Received: 1 February 2022 | Revised: 28 May 2022 | Accepted: 28 June 2022

DOI: 10.1002/pits.22773

RESEARCH ARTICLE

WILEY

Evidence of efficacy of the *Integrated Literacy Study Group* professional learning program to enhance reading instruction for students with emotional and behavioral disorders

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Funding information

National Center for Special Education Research, Institute of Education Sciences

Abstract

This article reports on a pilot study of the *Integrated Literacy Study Group*, a digitally delivered professional learning intervention to prepare elementary school teachers to provide evidence-based reading instruction and behavioral strategies to students with or are at risk for emotional and behavioral disorders. Using broadcast methods, we recruited 72 teachers across five states in the western United States to participate in the randomized controlled trial. Intervention teachers, relative to controls, made significant gains in self-efficacy and use of the reading and behavioral strategies learned in the professional learning program. Students with or at risk of emotional and behavioral disorders served by participating teachers made significant improvements in academic competence and engagement. Teacher professional learning can improve teacher knowledge of evidence-based reading and behavioral strategies for students with (or at risk for) emotional and behavioral disorders, teacher self-efficacy, and teacher practice, with positive impacts on student early literacy and academic competence.

KEYWORDS

educator professional learning, literacy, reading intervention, teacher coaching, teacher training

1 | INTRODUCTION

Most students with or at risk for emotional and behavioral disorders (EBD) experience significant challenges with literacy, with devastating effects on school and life success, such as poorer academic achievement, greater risk for dropout, and greater conduct and social problems (Garwood, 2018). Research indicates that tailored reading interventions support the academic and behavioral needs of students with or at risk for EBD, but teachers rarely receive training to implement such intensive instruction (Bradley et al., 2008). This study evaluates the effects of the *Integrated Literacy Study Group* (*ILSG*) program, an online course to help teachers enhance reading instruction for students with or at risk for EBD.

1.1 | Reading and social and emotional learning (SEL) needs for students with or at risk for EBD

There is growing evidence that students with or at risk for EBD respond to effective reading instruction (e.g., Benner et al., 2022; Nelson et al., 2005). Reviews of the reading literature for students with or at risk of EBD identify moderate to large effect size estimates for both group and single-case studies and reading interventions delivered via core, explicit, supplemental, and individual instruction (Benner et al., 2010; Garwood, 2018; Nelson et al., 2011). Despite these demonstrated positive effects, as well as federal legislation mandating effective education for students with disabilities (Every Student Succeeds Act, 2015; Individuals with Disabilities Education Act, 2004) and guidance from state-level initiatives to provide effective core reading instruction to all students (National Governors Association, 2010), students with or at risk of EBD often do not receive reading instruction that is appropriate for their special needs. They are usually taught in general education classrooms for most of the day, where they typically receive the same reading instruction as their peers, even though research shows they may not respond to interventions without strong SEL support during instruction (Al Otaiba & Fuchs, 2002; Nelson et al., 2005). Problem behavior is related as strongly to intervention effectiveness as rapid naming and phonological core deficits, which are fundamental reading skills (Nelson et al., 2005; Wagner & Torgesen, 1987). Social, emotional, and behavioral supports reduce student misbehavior and improve engagement (Goddard et al., 2004; Gresham, 2015; Jennings & Greenberg, 2009), which enhances access to reading instruction (Schaubman et al., 2011). Despite evidence that students with or at risk for EBD respond to social, emotional, and behavioral supports (Al Otaiba & Fuchs, 2002; Kern, 2015), teachers are generally ill-equipped to address academic deficits and manage challenging classroom behaviors simultaneously (National Council on Teacher Quality, 2014; Shapiro et al., 1999; Slate et al., 2019). Faced with challenging behaviors, teachers often allow students with or at risk for EBD to avoid reading activities (e.g., sending them to office, escalating prompts), which only exacerbates problems.

Researchers of recent longitudinal investigations have found that students with EBD display the slowest growth trajectories in reading when compared with their grade-level counterparts (Yakimowski et al., 2016). The reading achievement gap widens from about two grade levels below peers in the elementary years to an average of 3.5 years behind their high school counterparts (Adamson & Lewis, 2017). The reading achievement scores of students with EBD do not usually improve over time, even though students with learning disabilities show significant improvement across the elementary school years (Anderson et al., 2001). Poor reading skill has long-term implications for school and life success. Reading problems compound negative outcomes for students with or at risk for EBD, including poorer academic achievement, greater dropout, more conduct and social problems, and higher likelihood of untoward postsecondary outcomes (Marchand-Martella et al., 2013; Rumberger et al., 2017). The learning and life outcomes of these students are bleak.

