

Developing Middle School Students' Social Emotional Learning Skill Applications through Technology Enhanced Collaborative Learning	
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Project Overview and Alignment with EIR Priorities

This proposal is for an Early-Phase EIR program grant, addressing Absolute Priority 1— Demonstrates a Rationale and Absolute Priority 4— Field-Initiated Innovations—Meeting Student Social, Emotional, and Academic Needs. We propose to develop and administer a technology-enhanced version of the Social Skills Improvement System Classwide Intervention Program (SSIS CIP), an evidence-based social-emotional learning (SEL) skills program, to middle-grade, high-need students in classrooms and schools in rural school districts in Northern Michigan. The program will teach 12 SEL units in self-management, social awareness, and relationships and provide teacher training and support. The program comprises engaging SEL content and interpersonal collaboration among students and with teachers. The program will be delivered through ETS’s Platform for Collaborative Assessment and Learning (EPCAL), facilitating practice, and enabling real-time monitoring of student practice attempts based on students’ responses and conversations, permitting immediate teacher review and feedback to students. An independent party will evaluate program implementation fidelity and effectiveness in enhancing students’ engagement, social and emotional skills, and academic performance.

A. Significance

A.1. National Significance

Social-emotional learning (SEL) “refers to a process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions” (Jagers et al., 2019, p. 162). SEL has been identified in congressional testimony as critical for preparing students to thrive in school, career, and life (Social and Emotional Learning and Whole Child Approaches in K-12 Education, 2022) and is associated with higher achievement in school and educational

attainment, greater workforce participation and success, increased civic participation, reduced crime, and greater well-being and other life outcomes (Durlak et al., 2011; Durlak et al., 2022; Greenberg, 2023; Kautz et al., 2014; Roberts et al., 2007; OECD, 2015).

SEL skills development has its greatest impact on higher risk, low-achieving students, low-income families, and racial/ethnic minority groups (DiPerna et al., 2016; Domitrovich et al., 2017; Taylor et al., 2017; West et al., 2020; Yeager et al., 2019). The Every Student Succeeds Act (ESSA) provides various opportunities to support school-based social-emotional skills intervention programs (Grant et al., 2017). This support in the ESSA legislation and the 2022 congressional hearing cited in the previous paragraph are clear signs of the U.S. government's recognition of *the national significance of promoting social and emotional learning*.

A.2. Promising New Strategies Building on Existing Strategies

Meta-analyses of SEL programs have found both short- and long-term gains on school outcomes, both academic and in social-emotional skills and physical and mental health (Bierman et al., 2008; Durlak et al., 2010; Durlak et al., 2011; Durlak et al., 2022; Greenberg, 2023; Nelson et al., 2003; Domitrovich et al., 2017; Taylor et al., 2017). Greenberg's (2023) summary of 12 meta-analyses, over 800 studies from PreK to 12th grade (also Durlak et al., 2022) found positive effects of SEL programs on SEL skills, positive social behaviors, reduced conduct problems, reduced emotional distress and academic performance (grades and test scores) with effect sizes ranging from .23 to .57. Programs were equally effective at middle and high school (Durlak et al., 2011), and program-related gains persisted (Taylor et al., 2017). SEL programs are cost-effective, particularly with high-quality program implementation (Kendziora & Osher, 2016): SEL programs return \$11 for every \$1 invested (Belfield et al., 2015).

Domitrovich et al. (2017; Durlak et al., 2011) summarizes effective intervention approaches. They are SAFE--Sequenced (entail a connected set of activities), Active (promote active learning

approaches, such as roleplays), Focused (specifically devoted to SEL skill development), and Explicit (SEL skills are identified so students know what is expected of them). Also, high-quality program implementation, with professional development services (preprogram training, ongoing technical assistance via consultation) is important for efficacy (Domitrovich et al., 2017).

A.2.a. The Social Skills Improvement System Classwide Intervention Program (SSIS CIP)

SSIS CIP aligns with the SAFE guidelines and includes preprogram training and ongoing technical assistance, consistent with findings on effective intervention programs (Domitrovich et al., 2017). SSIS CIP has proven efficacious in prior RCT research for increasing social-emotional learning (SEL) skills, decreasing problem behaviors, and improving academic engagement and achievement (DiPerna et al., 2018; DiPerna et al., 2015). The CIP is one of three SEL programs recognized as a Tier 1 Strong program by the What Works Clearinghouse and is a Collaborative for Academic, Social, and Emotional Learning (CASEL) SElect program.

SSIS CIP is a set of 30 skill units, each with 3 lessons administered by a teacher to teach elementary and middle-school students a set of social-emotional learning (SEL) skills (Elliott & Gresham, 2007; 2020). The specific, discrete social-emotional learning skills that form the basis for the lessons were identified in prior research by a diverse sample of over 2,000 students, teachers, and parents as either “important” or “critically important” for student success (Elliott & Gresham, 2007). In this project, due to time available for the lessons, we limit focus to a subset of 12 skill units, presented in Table 1. These were selected from the 30 in the SSIS CIP set based on age appropriateness and for an emphasis on social awareness and relationship skills, as these skills are more suited to development in a collaborative learning context than are other SEL skills (the exception is that we include two self-management skills as the first two lessons; experience has shown that these are useful lessons to introduce students to the material).

