
Specific Learning Disability	39%	30%
Multiple Disabilities	2%	0%
Autism	24%	30%
Developmental Delay	7%	12%
None of the Above	1%	1%

Assessments

Participants were assessed for reading proficiency in Fall 2024 and Spring 2025 using an adaptive reading diagnostic measure developed by Amira Learning, which is incorporated into the Reading Assistant platform. The assessment is used for universal screening, dyslexia screening, progress monitoring, and placement testing, covering skills from phonemic awareness to reading comprehension (EPS Learning, 2025b). The Reading Assistant composite score is the Amira Reading Mastery Score, derived from 5 to 10 tasks related to Oral Reading Fluency (ORF) subdomains, including Words Correct Per Minute (WCPM), Adjusted WCPM, ESRI, Phonetic Awareness, and Vocabulary. Adjusted WCPM was also a key outcome in our analysis of reading outcomes for this study.

Amira's assessment tool demonstrates robust psychometric properties as a reading assessment tool, having been included among the universal reading screeners approved by, among others, the Georgia State Board of Education, following rigorous psychometric review (Morgan et al., 2024). The assessment meets established benchmarks for educational screening instruments, with adequate internal consistency and test-retest reliability coefficients. Its concurrent validity was established through correlations with established reading measures, and its predictive validity for identifying students at risk for reading difficulties meets robust screening standards (Morgan et al., 2024). Furthermore, the automated scoring system has demonstrated high inter-rater reliability with human scorers, providing consistent measurement of oral reading fluency and comprehension skills across diverse student populations, and the platform aligns with the National Reading Panel's five pillars of reading while providing grade-level benchmarks calibrated against national norms.

Analysis Plan

The experimental, mixed-method design assessed Amira Reading Mastery (ARM) EOY scores and Fall-Spring change. The district identified groups of schools that were similar to each other in terms of demographics and achievement, then researchers randomly assigned one pool of schools to use SPIRE and the other pool to be the control group. This approach allowed for analysis of both the overall program effectiveness and identification of student populations who may benefit most from the structured, multisensory reading intervention. As such, t-tests and ANCOVA analyses were conducted to determine differences in reading outcomes. Due to relatively small sample sizes for each grade, all inferential analyses were conducted at Grades K-5 combined, rather than by grade level. Qualitative analysis of educator survey data was primarily conducted with thematic analysis of educator feedback in the educator survey.

Baseline Equivalence

What Works Clearinghouse requires baseline equivalence between treatment and control groups, as pre-existing differences could account for observed outcomes rather than the intervention itself—without equivalent starting points, any post-test differences may simply reflect initial group disparities rather than treatment effects (What Works Clearinghouse, 2022). Baseline equivalence of overall ARM scores was assessed at the first measurement time point, Fall 2024. Baseline ARM mean scores for the analytic sample were .19, which is below the maximum of .25 SD, and no statistically significant differences in ARM baseline scores were found (see Table 4, below). Therefore, this study established baseline equivalence between the two conditions.

Table 4. Fall 2024 Baseline ARM Scores of analytic sample by Condition

Group	N	Mean	SD	p	Mean Difference	Mean difference / pooled SD	Equivalent?
Treatment	173	2.01	1.50	.06	.29	.19	Yes
Control	167	1.72	1.42				

Differential Attrition

An additional What Works Clearinghouse standard includes the examination of differential attrition. When treatment and control groups lose participants at different rates, it can introduce selection bias that threatens the study's internal validity. That is, students who remain in one condition may systematically differ from those in the other, potentially confounding treatment effects with participant characteristics (What Works Clearinghouse, 2022). From fall 2024 to spring 2025, attrition in the current study was minimal (less than 8% for each condition) on ARM scores, and differential attrition between conditions was at an acceptable level (3.3%), well below the maximum threshold of 15% differential attrition. For full details, see Table 5, below.