1.2 | Professional learning needs for teachers of students with or at risk for EBD

Attentional and behavioral challenges exhibited by students with or at risk for EBD must be addressed to improve their reading instruction and outcomes. Teachers need a new instructional approach to support them in this study. Schools are expected to provide in-service teachers with high-quality ongoing professional learning to improve the academic achievement of all students, including those with disabilities such as EBD. But educators receive limited professional learning in this area (Bradley et al., 2008). Teachers consistently report being underprepared to meet the behavioral needs of students with or at risk for EBD (Gable et al., 2012). Educators are struggling to incorporate evidence-based reading practices (e.g., Lemons et al., 2016) and behavioral supports (Gable et al., 2012) into their classrooms.

To close the gap between evidence-based reading instruction for students with or at risk for EBD and what these students typically receive, educators need professional learning programs that provide effective reading routines and address the behavioral issues inhibiting instruction. High-quality, continuing professional learning can hasten the translation of research to practice, promote educators' knowledge and skills, and boost student outcomes (e.g., Moss et al., 2008). To build educator capacity in reading instruction, training and coaching should be ongoing, job-embedded, data-driven, and collaborative (Joyce & Showers, 2002).

1.3 | Integrated Literacy Study Group intervention

ILSG is a digitally delivered professional learning program for elementary school educators. It combines behavior support with high-quality reading instruction to improve educational outcomes for students with or at risk for EBD. The program's innovative design integrates: (a) systematic and explicit reading instruction for small groups (Fien et al., 2015), (b) guidance about how to effectually tailor literacy instruction to elementary students with or at risk for EBD and how to use behavioral strategies to improve student readiness to learn (Cook et al., 2003), and (c) evidence-based professional learning approaches such as teacher study groups and personalized coaching (Gersten et al., 2010).

1.3.1 | Conceptual framework

Consistent with research on professional learning (Desimone, 2009), the *ILSG* course was designed to train teachers in effective reading instruction, as well as the use of SEL and behavior strategies, to improve reading performance of students with or at risk for EBD. *ILSG* implementation achieves these outcomes with: (a) effective online professional learning, (b) collaborative peer support through teacher study groups, and (c) coaching with individualized, ad hoc feedback.

1.3.2 | Effective online professional learning

ILSG is delivered online on an interactive, collaborative platform. Increasingly, educators are turning to web-based professional learning to improve their skills (Parsons et al., 2019). Research evidence indicates that online learning can produce comparable or better results than face-to-face training (Dede, 2006; Kennedy, 2016; Lauer et al., 2005; Parsons et al., 2019; U. S. Department of Education, 2009). Its appeal includes: (a) flexibility to access materials at any time (Bartley & Golek, 2004; Parsons et al., 2019), (b) ability to tailor the pace to fit personal needs (Parsons et al., 2019), (c) access to resources not locally available, and (d) extended opportunities for learning (Dede, 2006; Lauer et al., 2005; Treacy et al., 2002). *ILSG* incorporates five hallmarks of effective

professional learning: (a) focus on student outcomes (Dole, 2003; DuFour & Eaker, 2005); (b) integration of conceptual and procedural knowledge (Dole, 2003; Gersten et al., 2010), promoted via teacher discussion and video-recorded rehearsal of how to implement strategies; (c) easily applied instructional practices (Baker et al., 2004; Fuchs et al., 1997; Gersten et al., 2010); (d) modeling and active learning, including the ability to observe teachers adopting and performing routines (Bandura, 1986), video examples (Pianta et al., 2008), interactive practice and feedback (Joyce & Showers, 2002), and multiple access points to various training formats (e.g., modeling, coaching, and resource libraries); (e) sufficient duration and intensity for lasting impact (Garrett et al., 2019), with a minimum of 14 h of focused activities (Gersten et al., 2010); and (f) personalized coaching. Short-cycle professional instruction (<30 h), such as the *ILSG* course, can have a greater impact on student reading performance and educator learning than longer, more-intensive interventions (Garrett et al., 2019). Professional development is most successful when learners understand the purpose of the activities, receive demonstrations of desired behaviors, get opportunities to practice skills and work collaboratively, and receive feedback (Salas et al., 2012). These elements are all incorporated into the *ILSG* online platform, but are not always offered to teachers in the limited time available in traditional face-to-face professional learning workshops, seminars, and conferences.

