Social and Emotional Learning Study Groups+

Development of social and emotional skills is foundational to student success in both academics and life (Melnick & Martinez, 2019). Improving youth social and emotional learning (SEL) outcomes for all students requires educators equipped with knowledge and skills to deliver differentiated SEL instruction (Durlak et al., 2011; Nelson et al., 2008; Raver et al., 2009). However, teacher preparation programs in colleges do not emphasize SEL instruction in required courses (Kremenitzer, 2005; Lopes et al., 2012; Schonert-Reichl, Kitil, Hanson-Peterson, 2017). Educators receive an average of eight hours of training on effective social and emotional learning strategies and even less training on how to differentiate to youth with significant behavior concerns (Greenburg, McKee, & Walsh, 2014). As a result, educators are ill-equipped and feel unprepared to provide explicit, differentiated SEL instruction, particularly for students with and at risk for emotional and behavioral disorders (EBD) (Slate et al., 2019; Shapiro et al., 1999; Wong, Kauffman, and Lloyd, 1991). While all students can benefit from improved social and emotional skills, the social and emotional difficulties students with EBD face play a significant role in their poor academic and long-term outcomes (e.g., Nelson et al., 2004; Nelson, Benner, & Mooney, 2008; Wagner et al., 2005). Eighty percent of students with EBD are served in general education classrooms (National Center for Education Statistics, 2016). These educators need a solution that meets all their students' needs.

This project will give elementary educators the ability to deliver appropriate SEL instruction to *all* early elementary learners (grades K-3) including those with or at risk for EBD. The University of Alabama (UA) in partnership with xSEL Labs, Oregon Research Institute (ORI), Trifoia, Research Press, and school partners (see Letters of Support: Appendix A),

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propose to develop and evaluate the *Social and Emotional Learning Study Groups* (SELSG+) which includes:

1. Evidence-based Tier 1 SEL instruction for all students in grades K-3 that is feasible, usable, and acceptable to teachers and students.

2. Data-based SEL assessments to identify students needing Tier 2 intervention and progress monitoring to measure improvement.

3. Evidence-based Tier 2 instruction delivered in small groups and individually that is tailored to students' needs and performance.

4. Digitally-delivered professional learning augmented by in-person teacher study groups (TSGs) and personalized coaching.

The project goals are (1) to develop a digitally-delivered Tier 1 and Tier 2 SEL curriculum with data-based differentiation for K-3 students, (2) to craft digital and in-person professional learning to train teachers and provide ongoing support as they implement the program, (3) to establish What Works Clearinghouse moderate evidence for SELSG+ through a randomized wait-list control study, and (4) to disseminate the results in peer-reviewed publications, reports, and through popular and social media channels.

PROJECT DESIGN

The majority of SEL programs in elementary schools are universal. These Tier 1 interventions fall short in providing in-depth, differentiated support that students with various social-emotional needs and challenging behavioral issues require. SELSG+ seeks to remedy this problem by providing teachers training in evidence-based core SEL instruction for all students, support to strategically use assessment to identify students for Tier 2 intervention, and flexible, targeted, small group and individual instruction for those needing additional support including

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those with or at risk for EBD. The authors hypothesize that this unique tiered approach to SEL student instruction and professional development will result in multiple positive outcomes for both teachers and their students. It will develop educator effectiveness and foster knowledge and promote the development of skills that prepare students to be informed, thoughtful, and productive individuals and citizens. The project also aims to improve student academic engagement and performance through acquisition of specific social and emotional skills.

The SEL content in the SELSG+ curriculum aligns with the sub-criteria for competitive preference priority 2 for this grant which are to develop (1) positive personal relationships with others; (2) determination, perseverance, and the ability to overcome obstacles; (3) self-esteem through perseverance and earned success; (4) problem-solving skills; and (5) self-regulation in order to work toward long-term goals. The content also aligns with the five CASEL SEL Core Competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (CASEL, 2020).

All program elements will be delivered via a platform-independent, secure web site built to support media-rich, interactive content for students and educators. Teachers will individually access the professional learning resources on the web site where they will view content, respond to reflection questions, and access the TSG protocols. They will meet in person with their colleagues to discuss the professional learning content, practice teaching routines, and work together to review assessment materials and develop appropriate Tier 2 groupings and lesson plans for students requiring additional support. Teachers will share the Tier 1 and Tier 2 curriculum materials with their students via an Internet-enabled computer and a LCD projector or computer monitor. Students will not individually access the course. The teachers will print

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PDFs of handouts and other materials from the course web site to provide to their students. The web site will collect analytics about teacher use of all program elements.

Evidence-based Tier 1 SEL Instruction for All Students in Grades K-3

This project will develop and assess the feasibility, acceptability, user satisfaction, and usability for a digitally delivered version of the universal *We Have Skills! (WHS)* curriculum. Currently, *WHS* is a print and video-based program designed to teach SEL skills to students in grades K-3. *WHS* is identified as one of 25 evidence-based SEL programs by Harvard University's Ecological Approaches to Social Emotional Learning Laboratory (Jones et al., 2017). *WHS* consists of two core components (1) an eight-week video-based video curriculum with classroom materials and (2) a 40-page printed Teacher Curriculum Guide. The eight-week *WHS* curriculum includes eight 30-minute classroom lessons, practice exercises, and take-home materials. The first lesson defines classroom behavioral skills and explains their importance. The remaining lessons teach seven core behavioral skills derived from research (Hersh & Walker, 1983; Walker & Rankin, 1980; Walker & Rankin, 1983): 1) Listen, 2) Ask for help, 3) Follow directions, 4) Do the best you can, 5) Follow the rules, 6) Work out strong feelings, and 7) Get along. Classroom instruction includes daily practice through problem-solving discussions, role plays, and games and review of skills during activities like classroom instruction, independent work, and transitions. Educators provide students with independent activities that reinforce the skills and lessons learned in class and send home parent materials that support learning goals.

WHS was evaluated in a randomized control trial with early elementary (grades K-3) teachers and students in four demographically diverse districts in three states with 70 teachers who had varying levels of experience (Marquez et al., 2014). This study met What Works Clearinghouse (WWC) standards without reservations. Intervention group teachers' self-efficacy

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and their students' behavior and demonstration of key social skills as rated by teachers were statistically significantly better compared to teachers and students in a control group (Marquez et al., 2014). Additional findings include high social validity (i.e., acceptability and satisfaction) and usability ratings among teachers and a high student acceptance rating for the *WHS* materials (Marquez et al., 2014). The short-duration lessons and eight-week delivery appeal to early educators with limited time to implement more complex, lengthy SEL programs.

The SELSG+ project will adapt the printed lesson plans and video materials to a digital format, in order to increase educator accessibility. The intervention content will not be modified. Teachers will follow the digital Teacher Curriculum Guide to deliver the *WHS* program to their students. They will share the skill steps, video modeling examples, and picture cards for skills identification with their class via the SELSG+ web site. They will print out skill tickets to give to students alongside descriptive praise, skill tally sheets for students to notice and record their own practice, and other handouts including parent materials.

Data-based SEL Assessments and Progress Monitoring

SELSG+ will include student assessment of social and emotional skills to facilitate assignment to Tier 2 intervention. The program also will include teacher report progress monitoring for all students with more frequent monitoring for those receiving targeted small group or individual instruction. McKown et al. (2016) asserts that "rigorous assessment of social-emotional comprehension is critical so that clinicians and educators can fully evaluate children's strengths and needs in ways that inform practice" (p. 323). Additionally, this data-based differentiation approach is supported by strong evidence from a WWC IES practice guide, *Reducing Behavior Problems in the Elementary Classroom* (Epstein et al., 2008).

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The project will use SELweb EE, a web-based tool to assess social-emotional comprehension K-3 students (xSEL Labs, 2020) for the initial assessment. SELweb is a child friendly, digitally-delivered 25-minute assessment which is designed for independent student use without staff assistance on a computer or tablet. Based on a previous model of social-emotional comprehension (Lipton & Nowicki, 2009), SELweb consists of four dimensions (McKown et al., 2016b; see Table 1). Across two studies with a large ethnically and socioeconomically diverse sample, the measure reports high score reliabilities (ranging from .79 to .88), a theoretically coherent four-factor model, and convergent and discriminant validity (McKown et al., 2016c; McKown, 2019).