Table 1. SSIS CIP SEL Skill Units/Lessons Mapped to CASEL Constructs with Roleplay Examples (original lesson numbers in parentheses)

Skill Unit/Lesson Name	Construct	Example Roleplay Applications
1. Listen to others	Self-Management	"While you're playing a game, your parents talk to you about dinner plans"
2. Follow the rules	Self-Management	"Your friends ignore the teacher"
3. Take turns when you talk	Relationship Skills	"You have a question for your teacher who is speaking with another adult"
4. Get along with others	Relationship Skills	"You are trying to decide who goes first in a game with your friends"
5. Do nice things for others	Social Awareness	"A classmate's notecards fall out of their backpack all over the floor"
6. Ask others to do things with you	Relationship Skills	"You are reading a complex book. You want to discuss it with someone"
7. Introduce yourself to others	Relationship Skills	"On the first day of school, the teacher wants everyone to introduce themselves"
8. Stand up for others	Social Awareness	"You receive a mean message being texted around about a classmate"
9. Make others feel better	Social Awareness	"A classmate accidentally drops a glass object in class"
10. Make compromises	Relationship Skills	"You and your classmate get in line at the same time to get tickets and must decide who goes first"
11. Forgive others	Social Awareness	"A classmate promised to watch your performance but missed it because of another obligation"
12. Resolve disagreements calmly	Relationship skills	"You and a classmate were assigned to plan a presentation but you disagree on how to do it"
Notes. Lessons are a subset of SSIS CIP SEL (Elliott & Gresham, 2007, 2020). Construct is based on an alignment study to the CASEL framework (Borowski, 2019). Roleplay examples are abbreviated. At the end of the role-play description, the question is "what would you do/say?" Each SEL Skill Unit consists of three 25-minute lessons to be taught over the course of a week.		

For each lesson, SSIS CIP is administered as a sequence of instructional events (see Table 2).

The **Tell–Show–Do–Practice–Monitor–Generalize** structure is at the heart of each skill unit.

These 6 instructional events create a Sequenced, Active, Focused, and Explicit, (SAFE) learning

experience and allow for an efficient, engaging pace of 25 minutes per lesson. SAFE refers to the recommended practices associated with effective skill training based on the Durlak et al. (2010; 2011) meta-analyses.

Table 2. Instructional Events in SSIS CIP SEL

Instructional Event	Description
Tell	<i>Coaching.</i> <i>T</i> defines the skill and keywords, lists steps to perform the behavior.
Show	<i>Modeling.</i> <i>T</i> gives examples of positive and negative social-emotional skills using enactments, pictures, and video clips and leads a related discussion.
Do	<i>Discussing & Modeling.</i> <i>S</i> reviews and discusses the definition of and behavioral steps, then a few students act out a teacher-guided situation and the other students discuss.
Practice	<i>Behavioral Rehearsal.</i> 2-3 <i>Ss</i> perform roleplay together in front of the class. <i>T</i> reinforces appropriate skill practice and provides feedback for skill step adherence.
Monitor	<i>Assessment of Skill Use.</i> <i>S</i> self-evaluates skill step effectiveness based on roleplay session; <i>T</i> provides feedback on skill steps needing improvement.
Generalize	<i>Applying Skills in Multiple Settings.</i> <i>Ss</i> brainstorm/discuss new application domains (new situations) and some <i>Ss</i> roleplay the new situations.
Notes. Each instructional event occurs in sequence for each of the lessons listed in Table 1. <i>T</i> = teacher; <i>S</i> = student(s). Elliott and Gresham (2020, p. 7) provide additional details.	

The SSIS CIP can be used anywhere with an internet connection (all participating schools have internet connections and we will supply Chromebooks to students and teachers). The program fits instructionally into homerooms, ELA and Health Education classes, and can be used in other classes. The current SSIS CIP is efficient and cost-effective. To teach 12 skills requires teachers no more than 4.5 hours to learn to implement the program with a high level of integrity. (Technology enhancement, discussed next, will require an additional 2 hours.)

A.2.b. EPCAL SSIS CIP SEL

To enhance the effectiveness of SSIS CIP, we will present SSIS CIP SEL lessons and collect and monitor student responses, including their discussions, using the EPCAL platform. Figure 1 shows an example of the 12th (30th) SSIS CIP SEL lesson presented in the standard, teacher-directed format in the left panel, and in the EPCAL format on the right hand panel.