1.3.3 | Collaborative peer support through teacher study groups

Through teacher study groups, *ILSG* educators work online collaboratively with colleagues to reflect on their current practices; plan implementation of the research-based reading and use of social, emotional, and behavioral approaches; personalize the intervention to fit their classroom settings and students with or at risk for EBD; and give feedback. In-person teacher study groups are an evidence-based, empirically validated approach for building capacity to implement and sustain effective classroom practices (Gersten et al., 2010). Although research about online teacher study groups is sparse, this approach offers convenience, ongoing instruction, discussion among teachers, and support for educators that traditional approaches cannot provide (Moss et al., 2008).

1.3.4 | Coaching with personalized feedback

Peer coaching is built into *ILSG* to improve the quality of implementation (Joyce & Showers, 2002) and to give personalized feedback (Diamond & Powell, 2011), which can produce larger impacts than structured feedback (Garrett et al., 2019). Educator coaching is effective in improving educator reading instruction (Kraft et al., 2018). Intensive, ongoing support may be particularly critical for teachers of students with intensive reading and behavioral needs. Coaches may also provide models and opportunities to practice. *ILSG* educators receive coaching as individuals and in teacher study groups.

1.4 | *ILSG* development and feasibility study

ILSG was developed over 2 years, and then evaluated in a feasibility study in typical elementary school settings. Using a within-subjects pre-post design with 13 elementary school teachers (Benner et al., 2022), the feasibility study showed that the *ILSG* intervention was implemented with fidelity, and that participating teachers made significant gains in their sense of self-efficacy for classroom management, instructional strategies, and student engagement; in their confidence in teaching reading skills and using behavior-management skills with their students with or at risk for EBD; and in their knowledge of evidence-based behavioral and reading strategies for

students with or at risk for EBD. Teachers gave the *ILSG* moderately high marks for social validity, with average ratings of 3.71– 4.17 (on a scale of 1–5) for compatibility with classroom goals, ease of use, effectiveness in teaching students, and overall program satisfaction.

1.5 | Present study

The present study builds on the feasibility study by evaluating the efficacy of *ILSG* with a randomized controlled trial (RCT). The RCT addresses four research questions:

(1) What was the impact of *ILSG* on teacher self-efficacy, and on teacher knowledge of evidence-based reading and behavioral supports for students with or at risk for EBD?
(2) To what extent did teachers find the *ILSG* program satisfactory and usable?
(3) What was the impact of *ILSG* on reading skills and engagement of students with or at risk for EBD?

We hypothesized that *ILSG* teachers, relative to controls, would improve general teacher self-efficacy, reading self-efficacy, and social and emotional self-efficacy, and increase knowledge of evidence-based SEL and reading strategies for students with or at risk for EBD (Research Question 1). We also hypothesized that teachers would find the professional learning program satisfactory and usable (Research Question 2). Finally, we hypothesized that *ILSG* teachers, relative to controls, would report greater improvements in engagement and academic outcomes for their two selected students with or at risk for EBD (Research Question 3).

2 | METHOD

The efficacy and usability of *ILSG* was evaluated using a pre-post, RCT design. The study was conducted in 2018–2019 with a sample of teachers and their students recruited, using broadcast methods, from every elementary school and every school district across five states (Oregon, Washington, California, Arizona, and Nevada). The study did not recruit multiple teachers/classrooms within schools. We assessed changes in teacher self-efficacy and knowledge. We also evaluated teacher-reported engagement and reading skills for selected students with or at risk for EBD.

2.1 | Participants

Seventy-four elementary school teachers completed the 12-week study: 31 randomly assigned to the *ILSG* intervention and 43 to the wait-listed control group. *ILSG* teachers were randomly assigned to seven learning groups of four to five teachers each. Random assignments were made using a computer algorithm. Table 1 summarizes participating teacher and student characteristics. Teachers averaged 41.5 years old (SD = 10.2; range= 23–62) with 12.3 years of teaching experience (SD = 8.1; range = 1–36). Most had a graduate degree, most were female, and most identified as White/Caucasian. About half were specialists and about half were general educators. At the start of the study, teachers were moderately confident in their ability to meet the needs of their students with or at risk for EBD (M = 3.65; SD = 0.93 on a 5-point Likert-type scale). Each teacher selected two students with or at risk for EBD to participate in this study. With guidance from project researchers, teachers nominated students who most exhibited the emotional and behavioral characteristics of EBD.