Table 1 SELweb Four Dimensions

Dimension	Description
Social awareness	Understanding of others' emotions
Social meaning	Interpreting others' mental states
Social reasoning	Reasoning about social problems
Self-control	Delaying gratification and controlling emotions toward goal attainment

Students deficient in particular skills will be grouped for Tier 2 intervention based upon the results from SELWeb and additional data about individual students from direct observation, skill checklists, and other sources. During the professional learning activities, they will learn how to effectively select and apply differentiated evidence-based SEL skills aligned to the five CASEL Core Competencies. SELSG+ modules focusing on Tier 2 assessment and implementation will inform teachers how to administer SELWeb, how to interpret results using SELweb data reports, and how to combine these results with additional data. The SELSG+ platform will enable grouping through visualization of data and identification of students with similar patterns of deficiencies. Teachers will be encouraged to view this information in grade level teams to efficiently and effectively sort students for small group and individual instruction.

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In addition, the Elementary Social Behavior Assessment (ESBA), a teacher-report of student social and emotional skills, will be used to conduct progress monitoring (Pennefather & Smolkowski, 2015). The ESBA was developed specifically to assess the skills teachers report as important in students (Walker et al., 2015). It allows teachers to screen their entire class and monitor progress of individual (targeted) students on their use of prosocial behaviors in the classroom. With the ESBA, teachers rate students' engagement in positive behaviors on 12 items: (a) listens to and respects the teacher, (b) follows teacher directions, (c) works with effort, (d) does seatwork as directed, (e) asks for help appropriately, (f) follows classroom rules, (g) avoids breaking rules even when encouraged by a peer, (h) behaves appropriately outside the classroom, (i) works out strong feelings appropriately, (j) can have "normal" conversation without becoming hostile, (k) gets along with peers, and (l) resolves peer conflicts adequately without teacher assistance. The items were derived from research by Walker and colleagues (Walker & Rankin, 1980, 1983). The ESBA has demonstrated good internal reliability (alpha > .94) and criterion validity through high correlations with other normed and validated measure of student behavior: the Walker-McConnell Scale – Elementary Version (Walker 1995) (r = 83, p < .001) and the Brief Behavior Scale (Gresham, 2010) (r = .77, p < .001).

The project will use the SimpleScreener, a digital assessment tool that includes a user-friendly version of the ESBA with data visualization. The data also can be exported to other systems like SELSG+. Educators can establish baseline data for a class and quickly assess response to intervention and measure improvement for students receiving Tier 2 instruction.

Evidence-based Tier 2 Instruction for Identified Students

This project will develop and assess the feasibility, acceptability, user satisfaction, and usability for a digitally delivered Tier 2 intervention. Using SELSG+, teachers will select

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evidence-based SEL skills lessons to use with small groups and individual students to address

social and emotional skills deficits. The social skills training program that will be the basis for

the Tier 2 intervention in SELSG+ is *Skillstreaming the Elementary Child* (McGinnis &

Goldstein, 1997, 2003; *Skillstreaming*). *Skillstreaming* is a widely-used Tier 2 social skills

training program that targets: 1) classroom survival skills, 2) friendship-making skills, 3) skills

for dealing with feelings, 4) skill alternatives to aggression, and 5) skills for dealing with stress.

Students learn these skills through evidence-based learning processes including modeling, role

playing, performance feedback, and generalization.

The research base for *Skillstreaming* is robust and longstanding. Moreover,

Skillstreaming incorporates best practices for implementation of social skills training for students

with EBD. Over 70 studies have been conducted on the program to date (e.g., Bryant & Fox,

1995; Choi & Heckenlaible-Gotto, 1998; Cutierrez, & Hurtado, 1984; Goldstein et al., 1971;

Goldstein et al., 1973; Jennings & Davis, 1977; Lopata et al., 2006; Lopata et al., 2008;

Sarmento et al., 2008). For example, Sheridan and colleagues (2011) conducted a quasi-

experimental investigation of the *Skillstreaming* program on a sample of 647 kindergarten

through third grade children in Canada (325 boys, 322 girls). These researchers found

statistically significant improvements on all social and emotional learning skills as well as

ratings of overall prosociality obtained from both classroom teachers and mental health staff.

Moderate and large effect size estimates were found on student behavioral health based on

teachers' and mental health professionals' ratings.

It addition to the strong research base for *Skillstreaming*, there are several other reasons

for selecting it as the Tier 2 intervention within SELSG+. First, it is flexible and is designed to

be differentiated and individualized. Only skills (out of 60 available) where students are deficient

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need be taught and speed of progress through the curriculum can be adjusted to meet individual needs. The program has been flexibly adapted for a range of students with and without disabilities, including those who may be at risk for emotional and behavioral disorders (e.g., Sasso, Mellowy, & Kavale, 1990). Second, it is efficacious for K-3 youth with or at risk of EBD (Zigler, Taussig, & Black, 1992; McMahon & Wells, 1998). Third, *Skillstreaming* is socially valid and easily implemented. It has been used successfully by a range of professionals including mental health providers, teachers, and nurses (Farmer-Dougan, Viechtbauer, & French, 1999). Fourth, it is designed for collaboration. The instructional format encourages family and teacher engagement (McGinnis & Goldstein, 1997). Finally, the similarity in collaboration, learning procedures used including modeling, role-playing, and feedback, and the alignment of skills alignment between *WHS* and *Skillstreaming,* where the latter goes into more depth in each area makes *Skillstreaming* a good choice to be the Tier 2 intervention for the proposed project.

After teachers have identified students and sorted them into small groups, they will use SELSG+ to select the skills they will teach to each group or individual. SELSG+ will guide teachers through the process, recommending skills based upon results from SELWeb and other data about the students in a given group. The program will place the skills within the five CASEL Core Competencies in a logical order for instruction. However, teachers may use the drag-and-drop features to re-arrange the order to better meet the context and student instructional needs. They also may add and remove skills as needed. Teachers will use SELSG+ to guide their instruction with a small group, to display digital instructional materials like skill outlines and modeling videos, and to print student skill cards and resources for parents.

Digitally-delivered Professional Learning with in-person TSGs and Personalized Coaching

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A meta-analysis of SEL explicit and systematic programs demonstrated that the quality of implementation impacts program outcomes (Durlak et al., 2011), with effective implementation leading to better student outcomes (Durlak & DuPre, 2008). Thus, SELSG+ will follow evidence-based best practices to ensure high-quality implementation. The professional learning curriculum is structured to be sequential, active, focused, and explicit with teachers learning and practicing new skills as they proceed through the modules. They will practice with fellow teachers and work towards mastery prior implementing the Tier 1 and Tier 2 curriculum. SELSG+ also will include other elements to create conditions important for effective implementation including devoting enough time to implement the intervention; encouraging its use outside the classroom; supporting everyday use of social skills; providing sufficient training and support for educators; creating buy-in from educators; and using the aforementioned data to inform decision-making (Jones et al., 2018).

Educators will individually access SELSG+ via a secure web site that also includes the student curriculum materials, teacher curriculum guides, protocols for the teacher study groups, and additional resources. Digitally-delivered professional learning has emerged as a viable alternative to traditional professional learning activities, with evidence that web-based learning has produced comparable or better results than face-to-face training (Fishman et al., 2013: Lauer, Stoutemyer, Van Buhler, 2005; U.S. Department of Education, 2009). Specifically, the mean effect size in studies comparing blended (i.e., both face-to-face and online) with face-to-face instruction was +0.35. This effect size was larger than that for studies comparing purely online and purely face-to-face conditions, which had an average effect size of +0.05. In fact, the learning outcomes for students in purely online conditions were statistically equivalent to those for students in purely face-to-face conditions. Other benefits that make web-based delivery of

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professional learning appealing include flexibility to participate according to the educators'

schedule; the ability to tailor the pace of professional learning to fit individual or group needs

(Bartley & Golek, 2004); increased access to resources not locally available; extended

opportunities for learning as opposed to one-to-two day workshop events (Dede, 2006; Lauer et

al., 2005; Treacy, Kleiman, & Peterson, 2002); and greater willingness to participate in this form

of professional learning in the future (Russell, Kleiman,& Venable, 2009).