Table 5. Fall 2024 Baseline ARM Scores by Condition

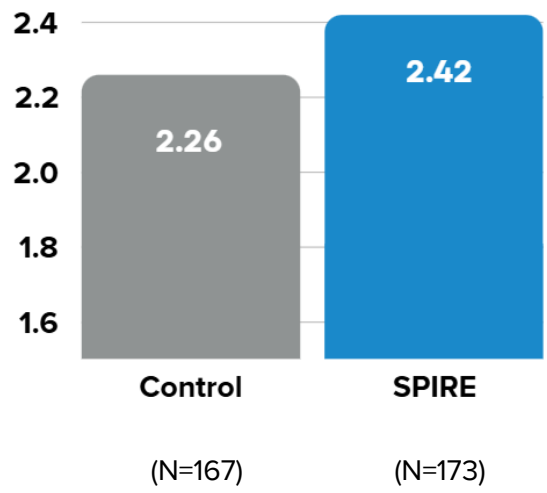
Condition	BOY Complete	BOY & EOY Complete	Attrition (n)	Attrition Rate
Control	181	167	14	7.7%
Treatment	181	173	8	4.4%
Total	**362**	**340**	**22**	**3.3% differential**

Quantitative Results

Student Outcomes

The primary reading outcome of interest in this study was the Amira Reading Mastery (ARM) scores. We began by conducting an ANCOVA analysis to determine ARM scores at EOY, after accounting for covariates of gender and baseline scores. Across Grades K-5 combined, average treatment group EOY scores were significantly higher (2.42) than average control group scores (2.26), after controlling for baseline scores and gender ($F(1, 334) = 4.5$, $p = .03$, $\eta^2 = .013$, Cohen's $d = .234$). This finding is meaningful because it shows that students who used SPIRE had stronger overall reading proficiency outcomes than their control group peers, even after adjusting for baseline differences and demographic factors. For full details, see Figure 1 below, and Table A1 in the Appendix for statistical modeling details.

Figure 1. Mean ARM Score by Condition



Note: Estimated marginal means are adjusted for baseline ARM score and gender.

Qualitative Results

Program Strengths and Most Valued Components

Digital Technology Integration and Online Platform

The digital and online components emerged as a prominent strength, with most teachers particularly valuing the platform's accessibility and visual display capabilities. The SPIRE STAR digital features addressed modern classroom needs by enabling teachers to display lessons on interactive boards, significantly reducing preparation time while increasing student engagement through visual learning. Teachers reported that the technology integration proved especially valuable in special education settings where visual supports and real-time progress monitoring can enhance learning outcomes. One educator emphasized: *"The most helpful components were the digital lesson and online tracker because I was able to display the lessons during instruction."* Another noted the motivational impact: *"The online component is so user-friendly and the students love seeing their real-time percentages on the assessment portions."*

Multisensory Learning Through Manipulatives

The magnetic letter boards and manipulative sets were overwhelmingly cited as the most engaging program elements, with consistent reports of increased student enthusiasm and participation. This multisensory approach aligns with evidence-based practices for special education, particularly for students with dyslexia and other reading difficulties who benefit from tactile and kinesthetic learning experiences. The physical manipulation of letters helps students internalize phonemic patterns by making abstract concepts concrete and memorable. Teachers consistently observed high engagement, *"My students LOVED the letter boards and word building,"* and *"The kids also really love the magnetic manipulative letters on the magnetic boards. They like to bring the letters down and spell with them."* The tactile nature of these materials appeared to transform potentially frustrating phonics practice into game-like learning experiences, reducing anxiety around spelling mistakes while encouraging experimentation with word construction.

Systematic Structure and Comprehensive Material Alignment

The program's organized, systematic approach and well-aligned materials provided essential scaffolding for both teachers and students. The structured, scripted lessons reduced cognitive load for students who often struggle with executive functioning, while the predictable routine helped build confidence and independence. For teachers, this structure ensured implementation fidelity and reduced planning burden, allowing them to focus on student responses and differentiation. As one educator explained, *"One of the aspects that I found really*

helpful about the SPIRE program is that there's a routine and consistency. My kids grew to know what to expect throughout the lesson."

The seamless integration between teacher materials, student workbooks, and decodable readers eliminated the common frustration of mismatched resources. This alignment proved particularly crucial for special education teachers who need to document progress for IEP goals and provide consistent practice opportunities. Teachers appreciated that *"the workbooks, and how aligned they are to the teacher's manual, lessons. It was good to have something all flow and match."* The decodable readers provided controlled text aligned with taught phonics skills, offering successful reading experiences that built student confidence.