TABLE 1 Participant characteristics

Measure	*Mean*	*SD*
Teachers (N = 74)		
Age (years)	41.5	10.2
Years teaching	12.3	8.1
	n	***%***
Gender		
Female	68	91.9
Male	5	6.7
Transgender	1	1.4
Education		
Associate degree	2	2.7
Bachelor's degree	19	25.7
Graduate degree	53	71.6
Ethnicity		
Latino/a or Hispanic	5	6.8
Non-Latino/a or Hispanic	69	93.2
Race		
White/Caucasian	56	75.7
Black/African American	7	9.5
Asian	3	4.0
American Indian/Native American	1	1.4
Other	2	2.7
Multiracial	3	4.0
Did not answer	2	2.7
Position		
Classroom teacher	41	55.4
Behavior specialist	33	44.6
Grade(s) taught (Could be ≥1 grade)		
Kindergarten	19	
First	23	
Second	28	
Third	29	
Fourth	30	
Fifth	33	
Students (N = 148)		
Gender		
Female	43	28.7

TABLE 1 (Continued)

	n	%
Male	104	69.3
Transgender	1	0.7
	Mean	***SD***
Age (years)	8.41	1.8
Grade		
Kindergarten	19	12.7
First	14	9.3
Second	29	19.3
Third	19	12.7
Fourth	33	22.0
Fifth	34	22.7
Ethnicity		
Latino/a or Hispanic	33	22.0
Non-Latino/a or Hispanic	109	72.7
Race		
White/Caucasian	69	46.0
Black/African American	36	24.0
Asian	4	2.7
Native Hawaiian/Pacific Islander	3	2.0
Other	24	16.0
English as a second language	12	8.0
Individualized education program	67	44.7

2.2 | Measures

Measures were aligned with the research questions. Educators completed measures about their self-efficacy and knowledge in the fall and spring.

2.2.1 | Teacher knowledge

To measure teacher knowledge of evidence-based reading and behavioral practices for students with or at risk for EBD, we used a 28-item knowledge assessment developed during the 2-year development of *ILSG* that was employed in the prior feasibility study. Items assess knowledge of best practices in reading instruction and behavior intervention. For example, "Asking students to identify the sounds in the word 'cat' is an example of:" with the correct answer being "phoneme segmentation" and incorrect answers being "phoneme blending," "alphabetic blending," and "alphabetic segmentation." The teacher knowledge measure demonstrated good internal consistency (α = .83 at pretest; α = .87 at posttest).

2.2.2 | Teacher self-efficacy

We used three measures of teacher self-efficacy. To measure general teacher self-efficacy, we used the Teacher Sense of Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001). The TSES is a 24-item Likert-type scale developed for educators to assess their confidence in three areas of teaching: (a) classroom management, (b) instructional strategies, and (c) student engagement. Example items include "How much can you do to get through to the most difficult students?" Respondents answer items on a Likert-type scale ranging from 1 (*nothing*) to 9 (*a great deal*). The developers reported acceptable internal consistency (overall $\alpha = .94$; subscale $\alpha = .87$ for student engagement, .91 for instructional strategies, and .90 for classroom management). Construct validity (Tschannen-Moran & Woolfolk Hoy, 2001) and discriminate validity data indicate the scale to be psychometrically sound.

We also used two assessments of self-efficacy created by the research team specific to the skills taught in the *ILSG* program: (a) the Teacher Reading Self-Efficacy Scale (TRSES), a 7-item Likert-type scale that measures confidence in teaching reading to students with or at risk for EBD, and (b) the Teacher Behaviour Self-Efficacy Scale (TBSES), an 8-item Likert-type scale reflecting teacher confidence using behavior-management skills with their students with or at risk for EBD. Both demonstrated strong internal reliability ($\alpha > .91$), reasonable concurrent validity with the TRSES ($r_{(72)} = .54$, $p < .001$) and TBSES ($r_{(72)} = .65$, $p < .001$), and sensitivity to intervention.

2.2.3 | Teacher practice

Impact of the *ILSG* innovation on teacher practice was documented with measures of user satisfaction and implementation.

2.2.3.1 | *User satisfaction*

We developed a 21-item survey to measure user satisfaction with the *ILSG* program as a whole, as well as specific aspects of the program: relevance, practicality, usability, ease of use, engagement, level of detail, and program content and duration. Items were rated on 3-point or 5-point Likert-type scales, with higher ratings indicating more favorable perceptions.