The SELSG+ professional learning course will guide educators through twelve modules

which will help them learn, reflect, and implement the featured SEL content and conduct

assessments and progress monitoring (see Table 2). Two studies noted that online collaborative

teacher professional learning groups are better than in-person groups for engaging participants in

reflective practice (Hawkes & Good, 2000; Hawkes & Romiszowski, 2001), hence this will be

part of the online experience.

Table 2 Educator learning objectives

Topic	Educator Learning Objectives
Module 1: Intro to social and emotional learning instruction	• Explain the importance of SEL for elementary youth. • Explain the importance of SEL in my life (professional and personal). • Identify a personal reason for adjusting my teaching routines. • Articulate state and district SEL learning standards and benchmarks.
Module 2: Multi-tiered prevention and how effectively implement in our school	• Explain multi-tiered prevention. • Describe implementation science. • Compare evidence-based SEL interventions. • Describe an effective TSG.
Module 3: Understanding social and emotional strengths and needs	• Describe my social and emotional strengths to my students. • Practice regularly checking my emotions and recognize them. • Apply social perspective taking in my personal and professional life. • Model self-control to my students.

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	• Model social problem solving to my students.
Module 4: Implementing We Have Skills!	• Describe the skills included in *WHS*. • Deliver the *WHS* curriculum to my students.
Module 5: Data-based differentiation through SEL assessment	• Explain data-based differentiation. • Describe the benefits of differentiation. • Show how social and emotional strengths and needs related to specific skills to be taught.
Module 6: Teaching *Skillstreaming*	• Show able to model skills. • Demonstrate able to initiate and sustain role-playing. • Deliver appropriate performance feedback. • Provide examples how to teach generalization.
Module 7: Implementing *Skillstreaming*	• Demonstrate good process-skills. • Develop sample teaching agenda for a lesson. • Explain how to manage problem behaviors in small groups. • Discuss how to reinforce skill use.
Module 8: Skills for self-awareness	• Demonstrate knowledge of relevant skills. • Apply skills in sample lesson.
Module 9: Skills for self-management	• Demonstrate knowledge of relevant skills. • Apply skills in sample lesson.
Module 10: Skills for social awareness	• Demonstrate knowledge of relevant skills. • Apply skills in sample lesson.
Module 11: Relationship skills	• Demonstrate knowledge of relevant skills. • Apply skills in sample lesson.
Module 12: Skills for responsible decision-making	• Demonstrate knowledge of relevant skills. • Apply skills in sample lesson.

SELSG+ will have teacher study groups which are an evidence-based professional

development approach for building teacher capacity to implement and sustain effective

classroom practices (Desimone, 2009; Garet et al, 2001; Gersten et al., 2010; Jayanthi et al.,

2018; Wayne, et al., 2008). Participants will collaborate with existing grade level teams of

teachers, or in smaller schools, multi-grade teams to discuss the content, practice

implementation, review assessment data, group students for Tier 2 intervention, and develop

lesson plans. A majority of schools currently provide grade level teams with common weekly

planning time to participate in professional learning communities, and the collaborative aspect of

the TSGs will fit seamlessly into this existing framework to provide maximum efficiency and

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benefit toward both teachers' professional learning and implementation with students. Through their TSGs, teachers in SELSG+ will work collaboratively online to reflect on their current practices. Educators also will meet in person to provide feedback on teaching practice including modeling skills, initiating and sustaining role-playing activities, and providing appropriate feedback to students. They will discuss assessment results, group students, and plan implementation for particular Tier 2 small groups too. Given that there is empirical support for peer coaching within groups of teachers with different strengths and weaknesses (Papay et al., 2016), they also may provide coaching to each other.

Additionally, teachers in SELSG+ may request personalized coaching. Virtual coaches will provide individualized feedback and additional opportunities to practice skills learned, both of which have been demonstrated to improve implementation, instruction and student outcomes (Diamond & Powell, 2011; Kraft, Blazer, & Hogan, 2018; Joyce & Showers, 2002). Teachers in SELSG+ may request coaching directly through the web-interface. Coaching will be delivered by PI Benner and trained instructors through written messages and phone and video calls.

SELSG+ Implementation Timeline

Schools that implement SELSG+ will do so over the course of the academic year. Teachers will form study groups prior to the start of fall semester. They will spend two weeks on each of twelve modules over the course of the first and second semester. After ten weeks of professional learning, they will undertake the first progress monitoring assessments using SELWeb and the ESBA for all their students. Then, they will implement the universal *WHS* curriculum in their classrooms. They will complete the eight-week implementation during fall semester. They will reassess their students using SELWeb and the ESBA to measure progress. At the start of the second semester, teachers will group students needing Tier 2 intervention based

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upon the results from SELWeb, ESBA, and additional teacher report and observational data. They will develop small group lesson plans and begin delivery of the material by the third week of the second semester. Small group lessons will last ten weeks to allow for final assessments.

Design Research and Development of SELSG+

We will use a user-centered, iterative process to design, build, and assess the digitally-delivered program including all student curricula and teacher professional learning resources. This process will ensure that the program meets the needs of the targeted populations, both K-3 students who will receive the curriculum and educators implementing the program. There will be three iterations of the intervention during Years 1 and 2 with a final iteration taking place during Year 3 prior to the evaluation study (see Timelines in Management section). Sixty-six general education teachers who work with elementary students with or at risk for EBD will participate in the design and development of SELSG+. We will recruit from Montgomery County Schools (QOZ Tracts 01101000300, 01101006000, 01101000100, 01101000500, 01101000600, 01101000200, 01101001100, 01101001000, 01101005902, 01101002100, 01101002900, 01101005603), Tuscaloosa City Schools (QOZ Tracts 01007010002, 01125010404, 01125010407, 01125011402, 01125011600, 01125011800) and Jasper City Schools (QOZ Tract 01127020400) that are located in Qualified Opportunity Zones. Investment in these designated high-need areas responds to the SEED program's third competitive priority. In addition, select Qualified Opportunity Zones in rural areas align with the goals of the UA's Rural Health Commitment, facilitated by grant partner Alabama Life Research Institute, to improve health outcomes for citizens and communities located in rural areas of Alabama. We will recruit more female teachers than male because 89% of elementary school teachers are women (National Center for Education Statistics, 2020). In addition, every effort will be made to recruit

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participants such that the racial/ethnic composition of this sample reflects the proportional national representation based on the 2010 U.S. census. Project staff will contact teachers via email and phone for each stage of the design research. Interested teachers will complete an online screening assessment and provide consent via Qualtrics. All design research activities will be approved by the UA IRB.

User Feedback about Low Fidelity Prototype for SELSG+ We will develop a low-fidelity prototype for SELSG+ including 1) introductory professional development resources, Module 1: Intro to social and emotional learning instruction and Module 5: Data-based differentiation through SEL assessment; 2) one of the lessons for the *WHS!* curriculum; 3) one of the lessons for the *Skillstreaming* curriculum, one from each of the five CASEL Core Competencies; and 4) the tools that will help teachers groups students and select skills to instruct specific small groups. This simple sketch of the product can be produced quickly and is suitable to test concepts and general features for a product (Ries, 2011). In this case, we will assess content validity for the student and teacher materials and the design for interactive data-based differentiation and skill selection features. The design team led by the design researcher, PI Trusty, with PIs Benner and McKown participating will refine learning objectives, draft an outline for each module, modify existing assets, and develop requirements for the software features. During this process, PIs Benner and McKown will review and provide feedback on these materials for fidelity and to ensure they meet course objectives and are appropriate for the intended audience. The design researcher will prioritize requirements for the production team, comprised of instructional design, media production, and software development, which will develop the low-fidelity prototype. Instructional design will build the course framework. The

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media production team will develop scripts and video treatments. The software development team will create mock-ups, models of the functionality for the two interactive features.