Implementation Challenges and Barriers

Pacing, Repetition, and Time Constraints

While SPIRE's systematic repetition is research-based for students with dyslexia, some teachers found the pacing too repetitive or slow for certain students, particularly those with milder reading difficulties or specific skill gaps. One teacher noted it was *"repetitive with resource 5th-grade students who may be advanced for their individual level."* This suggests a need for clearer guidance and professional development on acceleration options for students demonstrating quick mastery.

Additionally, the comprehensive nature of SPIRE lessons often exceeded typical special education service delivery time blocks. Teachers reported prioritizing core lesson components over supplementary materials like decodable readers or digital practice. As one educator explained: *"I also have not used the illustrated decodable books that came with the program because we just don't have enough time."* Again, this suggests a need for clearer guidance and professional development on the flexible delivery model that allows lessons to be structured into smaller timeframes.

Resource Limitations and Material Access

Practical implementation challenges included insufficient copies of decodable readers for small group instruction and misalignment between digital and physical materials. Teachers specifically requested: *"The packet of decodable readers that you only get one book of each is not very helpful in a group. Maybe having at least six of each one."* The inability to send materials home limited practice opportunities and parent involvement, both crucial for intensive intervention. Additionally, inconsistencies between online platforms and printed materials created confusion, particularly problematic when teachers needed to switch between formats for different students or assessment situations. Schools have the option of purchasing additional copies of the decodable readers to address this need.

Optional Reading Assistant Implementation

Educators discussed which students benefited most from the automated Reading Assistant tool, and which types of students required human-led, ORF practice with corrective feedback. Several teachers noted that, while Reading Assistant worked well with many of their students, other students with the most severe speech impediments in their classrooms were sometimes frustrated by the program's inability to consistently recognize their words. One teacher mentioned these challenges: *"A lot of my students have speech impediments as well as low voice level or different accents, and it's very hard for them to get through a lesson."* Therefore, Reading Assistant was recommended for students without significant speech impediments who could fully benefit from Reading Assistant. Teachers using SPIRE should therefore consider students' speech fluency when considering assignment to the Reading Assistant tool.

Professional Development Impact and Training Effectiveness

Building Teacher Confidence and Competence

The professional development program demonstrated significant success in building teacher capacity, with many respondents reporting improved confidence levels in supporting special education students following training. The training successfully equipped teachers with concrete tools and systematic approaches that translated directly to classroom practice. For many special education teachers, having a structured, research-based program with comprehensive training reduced the anxiety of designing interventions independently. One teacher reflected: *"I think my comfort level has increased quite a bit because before I didn't really have a program that focused on phonics and beginning reading."* Another noted, *"I feel that I have been given lots of additional tools for teaching my struggling readers how to decode."*

Value of Hands-on Training and Ongoing Support

Teachers consistently identified hands-on practice and modeling as the most valuable components of training. The experiential nature of the training proved crucial for understanding not just what to teach but exactly how to deliver instruction effectively. Watching expert trainers demonstrate lessons and receiving feedback bridged the gap between theoretical knowledge and practical application. As one participant shared: *"I think the training being all day and super hands-on and having all the materials for all of us to work with was very beneficial."*

The coaching model with follow-up support significantly enhanced implementation quality by providing personalized feedback within teachers' actual classroom contexts. This ongoing support helped teachers refine their practice while maintaining fidelity to the core methodology: *"I've had the coach come in and watch me teach it with my students and give me feedback. I*

found that that was super helpful." Teachers also valued having multiple colleagues trained on the same program, creating opportunities for peer collaboration and problem-solving.