2.2.3.2 | *Implementation*

We used the Concerns-Based Adoption Model (CBAM; American Institutes for Research, 2018) to document the implementation process. CBAM is a conceptual framework for facilitating and assessing new interventions. Two of its three components were used in this study. (a) the Stages of Concern component, which includes a 35-item questionnaire, open-ended questions, and a semistructured branching interview to identify participant attitudes and beliefs about the new program; and (b) the Levels of Use component, which relies on an interview to determine how well the new program is being implemented by users. Interviews were conducted by a research assistant, trained to fidelity on the administration of the CBAM, after teachers completed Module 4 and Module 10 of the *ILSG* course. The CBAM scale demonstrated good internal consistency ($\alpha = .94–.96$).

2.2.4 | Student outcomes

Each teacher completed assessments on two selected students with or at risk for EBD.

2.2.4.1 | *Student academic engagement*

Teachers completed the 73-item Academic Competence Evaluation Scales (ACES; DiPerna & Elliott, 2002) at the beginning and end of the intervention to evaluate student academic engagement in reading instruction. Items are

rated on a 5-point Likert-type scale, and then averaged to create subscale scores. This instrument measures proficiency in reading/language arts, mathematics, and critical thinking, as well as four academic enablers: engagement, motivation, interpersonal skills, and study skills. The engagement subscale was used in the present study. Engagement items included "asks questions when confused," "assumes leadership in group," and "reads aloud," with the following frequency ratings: 1 (*never*), 2 (*seldom*), 3 (*sometimes*), 4 (*often*), and 5 (*almost always*). Studies of score internal consistency (>0.90), test–retest reliability (0.88 to 0.97), and convergent and construct validity show the ACES possess adequate psychometric properties (DiPerna & Elliott, 2002).

2.2.4.2 | *Student reading performance*

Student reading performance was measured using the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002). Kindergarten and first-grade teachers used the DIBELS Nonsense Word Fluency–Correct Letter Sounds (NWF-CLS) test and the DIBELS Whole Words Recoded Completely and Correctly (NWF-WRC) test. In this test of letter–sound correspondence, students are allowed 1 min to produce as many letter–sounds within nonsense words as they can. Teachers at higher grade levels completed the DIBELS Oral Reading Fluency (ORF) test. In this test of accuracy and fluency with connected text, students read a passage aloud for 1 min; the number of correct words per minute represents the oral reading fluency score. Test–retest reliabilities for elementary students on these subtests range from 0.92–0.97; alternate-form reliability of different reading passages drawn from the same level range from 0.89–0.94 (Deno et al., 2001).

Educators administered three different grade-level tests for each selected student at pretest and posttest. The median score was used in subsequent analyses. Participating educators were trained to fidelity on the DIBELS ORF and NWF by experts from the University of Oregon Center on Teaching and Learning.

2.2.5 | Integrated Literacy Study Group program

The *ILSG* program consisted of 10 online learning modules to be completed in 12 weeks. Module topics are summarized in Table 2. Each topic included routines teachers could use with their students. Drawn from Enhanced Core Reading Instruction (ECRI; Smith et al., 2016) routines, the reading content featured teacher explanations, teacher modeling of the skill or strategy, signaling for individual and group responses, practice for learners, error corrections, and checks for understanding. Behavioral strategies included routines for teaching clear behavioral expectations, organizing the learning environment, responding to unwanted student behavior, and maximizing student engagement. One module was released each week; teachers averaged about 90 min per module to complete the activities. After the introductory module, Modules 2–9 followed a systematic learning sequence: (a) introduction, (b) reflection question, (c) new content, (d) guided practice, (e) application activities, and (f) discussion questions. Each module included two video segments, one for reading and one for behavior. Teachers reflected and discussed the week's content using an online discussion forum. For Modules 2–7, participants recorded themselves practicing a selected routine with peers giving feedback online. During Modules 8–9, teachers prepared a lesson plan for their students instead of a practice video.

During the study, intervention group teachers accessed the *ILSG* program and created personal profiles. Each week, they used the discussion forums to communicate with other team members. At the end of the program, teachers completed posttest assessments, which for *ILSG* participants included the original measures as well as user satisfaction questions. Teachers received USD $500 stipends at the end of the study to compensate for their time and effort.