We will recruit general education elementary-school teachers (n = 36) who work with students with or at risk of EBD to participate in six virtual focus groups led by the design researcher. Three focus groups will include teachers who have used one or more SEL curricula and three will include participants who have not used a SEL curriculum. Focus groups are an effective method for use in the design of interventions (Johnson & Turner, 2003) and help assess design proposals for software including what participants want the system to do and what should be changed in the design (Paetsch, Eberlein, & Maurer, 2003). The number of focus groups to be held normally receives little explanation or evidence (Carlsen & Glenton, 2011). However, recent research indicates that for focus groups with similar characteristics to those proposed that use inductive thematic analysis, three to five is sufficient to achieve 90% saturation (Guest, Namey, & McKenna, 2017). Three groups for each of the subject populations will yield sufficient data to evaluate the look and feel, course content, expectations for key features, and feasibility and to revise the intervention at this stage in the iterative development process. The low-fidelity prototype will be a prompt for questions and discussion. In addition, we will ask about their assessment of feasibility to implement the proposed curriculum in elementary schools and their thoughts about acceptability. We'll conclude the activity with a short online demographics questionnaire that asks about race/ethnicity, age, years' taught, grade taught, et cetera. We'll also ask general questions about the students in their classroom including the number with and at risk for EBD. Participants will be paid $60 for a ninety-minute focus group.

The focus groups will be audiotaped, and participants' responses will be transcribed and analyzed by a qualitative data analyst using ATLAS.ti, software that facilitates identification of

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salient themes. The analyst will use applied thematic analysis, a pragmatic, transparent, systematic approach to inductively identify issues with content validity and the design of key features (Guest, MacQueen, & Namey, 2012). The design researcher and Co-PIs will use the results to prioritize requirements for the production team for the next iteration.

Design, Build, and Assess First Iteration of SELSG+ For the next version of the program, we will iterate the materials created previously, develop the first six professional learning modules, complete the digital version of *WHS¹*, and develop 25 *Skillstreaming* lessons. The design team will plan the development and review all materials as they are created. The instructional design team will ensure that each of Gagné's nine events are included in the professional learning modules (2005). This will ensure we achieve both user engagement and knowledge retention. Recent research has shown that including Gagné's (2005) nine events of instruction in online learning environments improves retention and increases enthusiasm for a course (Gökdemir et al., 2013; Miner et al., 2015; Solanki, 2014). We'll also use the Quality Matters (QM) rubric for evaluating online and hybrid courses to ensure quality standards are met for the entire course. The QM rubric includes eight broad quality categories, each of which has four to five substandards: (1) course overview and introduction, (2) learning objectives (competencies), (3) assessment and measurement, (4) instructional materials, (5) learner interaction and engagement, (6) course technology, (7) learner support, and (8) accessibility. Scores are calculated and courses that fail to meet the minimum standard should be iterated until they achieve the standard.

To assess this iteration of the program, the design researcher will use a think-aloud (TA) protocol with elementary-school teachers in general education classrooms who teach students with or at risk of EBD (*n* = 10). Teachers will remotely access program web site via an Internet-

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enabled computer. Participants will be asked to explore the teacher professional learning resources and the student curriculum materials for Tier 1 and Tier 2 and to say whatever they are thinking during the activity. Because the participant describes the learning experience in real-time including the decisions they make, they provide a level of detail and identify problems not likely to be discovered with research methods like interviews and focus groups (Cotton & Gresty, 2006). The protocol also helps identify problems performing tasks better than a heuristic evaluation by experts (Yen & Bakken, 2009).

For the TA, we will employ a coaching approach described by Olmsted-Hawala et al. (2010) where the interviewer provides more verbal input than with the traditional TA (Ericsson & Simon, 1993) including asking probes and assisting the participant when struggling. This approach will improve the accuracy of tasks performed and elicit richer verbal feedback. Following the principle of discount usability which balances the error discovery rate with number of iterations to follow, we will aim for an 80% discovery rate for problems. While five participants are commonly considered sufficient (Lewis, 1994; Nielsen & Landauer, 1993; Virzi, 1992), recent research indicates nine users for TA is more likely to capture 80% of the errors (Hwang & Salvendy, 2010). During the TA, we will evaluate three areas central to digital learning evaluation: (1) interface usability (*Can the user achieve their goal?*), (2) content validity (*Does the content make sense?*), and (3) educational utility (*Did the user learn?*) (Milton, 2003). After the protocol, we will conduct a short semi-structured interview about feasibility, acceptance, and user satisfaction. Participants will receive $60 for a ninety-minute session.

The design researcher will use LookBack to moderate and capture audio and screen activity from the TA session (https://lookback.io). Additional research team members may observe and take notes during the session. Audio recordings will be transcribed. Transcripts,

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notes, and screen capture videos will be analyzed by the research team using ATLAS.ti using applied thematic analysis. Results will emphasize the perceptions, needs, and concerns about the content and the interactive features. The research team will collectively review the results, summarize the findings, and prioritize items to address in the next iteration.

Design, Build, and Assess Second Iteration SELSG+ As with the previous two phases, the design team will develop the learning objectives, outline the content, and draft assets for the remaining teacher modules and student lessons. The PIs will review and provide feedback about these materials, which the design researcher will use to create final requirements. The instructional design, media production, and software development teams will develop the second iteration which will include all components for SELSG+. As in the previous phases, the instructional design team will ensure that each of Gagné's events are included in the modules and use the QM rubric to evaluate the modules for quality.

General education elementary-school teachers ($n = 20$) who work with elementary students with or at risk for EBD will participate in a remote, moderated scenario-based usability test of the revised program. A greater number of users can increase certainty that problems are found during usability testing (Barnum et al., 2003; Faulkner, 2003), with a recent study showing 20 users can identify 95% of the issues (Faulkner, 2003). The design researcher will present scenarios that lead to tasks such as viewing a video, practicing a skill, completing a reflection post, grouping students, designing a Tier 2 lesson plan, and delivering a Tier 1 and a Tier 2 lesson. Participants will be asked structured questions about each scenario related to interface usability, content validity, and learning utility. The two-hour session will conclude with an online questionnaire with Likert-scale like and open-ended questions about feasibility, acceptability, user satisfaction, and overall usability. We will develop curriculum and feature-

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specific questions. We'll also use the System Usability Scale (SUS) (Brooke, 1996) to assess overall usability with minor wording changes to align the questions with the type of product being assessed (Lewis & Sauro, 2009) and the addition of an adjective rating scale to help communicate the numeric results to those who are less familiar with usability studies (Bangor, Kortum, & Miller, 2009). Across a large number of contexts, populations, and technologies the SUS has shown good internal reliability (.81 - .82) (Bangor et al., 2009; Bangor, Kortum, & Miller, 2008) and correlates significantly with error free usage of the associated technology (r =.22) (Brooke, 1996). Participants will receive $100 for their participation.

Scenario-based usability sessions will be recorded in LookBack, and the audio recordings will be transcribed. Transcripts will be analyzed by the research team using ATLAS.ti using the same methods employed previously for qualitative data. We will use Qualtrics to record responses to the Likert-scale and open-ended follow-up questions and the SUS. We will calculate a composite measure for the SUS and normalize the score to convert it to a percentile rank for ease of communication with team members. Quantitative user satisfaction questions will be analyzed descriptively using SPSS. Data averages will be explored to determine user satisfaction.

Results will be summarized as requirements for revisions to the course to be developed before the evaluation in Year 3. Revisions will be prioritized so that those participants will access first during the project evaluation (e.g., teacher professional learning and student and teacher materials for Tier 1 intervention) are completed first. Revisions to the Tier 2 student materials will be completed later as they will not be needed until the second half of Year 3.

Ongoing Project Purposes, Activities, and Benefits

The proposed project scope during the three-year period of this grant will take SELSG+ through the design research and development phases and the project evaluation. For each of the

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sites that pilot the implementation, a natural next step is to expand the program schoolwide to participants' immediate colleagues. In subsequent years, we would bring this digital innovation to scale regionally and nationwide, in order to promote teachers' accessibility to high quality SEL professional development and Tier 1 and Tier 2 curriculum. Large-scale research studies would be conducted to investigate the innovation's efficacy across various settings, and data would be used to inform programmatic enhancements and later iterations.

SIGNIFICANCE

There is a growing focus on student SEL and mental health in education at state and district levels, with a resulting increase in schools' adoption of SEL standards and instructional programming. However, in a recent issue brief by Pennsylvania State University, McKown and Herman document challenges in maintaining the quality of SEL instruction as policy and programming are brought to scale (2020). SELSG+ believes it can overcome these challenges through its design and delivery.