Training Gaps and Timing Challenges

Despite overall positive feedback, teachers identified critical training needs. The most consistent request focused on conducting training before the school year begins rather than during implementation. Current timing created challenges as teachers had to simultaneously learn the program while teaching students. One educator explained: *"I think because those weren't done at the beginning of the year, that it was difficult to implement them once we had already started."*

Additionally, several teachers reported needing more support with assessment and placement procedures. The complexity of accurately placing students in appropriate SPIRE levels appeared to be a significant challenge, with teachers recognizing that incorrect placement could undermine the entire intervention. As one teacher articulated: *"I think where I have difficulties in what I would need more help with...is doing those initial tests to see where students lie and where to start the student at their level."*

Student Outcomes and Evidence of Effectiveness

Documented Academic Improvements

Teachers observed concrete, measurable improvements in foundational reading skills, including enhanced decoding abilities, increased word reading accuracy, and improved fluency. The systematic phonics approach of SPIRE appeared to produce genuine skill acquisition rather than rote memorization, with students successfully applying learned patterns to novel words. Teachers documented these gains through multiple measures: *"The students are reading words and sentences with more fluency. They are also applying the phonics they are learning in writing/spelling."* Another educator reported comprehensive improvements: *"Their reading fluency has gotten a lot better and their comprehension has gotten a lot better just by being consistent with following the SPIRE program."*

Progress was particularly notable for students who began with minimal literacy skills: *"Now they can confidently identify letters, key words, and letter sounds when shown a letter card,"* demonstrating the program's effectiveness with beginning readers in special education settings.

Affective Outcomes: Confidence and Engagement

Beyond academic metrics, teachers consistently noted significant improvements in student confidence and attitudes toward reading. This affective dimension proved particularly important for special education students who often carried histories of reading failure and associated anxiety. The structured success experiences provided by SPIRE appeared to rebuild students' self-efficacy, creating a positive cycle where increased confidence led to greater engagement and continued progress.

Teachers observed transformative changes in student attitudes: *"I've also seen my kids' confidence with reading get better. Like they don't dread coming and doing reading with me anymore."* Students began actively seeking reading instruction: *"My students look forward to coming to my small group reading lesson and ask at the end of each lesson what the next lesson will be."* This shift from avoidance to anticipation represented a crucial foundation for long-term reading success.

Differential Progress and Individual Variations

While documenting overall success, teachers maintained realistic assessments of differential progress across skill areas. Some students showed strong decoding gains but limited fluency improvement, while others struggled with the program's pace. One teacher noted: *"The only one that I haven't really seen a huge increase based on this intervention is their reading fluency."* Another observed challenge with readiness: *"My lower group on a kindergarten level does not do as well because the program introduced CCVC and CVVC words before they are ready."*

These reflections suggest teachers were using multiple indicators and maintaining realistic expectations while recognizing that no single program serves all students equally. The evidence indicates SPIRE is generally effective for most students, but may need adjustments for students at the extremes of the ability spectrum.

Overall Program Evaluation and Recommendations

High Satisfaction Despite Challenges

The overwhelming majority of educators expressed high satisfaction with SPIRE and plans to continue implementation. This positive evaluation occurred despite the specific challenges identified, suggesting that the program's strengths significantly outweighed its limitations. Teachers appreciated the comprehensive nature of the program and how it filled gaps left by other reading interventions. One veteran educator stated: *"I think it brings more into a reading program than any other reading program I've taught in my 19 years of special ed."*

The program's ability to engage students while producing measurable results drove teacher satisfaction: *"Overall, I've really enjoyed my experience with SPIRE this year. The kids do love the lessons."* Teachers particularly valued having multiple intervention components integrated into one systematic program, reducing the need to piece together materials from various sources.

Need for Flexibility and Teacher Autonomy

While appreciating the structured approach, teachers emphasized the importance of adapting the program to individual student needs. This tension between program fidelity and differentiation reflected the reality of diverse learner needs in special education settings. Teachers valued maintaining professional judgment about implementation: *"Reading intervention should be targeted to meet student deficit areas and defined needs as laid out in the individualized education plans."* Another emphasized: *"Not all programs are appropriate for every student. Special education teachers are taught how to select the most suitable program, and this autonomy should be respected."* Successful implementation appeared to require balance, as one teacher noted: *"We have been able to make it our own while staying true to the program."*

Priority Recommendations for Enhancement

Based on the comprehensive feedback, several key improvements would enhance program effectiveness:

1. **Technology Use**: Educators should be selective about which students use the Reading Assistant tool, ensuring that students' articulation issues don't create frustration with a voice recognition approach..
2. **Strengthen Comprehension Components**: Develop more robust and engaging comprehension materials to bridge the gap between learning to read and reading to learn, particularly crucial for special education students who struggle with both decoding and understanding.
3. **Ensure Resource Adequacy**: Provide multiple copies of decodable readers for small group instruction and take-home materials to support practice and parent involvement. Address inconsistencies between digital and physical materials.
4. **Optimize Professional Development**: Conduct initial training before the school year begins, provide comprehensive assessment and placement training, and maintain ongoing coaching support throughout implementation.
5. **Support Implementation Flexibility**: Provide clear guidance for adapting lessons to varying time constraints, student attention spans, and ability levels while maintaining program integrity.

6. **Expand Age-Appropriate Options**: Consider developing materials and pacing guides specifically for older elementary students with significant reading delays to address age-appropriateness concerns.

The qualitative findings demonstrate that SPIRE successfully provides a structured, evidence-based reading intervention that produces measurable student gains in both academic skills and reading confidence. The program's multisensory approach, systematic structure, and comprehensive materials create an effective framework for special education reading instruction. However, addressing technological barriers, resource limitations, and implementation challenges while maintaining flexibility for diverse learner needs would significantly enhance the program's effectiveness across special education settings.

Discussion

The findings from this randomized controlled trial provide compelling evidence that SPIRE® 4th Edition significantly predicts literacy outcomes for Tier 3 and special education students across grades K-5 in a predominantly Title I district context. Students who received SPIRE instruction demonstrated significantly greater gains on the Amira Reading Mastery (ARM), representing a meaningful educational impact for this population of striving readers.

The differential impact observed across grade levels warrants careful interpretation. Students in grades K, 4, and 5 showed the strongest relative gains, while the effects in grades 1-3 were more modest. This pattern suggests that SPIRE's structured approach may be particularly well-suited for foundational skill building in kindergarten and for addressing more complex reading challenges in upper elementary grades. The relatively smaller effects in grades 1-3 may reflect the developmental trajectory of reading acquisition, where multiple instructional approaches can yield similar short-term results, whereas systematic interventions like SPIRE demonstrate their value over longer periods.

The qualitative feedback from educators reinforced the quantitative findings by providing crucial implementation insights. Teachers consistently reported that SPIRE's systematic structure and explicit teaching methods helped them deliver more targeted instruction to striving readers. The program's assessment tools enabled more precise identification of student needs, while the sequential lesson structure provided clear pathways for skill development. Educators particularly valued the program's flexibility, allowing them to adjust pacing based on individual student progress. However, the implementation data also revealed important considerations for program success. Teachers emphasized that SPIRE's effectiveness depended heavily on consistent implementation and adequate professional development. Several educators noted the initial learning curve required to effectively use the program's assessment and instructional

components. This finding underscores the importance of comprehensive training and ongoing support for successful SPIRE implementation.

The study's focus on Tier 3 and special education students represents a critical strength, as these populations often show limited response to less intensive interventions. The positive effects observed across this high-need population suggest that SPIRE's Orton-Gillingham foundation and multisensory approach effectively address the instructional needs of students with significant reading difficulties. This finding has important implications for RTI implementation, suggesting that SPIRE can serve as an effective Tier 3 intervention that may reduce referrals to special education services.

Limitations

Several limitations should be considered when interpreting these findings. Special education studies are typically quite small and include detailed documentation of the interventions provided. Implementation data were not available for this study, representing a practical challenge in determining how exactly the program was implemented across participating schools. While we documented overall program delivery, more granular data about session frequency, group sizes, and lesson duration would enhance understanding of optimal dosage parameters. Similarly, systematic documentation of control group activities, while challenging in authentic school settings, would strengthen the interpretation of the specific mechanisms driving SPIRE's effectiveness.

The absence of systematic classroom observations, while understandable given resource constraints, limits our ability to identify which specific lesson components were most consistently implemented. Educators reported adapting lessons due to time constraints, and understanding these adaptations could inform future program refinements. However, the positive outcomes observed suggest that teachers were able to implement SPIRE's core elements effectively despite these practical adjustments.