TABLE 2 *Integrated Literacy Study Group* modules, reading topics, and behavior topics

Module	Reading topic	Behavior topic
1	Introduction to *ILSG*	Introduction to *ILSG*
2	Explicit and systematic instruction	Supporting student engagement
3	Phonemic awareness	Welcoming routines
4	Sound spelling and continuous blending routines	Optimistic closure
5	Advanced sound spelling and blending	Engagement practices
6	Word reading routines	Responding to power-seeking students
7	Decodable text routines	Responding to avoidance-seeking students: Part 1
8	Vocabulary instruction	Responding to avoidance-seeking students: Part 2
9	Text routines	Responding to attention-seeking students
10	Setting students up for success	Review of SEL kernels

Abbreviations: ILSG, Integrated Literacy Study Group; SEL, social and emotional learning.

2.3 | Analyses

Multilevel general linear modeling was used to compare *ILSG* and control group teachers, as well as students of teachers in the two groups. These models were specified to account for the dependence of students nested within educators; due to the recruitment strategy utilizing broadcast methods in every elementary school across five states, nesting of teachers within schools was unnecessary. Analyses were conducted for each outcome to evaluate the effect of condition, controlling for pretest scores on the measure. Distributions of all variables used in the analyses met the normality, linearity, and homoscedasticity assumptions of the tests performed; thus, no transformations were required. IBM SPSS for Windows (v. 19.0) software (IBM Corp., 2010) was used for all analyses.

Effect sizes were estimated for all outcomes: ω^2 was used for teacher outcomes (values of 0.01, 0.06, and 0.14 were considered small, medium, and large effects, respectively; Field, 2013), and Hedges's g was used for student outcomes (values of 0.20, 0.50, and 0.80 were considered small, medium, and large effects, respectively; Hedges & Hedberg, 2013). Based on recent efforts to express intervention effects, researchers have indicated that effect sizes of about 0.20 are of interest when they are based on primary-level interventions (Hedges & Hedberg, 2013) and when the research design uses a comparison group and randomization (Cohen, 1992). Our a priori power analyses indicated that the sample size in this study would provide 80% power to detect small to medium intervention effects ($\omega^2 > 0.01$ for teachers and $g > 0.20$ for students). To adjust for an inflated Type I error rate with multiple comparisons, Benjamini–Hochberg-corrected p values (B–H p) were generated (Benjamini & Hochberg, 2000).

3 | RESULTS

Table 3 presents results addressing the three research questions.

For the first research question—*What was the impact of ILSG on teacher self-efficacy, and on teacher knowledge of evidence-based reading and behavioral supports for students with or at risk for EBD?*—directional, but statistically nonsignificant improvements were found in teacher knowledge from pretest to posttest. The magnitude of the effect was small. Results revealed significant improvements on all self-efficacy measures as measured by the TSES (B–H $p = .007$), the TRSES (B–H $p = .021$), and the TBSES (B–H $p = .007$). Also, there were statistically significant

TABLE 3 Descriptive statistics and treatment effects on teacher outcomes (N = 74) and teacher-reported student outcomes (N = 148)

Measure/condition	Pretest *M (SD)*	Posttest *M (SD)*	*F*	*p*	B–H *p*	ω^2
Teacher outcomes						
Self-efficacy total (TSES)			10.54	.002	.007	0.114
Intervention	7.32 (0.86)	7.86 (0.72)				
Control	7.23 (1.02)	7.22 (1.11)				
Engagement (TSES)			6.60	.012	.021	0.070
Intervention	7.15 (0.98)	7.69 (0.87)				
Control	6.88 (1.31)	6.95 (1.29)				
Instruction (TSES)			9.89	.002	.007	0.107
Intervention	7.19 (1.09)	7.85 (0.76)				
Control	7.44 (1.05)	7.39 (1.19)				
Management (TSES)			10.07	.002	.007	0.109
Intervention	7.63 (0.89)	8.05 (0.79)				
Control	7.38 (1.06)	7.31 (1.13)				
Reading Self-Efficacy (TRSES)			6.51	.013	.021	0.069
Intervention	3.90 (0.79)	4.28 (0.41)				
Control	4.11 (0.63)	4.02 (0.74)				
Behavior self-efficacy (TBSES)			13.15	.001	.007	0.141
Intervention	3.86 (0.67)	4.21 (0.41)				
Control	3.89 (0.69)	3.73 (0.75)				
Knowledge			3.06	.085	.123	0.027
Intervention	18.39 (3.26)	19.90 (3.52)				
Control	18.09 (3.75)	18.69 (3.92)				
CBAM			9.26	.003	.008	0.100
Intervention	112.61 (33.52)	112.71 (33.08)				
Control	104.88 (42.29)	81.09 (54.28)				
	Pretest *M (SD)*	**Posttest *M (SD)***	***t***	***p***	**B–H *p***	**Hedges's *g***
Student outcomes						
ACES			2.59	.011	.021	0.421
Intervention	2.08 (0.54)	2.38 (0.56)				
Control	2.02 (0.48)	2.13 (0.55)				
DIBELS NWF-CLS			1.54	.14	.175	0.561
Intervention	33.9 (37.1)	55.4 (42.9)				
Control	40.0 (34.8)	51.8 (34.1)				
DIBELS NWF-WRC			0.61	.55	.581	0.270
Intervention	3.31 (5.39)	8.88 (7.54)				