SELSG+ is built on a firm foundation of research citing positive outcomes for both teachers and students. The theoretical justification for SELSG+ is drawn from two categories: 1) evidence on best practices in SEL instruction, assessment, and intervention, and 2) evidence about professional learning. SELSG+ links evidence-based professional learning practices with changes in educators' knowledge, beliefs, skills, and self-efficacy that will subsequently lead to improved student distal outcomes, including social and emotional competence, behavior, and academic engagement and performance. Research demonstrates a link between SEL competencies and favorable student outcomes in regard to academics, behavior, and physical and mental health (McKown, 2017). Building educator capacity to implement SEL instruction has statistically and educationally significant effects on student outcomes, particularly those with and

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at risk for EBD (Cook et al., 2008; Durlak et al., 2011; Gresham, 2015). SELSG+ has the potential to improve teacher knowledge, instruction, and self-efficacy for elementary educators including those who serve students with and at risk for EBD (Benner et al., in press; Garrett, Citkowicz, Williams, 2018).

SEL Instruction, Assessment, and Intervention

Students Responsive to SEL and Social Skills Training Growing evidence suggests students are responsive to effective SEL instruction demonstrating 1) increased academic motivation and performance (Bavarian et al., 2013; Brackett et al., 2012; Durlak et al., 2011; Malecki & Elliot, 2002; McClelland et al., 2000) 2) increased social and emotional skills and attitudes (Brackett et al., 2012; Durlak et al., 2011), and 3) improved behavior (Portnow et al., 2015).

Relevant to the approach used in SELSG+, social skills training (SST) for students with and without EBD has been effective. SST is not a specific curriculum, but rather a collection of practices that use a behavioral approach for teaching children social and emotional learning competencies. Researchers of a What Works Clearinghouse intervention report on social skill training identified three studies that met WWC evidence standards without reservations (U.S. Department of Education, 2013). Together, they included 135 children with disabilities in early education settings in the United States. All three of those studies found statistically significant positive effects on social-emotional development and behavior (Ferentino, 1991; Guglielmo & Tryon, 2001; Leblanc & Matson, 1995).

Additionally, multiple reviews and meta-analyses show positive outcomes (Cook et al., 2008, Gresham, 2015). A recent comprehensive meta-analysis of SST and cognitive behavioral therapy (CBT) found SST to be effective executed alone or with another form of treatment for

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students with EBD, particularly those with EBD of an internalizing nature (Scaini et al., 2016).

An earlier review of the literature of 35 quantitative studies investigating the impact of SST on

students with EBD found an mean average 8 percentile rank increase (mean pooled effect size of

.199) on social and emotional outcomes of students with EBD (Quinn et al., 1999).

Additionally, teaching social and emotional skills to support positive behavior and

classroom environment is supported by WWC strong evidence based on five randomized

controlled trials (Conduct Problems Prevention Research Group, 1999; Daunic et al., 2006; Frey

et al., 2005; Grossman et al., 1997; Walker et al., 1998) and three single-subject studies (Beard

and Sugai, 2004; Peterson et al., 2006; Todd, Horner, and Sugai, 1999). This approach also is

linked to enhanced student social skills, reduction in inappropriate behavior, and increased

academic engagement. This is particularly important for students with EBD who

characteristically engage in inappropriate behavior (Kauffman & Landrum, 2013), making

teaching challenging. Off-task, disruptive, and other problem behavior can take away between

one-third and two-thirds of instructional time (Martella, Nelson, Marchand-Martella, & O'Reilly,

2012; Wehby et al., 2003). Although teachers often try to deal with disruptions by mitigating

student behaviors (Levy & Chard, 2001), helping these students develop skills to regulate their

attention and behavior as well as actively engage in class may improve the learning environment

for all students.

Efficacy of Tiered Approach for Students with EBD Effective public health prevention

strategies include complementing universal components with targeted, selective (i.e., Tier 2

small group or individually-focused) programming designed to meet the specific needs of certain

populations (e.g., children with EBD) (Haggerty & Mrazek, 1994; National Resource Center and

Institute of Medicine, 2009). When applied to social and emotional skill development, this

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typically means coupling a universal curricular approach (Tier 1) with an array of strategies and

practices that can be flexibly adopted, adapted, and enacted by teachers in a manner that suits

their setting and the population they serve (Tier 2) (Greenberg et al., 2017; Jones & Bouffard,

2012). Research has consistently demonstrated program implementation benefits from

adaptability and compatibility of SEL programs to setting and individual needs (Durlak &

DuPre, 2008). In addition, there is growing evidence that such multi-component approaches to

social, emotional and behavioral skill development, especially for children with identified

behavioral challenges, are the most effective (e.g., Jones et al., 2017). However, given the often-

prescribed manner of universal approaches, teachers infrequently have the freedom and

flexibility to select the strategies that best fit the needs of their students (e.g., learning style, skill

level, interest, etc.).

Tier 2 social and emotional learning programs have a greater impact on youth with or at

risk of EBD compared to their counterparts. For instance, Lane et al. found that students at risk

for anti-social behavior who were unresponsive to the universal curriculum had fewer disruptive

behaviors and an increase in academic engagement following a Tier 2 social skills intervention

(2003). Additionally, in a meta-analysis of 130 secondary level prevention programs (i.e., Tier 2)

the average participant with or at risk of EBD receiving social and emotional learning

intervention surpassed the performance of approximately 70% of those in a control group. A

high mean effect size (0.72) was found for social and emotional programs on youth experiencing

externalizing behavioral challenges, whose behaviors tend to resist change through traditional

psychotherapeutic efforts at clinical levels (Durlak & Wells, 1998). Despite the evidence,

researchers have thus far prioritized developing and testing structured universal programs, rather

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than supporting teachers to adopt and implement Tier 2 strategies (Oakes et al., 2012) and assess their efficacy (Cook, Tankersley, & Landrum, 2009). This project fills this gap.

 Effective SEL Instructional Components. Effective, competency-based SEL instruction is tied to multiple positive student outcomes, both social-emotional and academic. In a recent IES literature review on social and emotional learning for elementary children, O'Conner et al. (2017, p. 4) identified three common characteristics of effective SEL programs: 1) "Use of a combination of techniques that are skills focused and environment focused" (Heller, 2013; Lantieri & Nambiar, 2012; Meyers & Hickey, 2014; Whitted, 2011); 2) "Use of a program that is sequenced, active, focused, and explicit (SAFE)" (Durlak et al., 2011); and 3) "Provision of training and technical assistance for teachers" (CASEL, 2012). In addition, the CASEL "three legged stool" analogy is widely used to illustrate the necessary components of effective SEL implementation: climate and culture, explicit skills instruction, and integration. Dallas ISD proposes a fourth additional leg of signature practices that we support. Finally, researchers have explored mediating and moderating implementation variables that influence outcomes of SST intervention with students with EBD (Gresham, Van, & Cook, 2006; Kerr & Nelson, 2010). Findings indicate that educators should implement social skill interventions within natural contexts using informal and incidental teaching strategies in order to facilitate generalization and maintenance. SELSG+'s multifaceted design reflects these characteristics.

 SEL Assessment and Differentiated Intervention While SEL instruction has an established research base, SEL assessment, although no less important, has less substantive evidence to date. As such, the proposed development and evaluation of SELSG+ addresses an important gap in the literature on a valuable topic to inform SEL policy and practice. In a recent report advocating for the use of SEL assessment as a measure to ensure quality of SEL practices

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as they are brought to scale, McKown and Herman (2020) state that "educators should integrate

SEL assessment and data review as part of a continuous improvement process" (p. 4). As part of

a series of recommendations, they propose five specific supports that educators need to facilitate

effective SEL assessment practices: incentives, information, training, ongoing support, and

resources (McKown & Herman, 2020). SELSG+ Tier 2 modules include each of these supports,

as they seek to guide educators through use of SELweb and additional data collection. The goal

is to make effective data-driven instructional decisions regarding targeted SEL interventions.

In addition to WWC evidence-based recommendations in the IES practice guide,

Reducing Problem Behaviors in the Elementary Classroom, two evidence-based models and

processes provide underlying support for the proposed SELSG+ approach. First, the

Comprehensive Integrated Three-Tiered Model of Prevention (CI3T) that emphasizes a multi-

tiered, data-driven, collaborative approach informs SELSG+'s design (Lane et al., 2014).