The study's single-district focus, while providing important contextual depth, suggests caution in generalizing findings to all settings. However, the demographic diversity within this urban county in Kentucky and the economically disadvantaged context strengthen confidence that findings may apply to similar high-need districts. The grade-band analyses necessitated by sample size considerations provide meaningful insights while acknowledging that grade-specific effects warrant further investigation. Likewise, the relatively small percentage of ELL students in the sample represents an area for future research rather than a fundamental limitation. The study's one-year timeframe appropriately documents immediate intervention effects while pointing to valuable longitudinal follow-up opportunities.

Conclusion and Next Steps

This randomized controlled trial demonstrates that SPIRE® 4th Edition significantly improves literacy outcomes for striving readers in grades K-5, providing strong evidence for the program's effectiveness as a Tier 3 intervention. The study's findings support SPIRE's continued use in Title I districts serving high-need student populations, particularly for students requiring intensive reading support. The randomized controlled design, proper implementation controls, and statistically significant positive findings indicate strong evidence of program efficacy. This designation supports SPIRE's use with federal Title I funding and positions it as an evidence-based intervention for districts seeking to improve outcomes for striving readers.

Future Research Priorities

Several research directions would strengthen the evidence base for SPIRE implementation. Implementation fidelity studies should document session parameters and conduct systematic classroom observations to identify consistently delivered versus modified components. Additional implementation research could determine which specific SPIRE elements drive effectiveness, potentially leading to more efficient program versions.

Multi-district longitudinal studies would enhance generalizability and examine the long-term sustainability of gains. Focused research on ELL populations with adequate sample sizes represents a critical priority, as does dosage-response research examining optimal delivery parameters for resource allocation decisions. The evidence positions SPIRE as an effective intervention for elementary striving readers, with continued research and implementation support enhancing its contribution to improved literacy outcomes for high-need student populations.

Key Implications for Practice

Educational leaders should consider several factors when implementing SPIRE. First, the program's effectiveness appears to depend on consistent implementation and comprehensive teacher training. Districts should invest in thorough professional development and provide ongoing coaching support to maximize program benefits. Second, the differential effects observed across grade levels suggest that implementation strategies may need grade-specific adjustments, particularly for supporting ELL students who may require additional language scaffolds.

The study's findings also suggest that SPIRE can serve as an effective component of comprehensive RTI systems, potentially reducing the need for more intensive special education services by providing systematic intervention at Tier 3. However, successful implementation requires district commitment to fidelity monitoring and teacher support.

Educator-Recommended Program Enhancements

Based on educator feedback collected during implementation, several program expansion opportunities emerged that could strengthen SPIRE's effectiveness:

- **Early intervention expansion**: Implementation at younger grade levels (pre-K) for earlier identification and intervention
- **Enhanced foundational support**: Including alphabet review options within SPIRE for students with more significant skill gaps
- **Sound Sensible enhancements**: Adding vowel sounds to the Sound Sensible component to strengthen phonemic awareness instruction
- **Technology access**: Continued district-wide access to online components to support consistent implementation across settings

These educator-recommended enhancements reflect practical insights from classroom implementation and suggest areas where program modifications could address observed student needs more comprehensively. The fact that most teachers reported planning to continue SPIRE use and advocated for expanded implementation speaks to the program's practical utility and educator acceptance in participating schools.

The evidence presented in this study positions SPIRE 4th Edition as a valuable tool for supporting striving readers in elementary settings. With appropriate implementation support and continued research attention, SPIRE can contribute meaningfully to efforts to improve literacy outcomes for students who need intensive intervention support.

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Appendix

Supplemental Table

Table A1. ANCOVA Comparisons: Grades K-5 Combined

Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2 g$
sex	6.020×10^{-4}	1	6.020×10^{-4}	0.001	0.97	4.104×10^{-6}
treatment_control.x	1.995	1	1.995	4.543	0.034	0.013
AmiraScore.x	583.527	1	583.527	1329.48	< .001	0.799
Residuals	146.708	334	0.439	-	-	

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