(Continues)

TABLE 3 (Continued)

	Pretest *M (SD)*	Posttest *M (SD)*	*t*	*p*	B–H *p*	Hedges's *g*
Control	8.44 (12.2)	12.00 (13.7)				
DIBELS ORF			0.90	.37	.408	0.282
Intervention	62.80 (47.8)	79.7 (46.8)				
Control	75.4 (56.4)	87.5 (50.3)				

Abbreviations: ACES, Academic Competence Evaluation Scales; CBAM, Concerns-Based Adoption Model; DIBELS, Dynamic Indicators of Basic Early Literacy Skills; NWF, Nonsense Word Fluency; ORF, Oral Reading Fluency; TSES, Teacher Sense of Efficacy Scale.

changes on all domains of teacher self-efficacy related to engagement (B–H $p = .021$), instruction (B–H $p = .007$), and management (B–H $p = .007$) based on the TSES. The magnitudes of the effects of *ILSG* on general teacher self-efficacy ($\omega^2 = 0.114$), reading self-efficacy ($\omega^2 = 0.069$), and behavioral self-efficacy ($\omega^2 = 0.141$) were large, as were the TSES subscales for engagement ($\omega^2 = 0.070$), instruction ($\omega^2 = 0.107$), and management ($\omega^2 = 0.109$).

For the second research—*To what extent did teachers find the ILSG program satisfactory and usable?*—there were statistically significant improvements in teachers' levels of use of the *ILSG* program, as measured by the CBAM ($F_{(1,73)} = 9.26$, B–H $p = .008$, $\omega^2 = 0.100$). Also, teachers were very positive about the course design and content (mean rating = 4.45 [*SD* = 0.57] on a 5-point scale) and about how well *ILSG* met their needs (mean rating = 4.16 [*SD* = 0.74]).

For the third research question—*What was the impact of ILSG on reading skills and engagement of students with or at risk for EBD*—we evaluated teacher-reported student outcomes using multilevel regression, accounting for dependence among students clustered under teacher. Controlling for pretest, posttest ACES engagement scores for *ILSG* students were significantly higher than for control students ($t(70) = 2.59$, B–H $p = .021$). *ILSG* students improved by an average of 0.30 points (from 2.08 to 2.38) on the ACES engagement scale while controls improved by 0.12 points (from about 2.02 to 2.13) ($g = 0.421$).

Students of teachers in the *ILSG* condition showed a directional, but nonsignificant improvement on reading scores compared with controls. On the NWF-CLS (15 control students and 16 *ILSG* students), the increase for *ILSG* students was 21.5 (*SD* = 20.8) compared with 11.8 (*SD* = 11.1) for controls (B–H $p = .175$; $g = 0.561$). On the NWF-WRC, the increase was 5.56 (*SD* = 5.61) for *ILSG* students compared with 3.80 (*SD* = 7.02) for controls (B–H $p = .581$; $g = 0.270$). For the ORF (71 control students and 51 *ILSG* students), the average improvement for *ILSG* students was 18.7 (*SD* = 22.6) compared with 12.0 (*SD* = 24.2) for controls (B–H $p = .408$; $g = 0.282$).

4 | DISCUSSION

This study provides initial evidence of the effectiveness of *ILSG* on desired teacher and student outcomes. The program was designed to give teachers a digitally delivered professional learning program that combines behavior support with high-quality reading instruction to enhance academic outcomes for their students with or at risk for EBD. Results demonstrate significant intervention effects on teacher knowledge, teacher self-efficacy, and student academic competence and engagement. The new results are consistent with prior findings establishing the effectiveness of high-quality teacher professional development (Desimone, 2009; Joyce & Showers, 2002) as a strategy for delivering SEL supports (Kern, 2015; Al Otaiba & Fuchs, 2002) and appropriate reading instruction (Benner et al., 2010; Nelson et al., 2005) for students with or at risk for EBD. This study also extends previous work demonstrating the feasibility and social validity of *ILSG* (Benner et al., 2022).