SELSG+ addresses the data-informed aspect of this model through uses of multiple forms of

SEL assessments to conduct screening and progress monitoring, proposes a two-tier system of

graduated supports for social and behavioral domains consisting of a differentiated set of social

and emotional skills, and emphasizes collaboration among grade level teacher teams who engage

both in-person and with other teachers across digital teacher study groups. Second, the basis for

data-based differentiation of SEL intervention strategies in SELSG+'s second tier also is based

on the National Center for Intensive Instruction's (NCII) operational definition for intensive

intervention, which is "a systematic method for using assessment data to determine when and

how to intensify intervention in reading, mathematics, and behavior" (NCII, 2013, p. 3). This is

recommended for implementation within the context of a multi-tiered system, which contains

universal secondary interventions delivered with increased levels of intensity, differentiated on

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the basis of diagnostic screening and progress monitoring data. As such, SELSG+ reflects the necessary criteria for this kind of data-based intensive intervention.

Professional Learning Practices Leading to Teacher Outcomes

The theoretical justification for the SELSG+'s professional learning model is drawn from the evidence on professional learning and validated models of professional development (Basma & Savage, 2018; Desimone, 2009; Garet et al, 2001; Garrett et al., 2019; Kraft et al., 2018; Jayanthi et al., 2018; Lemons et al., 2016; Wayne et al, 2008). As seen in the theoretical features supporting educator
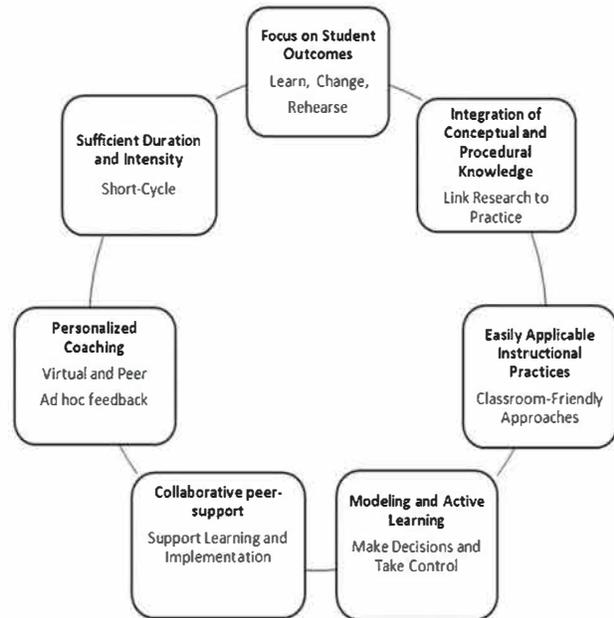

Figure 1 Features supporting educator learning

learning in Figure 2, this instruction must be linked directly to ***improving student outcomes*** (Dole, 2003; DuFour & Eaker, 2005). ***Integration of conceptual and procedural knowledge*** also is critical to help educators develop a clear understanding of research-based practices (Dole, 2003; Gersten et al., 2010). SELSG+ links professional learning to student outcomes and integrates knowledge types by having educators: (a) learn about and discuss research-based SEL instructional and assessment practices, (b) change their existing instructional approach to align with the research base, and (c) rehearse how to implement the practices in their classrooms. Additionally, ***instructional practices need to be easily applicable*** so they can be used immediately and directly in the classroom (Baker, et al., 2004; Fuchs et al., 1997; Gersten et al., 2010). The digital-curriculum materials that can be accessed via an Internet-enabled computer

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and the step-by-step teacher guides will facilitate implementation of SELSG+. Professional learning is more effective when *practices are modeled* and educators are *actively engaged in learning*, rather than passively listening to lectures (Dole, 2003; Garrett et al., 2019; Gersten et al., 2010; Hodges, 1995). SELSG+ includes video modeling with people who look like educators in authentic settings which can support teachers' acquisition and appropriate use of these skills in teacher-child interactions (Bandura 1977; 1986; Koehler, 2002; Pianta, La Paro, & Hamre, 2008). Additionally, SELSG+ emphasizes interactive practice and feedback during the TSGs which adds to instruction (Joyce & Showers, 1995; 2002).

With regards to *sufficient duration and intensity*, researchers have found that professional learning must include a minimum of 14 hours of focused activities to have positive and significant sustained impacts on teacher practice (Gersten et al., 2010; Yoon et al., 2007). SELSG+ will provide about 24 hours of focused professional learning activities to deliver SEL instruction sustained over six months of the school year. The asynchronous nature of SELSG+ will allow educators to increase duration and intensity based on their own personal professional development needs as they review, reflect, and practice within each module.

The overarching goal of the TSGs is to provide *collaborative peer-support* to help educators implement the SEL instructional practices. A previous randomized control trial of the TSG model indicates positive effects on teacher capacity and student outcomes (Gersten et al., 2010). Moreover, an in-person teacher study group protocol was effective to build and sustain teacher classroom management skills in previous efficacy studies for SEL interventions (Benner et al., 2012; Benner et al., 2013). The web-based interface allows teachers to know what their colleagues are doing and facilitates personal reflection and discussion (Blitz, 2013). Meanwhile, SELSG+'s in-person TSG protocols will encourage educators to discuss the curriculum, practice

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skills learned, and to discuss with colleagues how to effectively lead these activities in the classroom (Murphy & Laferrière, 2003). There also is empirical support for peer coaching within groups of teachers with different strengths and weaknesses (Papay et al., 2016).

SELSG+ will offer ***personalized coaching*** that provides individualized, ad hoc feedback. This is an evidence-based professional learning approach that research shoes improves quality of implementation, teacher instruction, and student outcomes, (Diamond & Powell, 2011; Kraft et al., 2018; Joyce & Showers, 2002). For example, Kraft and colleagues (2018) used meta-analytic techniques of the causal evidence on teacher coaching in the classroom, inclusive of 60 studies meeting inclusion criteria. The pooled effect size estimate of the effect of educator coaching on educator instruction was .49 (p < .001) and .18 on student achievement (p < .001). For educators in elementary schools, the pooled effect size estimate was .56 for teacher instruction (observed classroom instruction) and .22 on student achievement (p < .001). Put in context, the effect of coaching on educator practice is larger than the difference in instructional quality between novice and experienced educators (i.e., .2 to .4 SD). Additionally, Garrett and colleagues (2019) conducted a meta-analytic investigation of randomized experiments (n = 40) directed at educator practice. They found that interventions (n = 33) that included an individualized component produced the largest impacts that were .16 higher than the mean effects from studies (n =8) that did not incorporate an individualized professional learning component.

SELSG+'s approach with sustained, regular activities, collaboration, and job-embedded learning includes the essential elements for high-quality professional learning (DeMonte, 2013; Wei, Darling-Hammond, & Adamson, 2010). This approach combined with evidence-based, data-differentiated SEL instruction is likely to lead to teacher improvements in SEL instruction and desired student outcomes for SEL competence, behavior, engagement, and academics.

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Dissemination and Replication

The project team is committed to making SELSG+ and the results of this research available to a wide range of audiences, including state policymakers, district superintendents, principals, and teachers, in addition to the research community. After completion of the evaluation and establishment of its efficacy, feasibility, and acceptability, SELSG+ will be made available for purchase by individual schools or districts. Site licenses will allow educators to access the professional learning resources and student curriculum. Personalized coaching and technical support will be offered.

Our research dissemination plan includes a mix of manuscripts submitted to peer-reviewed and practitioner journals, presentations at professional conferences, and nontechnical dissemination strategies focused for practitioners and policymakers. Scholarly dissemination (peer-reviewed journal articles, scholarly conferences, etc.) will be led by Drs. Gregory Benner, Smolkowski, McKown, McGinnis-Smith, and Trusty who have a long record of publication in top-tier academic research journals, including the U.S. Department of Education and IES. We will adhere to the U.S. Department of Education's public access policy and will submit all peer-reviewed scholarly publications to What Works Clearinghouse and ERIC, and will share final research data no later than the time of publication in a peer-reviewed publication. UA, Oregon Research Institute, Rush University, and Trifoia also will make study reports available on the organizations' websites and disseminate them through social media networks using the hashtag #SELSG+.

We also plan to share research findings broadly through national, regional and state conference presentations such as the Council for Exceptional Children, American Educational Research Association, Society for Research in Child Development, and Society for Research on

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Educational Effectiveness, *Collaborative for Academic, Social, and Emotional Learning* and the

National Association for the Education of Young Children. Topics may include the iterative

process used to develop SELSG+ and the impact of SELSG+ on educator practice and student

development of social and emotional learning competencies. In addition, project staff are

experienced in presenting to diverse, nonacademic audiences (i.e., Learning Forward, ASCD

Annual Conferences). To reach policymakers, we also will present our study outcomes at

professional and practitioner conferences such as the Teacher Educators of Children with

Behavioral Disorders Conference. The dissemination plan will include targeted outreach to

practitioners. The project team will make findings accessible to a nontechnical audience to be

released throughout the study period, through short research briefs, infographics posted on

websites of university partners and Trifoia, blog posts, and webinars to further dissemination

findings for practitioner and policy-making audiences. Moreover, we plan to disseminate results

directly to educators and service providers through our decade-long Whole Child Initiative

between UA, Alabama State Department of Education, and civic leadership through which Dr.

Benner provides professional learning support to many Alabama school districts.

MANAGEMENT PLAN

The project has four overarching goals with clear outcomes for each one (see Table 3).

Table 3 Goals and measureable outcomes for SELSG+

Goals	Outcomes
1. To design and develop a digitally-delivered Tier 1 and Tier 2 SEL curriculum with data-based differentiation for K-3 students	a. Complete development of digital version of Tier 1 intervention (*We Have Skills!,* 8 lessons). b. Complete development of digital version of Tier 2 intervention (*Skillstreaming,* 60 lessons). c. Complete development of tool to aid assignment to Tier 2 intervention groups by educators using assessment and other data.

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	d. Complete development of tool to add creation of Tier 2 lesson plan for a particular small group or individual.
2. To craft digital and in-person professional learning to train teachers and provide ongoing support as they implement the program	a. Complete development of digital professional learning course (12 modules). b. Develop protocols for in-person teacher study groups. c. Develop functionality to support personalized web coaching.
3. To establish What Works Clearinghouse moderate evidence for SELSG+ through a randomized wait-list control study	a. Enroll 120 teachers in the project evaluation b. Enroll 480 students in the project evaluation c. Complete data collection at pre, post, and follow-up time points d. Analyze data according to proposed plan
4. To disseminate the results in peer-reviewed publications, reports, and through popular and social media channels	a. Publish the evaluation results in at least 1 peer-reviewed publications. b. Produce 1 case study about the design research and development process. c. Publish at least 3 articles in popular press for educators. d. Promote the project through a strategic social media campaign using at least three channels.

Management Plan and Timelines

The project is structured with two phases: 1) SELSG+ design research and development (Years 1 and 2) and 2) the project evaluation (Year 3). Detailed timelines appear below.

Table 4 Design Research and Development Timelines

Project Tasks (Year 1)	Mo 1	Mo2	Mo 3	Mo 4	Mo 5	Mo 6	Mo 7	Mo 8	Mo 9	Mo 10	Mo 11	Mo 12
Task 1. Develop prototype and conduct focus groups												
Develop objectives, content matrix, and requirements	■	■										
Draft content and create prototype for review		■	■	■								
Recruit and screen participants, informed consent				■	■							
Focus groups					■	■						
Au						■	■					
								■	■	■	■	■

Project Tasks (Year 2)	Mo 13	Mo 14	Mo 15	Mo 16	Mo 17	Mo 18	Mo 19	Mo 20	Mo 21	Mo 22	Mo 23	Mo 24
Task 2. Think-aloud protocol and second iteration												
Recruit and screen participants, informed consent	■											
Think-aloud protocol		■	■									
Audio transcription and data analysis		■	■									
Develop requirements and prioritize			■									
Revise and complete second iteration				■	■	■	■					
Task 3. Scenario-based usability testing												
Recruit and screen participants, informed consent								■				
Usability testing									■			
Audio transcription and data analysis										■	■	
Develop requirements and prioritize											■	■

Table 5 Project Evaluation Timeline

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Project Tasks (Year 3)	Mo 1	Mo2	Mo 3	Mo 4	Mo 5	Mo 6	Mo 7	Mo 8	Mo 9	Mo 10	Mo 11	Mo 12
Task 1. Finalize intervention												
Complete final iteration	X	X	X									
Task 2. Project evaluation												
Recruit and screen participants, informed consent	X											
Pretest	X											
Intervention		X	X	X	X	X	X	X				
Posttest								X				
Follow-up Assessment										X		
Data analysis and dissemination									X	X	X	X

PI Benner will direct all project activities, ensure the project remains on time and within budget, and guarantee that deliverables meet project objectives and quality assurance goals. He will coordinate regular meetings with the project team and subteams. PI Wendt will administer the subaward at Trifoia and oversee all development activities. PI Trusty will lead the design research and development phase and PI McKown and consultant McGinnis-Smith will serve as an advisors and content experts. PI Trusty will work with educators to gather feedback about SELSG+ through the design research activities and will format feedback for use by the production team at Trifoia. They will be responsible for graphic and instructional design, integration of the student and educator materials into the web-based platform, and custom software development. The team has dedicated staff who will perform quality assurance for the product. Co-PIs Smolkowski and Parton will lead the project evaluation including research design, measure development, data collection, and data analysis. PI Trusty will assist with recruitment. To maintain objectivity, a firewall will be established to ensure that PI Benner and the design team (PIs McKown, Trusty) will have no access to the project evaluation database nor perform any evaluation analyses. PI. Benner will lead dissemination with PIs Smolkowski, McKown, and Trusty to ensure that outcomes of SELSG+ are appropriately recognized, demonstrated, and implemented on a broad scale.

Procedures for Ensuring Feedback and Continuous Improvement

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In addition to the formalized evaluation procedures detailed in the next section, additional types of formative assessment will also be used to monitor project activities and teachers' levels of participation, to obtain user and student feedback, and to facilitate continuous improvement. While teacher voice is a strong aspect of the design research and development phase, ongoing formative teacher feedback will be additionally gained as needed through bi-monthly check-ins conducted by coaches and other members of project staff, online discussions, and analytics from the web-based platform. The goal of this feedback is to provide the project leadership team with accurate information about participants' level of participation and implementation, opinions about course content and activities, and potential barriers. Subsequent programmatic changes and improvements will be made in response to this feedback. In addition, continuous improvement in the field will be encouraged and celebrated through the project team sharing regular reports detailing interim project findings with both the teacher participants and their school and district level leadership. To this end, the project team hopes to obtain ongoing administrative support of quality SEL training and implementation.

PROJECT EVALUATION

The goal of the randomized control project evaluation is to determine the intermediate educator and student outcomes from the intervention (see Table 6).

Table 6 SELSG+ Evaluation Outcomes and Measures

Student Outcomes			
Outcome	Measures	Data Collection	Timing
Attendance	Attendance reports	Teacher report	Weekly and Posttest
Academic Performance	STAR Reading and Math assessments	Teacher report	Pre- and Posttest
Engagement, Behavior, and Academic Ratings	ACES	Teacher report	Pre- and Posttest
SEL Competence	SELWeb	Student measure	Pre- and Posttest

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SEL Skills - Progress Monitoring	ESBA	Teacher report	Weekly
Acceptability	Rating measure	Student report	Posttest
Teacher Outcomes			
Outcome	Measures	Data Collection	Timing
Beliefs	TSBS	Teacher self-report	Pre- and Posttest
Knowledge	TSBS	Teacher self-report	Pre- and Posttest
Self-Efficacy	TSES	Teacher self-report	Pre- and Posttest
Wellness (Burnout)	TBS	Teacher self-report	Pre- and Posttest
Fidelity of SEL Implementation	Multiple	Teacher self-report, digital tracking	Weekly
Usage & Engagement	Electronic data	Digital tracking	Continuous
Feasibility, Acceptability, and Satisfaction	Rating measure and open-ended questions	Teacher self-report	Posttest
Usability	Rating measures and SUS	Teacher self-report	Posttest

Sample and Recruitment Teachers will be recruited in grade-level teams (or, in smaller schools, multi-grade teams), and will be grouped into digital teacher study groups of no more than 10 teachers in order to promote interaction and engagement online. We will enroll 144 educators to allow for 20% attrition, to end with 120 educators (60 per condition). We'll enroll 4 students per teacher to end with 240 per condition. Participants will be drawn from elementary schools within designated Qualified Opportunity Zones (QOZs) in Alabama, Mississippi, Georgia, and Florida. We use broadcast methods including social media and direct mail/email to recruit additional participants. Participation in design research activities will not preclude participation in the project evaluation. Interested teachers will be asked to complete a screening questionnaire and, if qualified, to consent to participate in the study. Participants will receive $500 for completing all activities. All evaluation activities will be approved by the UA IRB.