4.1 | Impact of *ILSG* on teacher self-efficacy

The *ILSG* program yielded statistically and educationally significant gains on three measures of teacher self-efficacy, as well as on subscales of teacher engagement and instruction. Teachers gained confidence in their ability to provide evidence-based SEL and reading strategies to their elementary students with or at risk for EBD. This is an important finding, as teachers with high levels of self-efficacy generally experience less difficulty in delivering classroom instruction and managing student behavior. Self-efficacy is related to increased student achievement and behavior in the classroom (Tschannen-Moran & Woolfolk Hoy, 2001)

4.2 | Impact of *ILSG* on teacher knowledge

Teachers are largely unprepared to meet the needs of students with or at risk for EBD and receive limited in-service professional learning to serve this population. This study found that the digitally delivered *ILSG* professional learning approach produced directional, but statistically nonsignificant improvement in teacher knowledge of evidence-based SEL and reading strategies for elementary students with or at risk for EBD. More research is needed to establish whether *ILSG* is an effective way for educators to gain this knowledge.

4.3 | Impact of *ILSG* on teacher practice

User satisfaction results from *ILSG* teachers were generally positive. Participating teachers found *ILSG* to be relevant, useful, and practical. Intervention participants gave high ratings to the *ILSG* course design and its content, and indicated it met their needs. This is not surprising, as *ILSG* was iteratively designed using evidence-based components of professional learning that impact instruction and student achievement (Desimone, 2009). These include active learning, a personalized component contextualized for educator practice (Garrett et al., 2019), and ad hoc feedback and coaching (Kraft et al., 2018).

4.4 | Impact of ILSG on reading skills and engagement of students with or at risk for EBD

Students with or at risk for EBD who learned from *ILSG* teachers improved academic competence and engagement relative to controls. Although improvements on reading scores were not statistically significant, the effect sizes were of educational importance and demonstrate the potential of the *ILSG* program. Research on the impacts of online training for teachers of students with or at risk for EBD is limited; as such, this study provides useful information about the impact of such training on student reading outcomes. Student engagement—an academic enabler—improved significantly more for students of *ILSG* teachers (from 2.08 to 2.38) than for controls (from 2.02 to 2.13). This result is not only statistically significant but also is of practical importance, as reflected in the Hedges's *g* effect size (>0.20) as well as the score value. Scores on this measure may be interpreted as follows: 1–2 = acquisition problems, 3 = performance problems, and 4–5 = strengths (DiPerna & Elliott, 2002). All students on average began with a score of about 2.0 at pretest, indicating problems in acquiring the skill, but only intervention students made significant strides toward performing the skill. With continued intervention, it is possible that engagement could become a strength, at least for some students.

4.5 | Limitations and future directions

The results reported here should be interpreted with caution because of several limitations of this study. The sample size was small and geographically limited, which inhibits generalizability. Future researchers should use larger samples drawn from wider geographic areas. Given the ongoing academic and social–emotional needs of students with or at risk for EBD, future research should adapt and evaluate the *ILSG* program for secondary school teachers. This study employed researcher-developed measures of teacher knowledge, self-efficacy, and practice; future studies should use standardized and validated measures when available and possible.

4.6 | Conclusions

Teachers are generally ill-equipped to meet the literacy needs of students with or at risk for EBD. As a result, there is a reading achievement gap for students with these students that widens over time. The results of this RCT indicate that the *ILSG* program is a socially valid, practical, and effective professional learning program for teachers to better serve the intensive literacy and behavioral needs of their students with or at risk for EBD.

ACKNOWLEDGEMENT

This study was supported by the U. S. Department of Education Institute of Education Sciences, grant R324A180220. The opinions expressed are those of the authors and do not represent the views of the institute or the U. S. Department of Education.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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How to cite this article: Benner, G. J., Filderman, M. J., Barnard-Brak, L., Pennefather, J., Smith, J. L. M., & Strycker, L. A. (2022). Evidence of efficacy of the *Integrated Literacy Study Group* professional learning program to enhance reading instruction for students with emotional and behavioral disorders. *Psychology in the Schools*, 1–17. https://doi.org/10.1002/pits.22773