Research Design and Methods We will create six grade level teacher study groups of ten elementary educators each and will randomly assign at the study group level to intervention (SELSG+) or comparison (business-as-usual), with blocking to ensure there are six study groups

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in each condition. Educators in the comparison condition will participate in professional learning community activities occurring at each school. Educators in the SELSG+ condition will be trained on and implement the SELSG+ practices in their classroom with students over a 25-week period, while teachers in the business-as-usual condition will continue with normal teaching practices. Assessments will be collected at pretest, 25 weeks later at posttest, and a follow-up 10 weeks after the posttest. At all three time points, all educators will complete knowledge and self-report assessments for self-efficacy and wellness. In addition, SELSG+ educators will complete fidelity checklists for each module and for educator in-person study group procedures using the online platform which will prompt them for this information. Usage and engagement data will be collected throughout by the online platform.

Teachers in both groups will also facilitate measurement of student outcomes. One week before the intervention period (i.e., implementation of Tier 1 student curriculum), pretest data on selected outcomes, including SEL skills, attendance, and academic engagement, will be collected for all students across both treatment and control groups. In addition, teachers in both groups will select up to four students determined to be "at risk" for behavioral issues on the basis of multiple criteria: 1) Teacher nomination based on in-class observation and interaction with students and 2) Data based on screener SEL assessments built into SELSG+. All educators in both conditions will collect and report on behavior and academic performance during the intervention for these four selected "at risk" students. At posttest, two weeks after the end of the intervention program, all educators will again complete knowledge and self-report assessments and collect student posttest data. In addition, educators in SELSG+ condition will provide feedback about feasibility, acceptability, satisfaction, and usability of SELSG+. Educators in the control condition will be given access to SELSG+ for use following project completion.

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Student Measures <u>Attendance</u> will be collected from weekly teacher attendance reports before, during, and after the intervention. <u>Academic Performance</u> will be measured pre/post using STAR reading and math online assessments to evaluate student achievement. The STAR assessments have demonstrated high internal reliability (Reading alpha > .93; Math alpha > .90), test-retest reliability (Reading alpha > .54; Math alpha > .76) and strong predictive and concurrent validity (Learning, 2014). <u>Engagement, Behavior, and Academic Ratings</u> will be measured pre/post using the Academic Competence Evaluation Scale (ACES) (DiPerna & Elliott, 2001). The teacher form consists of 2 scales: Academic Skills (33 items) and Academic Enablers (40 items). Studies of score reliability (> .90), teacher (.88 to .97) test-re-test reliability, and convergent and construct validity show the ACES possesses adequate psychometric properties (DiPerna & Elliott, 1999, 2001; Elliott et al., 2004). <u>SEL Competence</u> will be measured using SELweb and the ESBA as previously discussed (see Project Design). <u>Acceptability</u> will be measured using age-appropriate Likert-like questions read by the teacher to the class. Students will mark answers using a numeric and pictorial e.g., happy to sad faces representation of the rating scale to allow all students to participate regardless of reading ability.

Teacher Measures <u>SEL Knowledge and Beliefs</u> will be measured using the Teacher SEL Beliefs Scale (TSBS; Brackett et al., 2012). The TSBS is a 10-item Likert scale that assesses educators' knowledge and beliefs about SEL (comfort with teaching SEL, commitment to learning about SEL, and perceptions of support within the school culture for SEL). It has demonstrated content validity and concurrent validity and the subscales have shown good internal reliability (α= .74 to .82) as has the full scale (α= .79). <u>Self-efficacy</u> will be assessed using the Teachers' Sense of Efficacy Scale (*TSES*; Tschannen-Moran & Hoy, 2001). TSES is a 24-item Likert scale developed for educators to assess their own efficacy in three areas of

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teaching: Classroom management, instructional practices, and student engagement. Developers reported very acceptable alpha levels (overall alpha of .94; and sub-scale alphas for Engagement .87, Instruction .91, and Management .90). Construct validity and discriminative validity data were reported and indicated the scale to be psychometrically sound. <u>Teacher Wellness</u> in this study is operationally defined by level of stress and burnout, as measured by the Teacher Burnout Scale (*TBS*; Seidman & Zager, 1986). The TBS is a 21-item Likert scale that assesses educators' burnout, specifically around career, administrative support, coping with job-related stress, and attitudes towards students. It has demonstrated content validity through exploratory and confirmatory factor analysis, and the subscales have shown good internal reliability (α= .72 to .89) and test-retest reliability (α= .56 to .82). <u>Usage and Engagement Data</u> will include data such as number and time of logins and time spent viewing content items. For online collaboration features, we will capture quantitative (date and time of posts and number of different types of posts) and qualitative data (discussion post content which will be analyzed for the degree to which posts meet pre-determined measures for reflection and interactivity). <u>Feasibility, acceptability, and satisfaction</u> will be measured using a modified subset of the Likert-like and open-ended questions developed for the design research questionnaires. <u>Usability</u> will be assessed by the SUS implemented as in the design research.

 Fidelity of Implementation Educators will complete self-report checklists for in-person study groups and student instruction. The research team will develop these based upon the professional learning protocols and the student curriculum for each lesson in Tier 1 and Tier 2. We also will track online activity including materials viewed and time spent on the course site through the usage and engagement data collected from the course web site.

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Data Analysis Plan The statistical analysis will compare SELSG+ teacher study groups to those who received typical professional learning activities on the measures summarized in the Table 6. We will use a mixed-model ANCOVA (a multilevel model), given educators are nested within study groups and students within educators. The statistical model compares the two conditions at posttest using a pretest measure as a covariate. It partitions variance into three components, study groups, educators, and students, with condition at the study group level, although we will not include the student level for educator outcomes. The model allows for a comparison of conditions while accounting for nonindependence of observations.

Given that the pilot study will be underpowered, we will rely heavily on effect size estimates to determine whether SELSG+ is operating as intended. Effect size estimates will be calculated using procedures specified by the WWC (2019). It is possible that comparison educators, who receive BAU professional learning, may not remain clustered in groups, so the analytic model would need to account for potential heterogeneity of variances across conditions (Roberts & Roberts, 2005). In such a case, we would adopt an analysis approach for partially nested (Baldwin, Bauer, Stice, & Rohde, 2011; Bauer, Sterba, & Hallfors, 2008), which members of our team have used in other studies (e.g., Clarke et al., 2016). For students, who remain nested within educators, we would make the necessary adjustments that assume students nested within educators but educators partially nesting in study groups (Allison, 2009; Graham, 2009).

Minimally detectable effect sizes (MDES) for the difference between conditions depend on a number of factors that may change during implementation. For example, teachers who receive BAU professional development may or may not participate in clusters, and experienced covariate adjustments and intraclass correlations may vary from assumptions (Murray, 1998).

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For these reasons, power calculations only "help us decide whether we need *n* or 2*n* subjects but not *n* or *n* + 2" (Oakes & Feldman, 2001, p.7). MDES estimates are similarly approximate. We estimate MDES values between 0.20 and 0.50 standard deviations (Hedges's *g*) depending on the number of students per teacher (3 or 4), pretest covariate adjustment (r^2 from .25 to .50), intraclass correlation (.025 to .20), the number of professional development groups per condition (4 to 10), the association between professional development group and teacher- and student-level outcomes, and after accounting for tests of multiple dependent variables. The high MDES values, however, from around 0.40 to 0.50, assumes a worst-case scenario. We do not expect such a scenario, and the best-case scenario is similarly unlikely. From Dr. Smolkowski's experience with over 30 school-based clustered and partially clustered randomized trials, this study will likely have power to detect effects below about 0.25 to 0.35 standard deviations.

We will examine fidelity data across the two methods (checklist, online usage data). Additionally, we will evaluate any barriers to participation during the earlier stages of the project and adjust as needed. We also will include fidelity in the analyses as a covariate to see if lower levels of engagement by the intervention educators predicted lower positive outcomes on the teacher and student outcomes. If fidelity is lower than expected, the research and design teams will consider changes to the intervention to make adherence easier and to the checklist materials to improve fidelity to implementation.

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