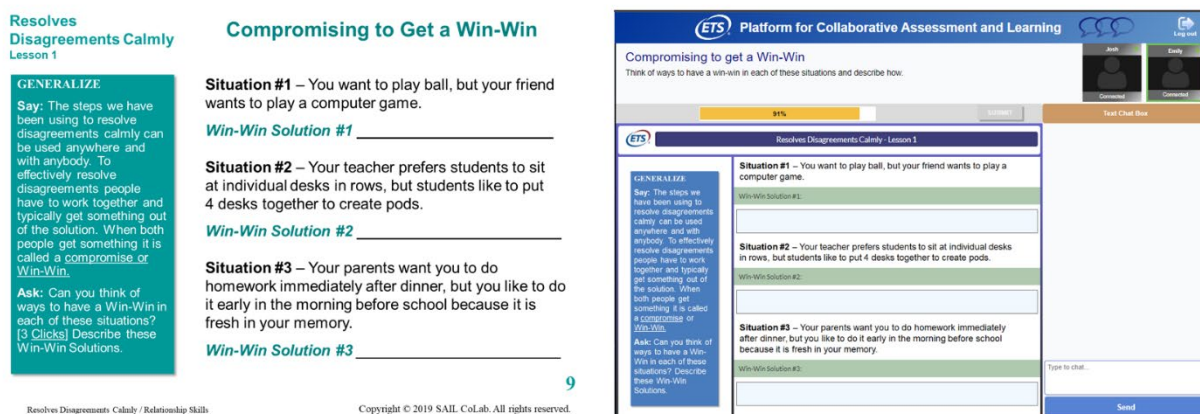


Figure 1. Example of the standard lesson (left panel), and the EPCAL version of that lesson (right panel).

Both panels in Figure 1—standard and EPCAL—show the teacher version. This is indicated by the teacher instructions in the left-hand side box for each system (green box for the standard; blue box for EPCAL). In the student version in the EPCAL format the student does not see the teacher instructions in the left (blue) box. One difference between the standard and EPCAL versions is that students have a *text chat box* available to them (right-hand side), in which they are encouraged to discuss the task. All discussions are recorded and analyzed in real time.

There are three primary purposes of EPCAL delivery of the SSIS CIP SEL content. First, EPCAL provides practice affordances and therefore its use will increase the number of skill practice attempts compared with standard delivery. For example, with standard delivery, teachers select a few students to roleplay during the *practice* and *generalize* events; With EPCAL all students can roleplay during the *practice* and *generalize* events (see Figure 2). The importance of practice for skill acquisition, in the number of practice attempts or the time spent practicing has been foundational in education since Thorndike's law of exercise (1932) and the ubiquitous law of practice (Newell & Rosenbloom, 1982), is the basis for acquiring expertise in any domain (Ericsson et al., 1993), and where knowledge components can be suitably defined, such as with intelligent tutoring systems, the number of practice opportunities necessary to achieve mastery in

diverse academic contexts can be estimated (Koedinger et al., 2023, estimate about 8), indicating its regularity, with little variation between students in learning rate.

ETS Platform for Collaborative Assessment and Learning

Role Play YOUR Situation

1. Write one situation where you had a disagreement.
2. Respond to your teammates situations.

75% SUBMIT

TASK	SITUATIONS	How would you respond to your teammates situations?
1	Mom wanted me to take my brother to the movies with my friends and we got in an argument.	EJ: just take him one time
2	One of the dads on my soccer team disagreed with the ref and got really mad and got kicked out of the game.	
3	I think my friend took my bracelet since I saw her wear it, but she says its hers and that I just lost mine.	

When you finish, pick one of the situations described and then role play it with each student taking a turn showing how they would respond to resolve the disagreement.

Remember to practice using one of the Resolution Strategies – **accommodation, collaboration, or compromise** – and to provide each other with feedback.

ready, set ACTION

Text Chat Box

Josh: For the first one, maybe just take him one time.

Emily: she wants me to take him all the time

Type to chat...

Send

Figure 2. EPCAL display for Lesson 12 (see Table 1), *Generalize* (see Table 2). Students either generate or are provided with situations and are asked to respond to those situations by typing in the middle (blue) column. They discuss responses with each other in the Text Chat Box on the right-hand side.

Second, EPCAL provides feedback (automated monitoring and intelligent facilitation) on student engagement and performance. This feedback can supplement teacher monitoring--disengaged students might be encouraged to participate, struggling students might receive additional help by the EPCAL system. EPCAL provides several kinds of feedback: (a) detect off-topic (or inappropriate) messages (through keyword matching) then prompt the student to stay on target or avoid certain language; (b) detect disengagement by lack of participation activity (failure to respond, or to enter message in text chat) or long latencies in responding, then encourage engagement as a remedy; and (c) evaluate multiple-choice responses, then provide

feedback based on the specific responses chosen (Hao et al., 2017; Hao et al., 2019). The role of feedback in learning is extensively documented, from Thorndike's (1932) law of effect to a meta-analysis on educational feedback effects that examined 435 studies (Wisniewski et al., 2019), concluding that "feedback on average is powerful, but some feedback is more powerful."

Third, EPCAL provides classroom management support. The EPCAL teacher dashboard provides summary statistics of student participation (e.g., counts of number of words a student is writing, as well as the actual content) which the teacher can use for real-time monitoring or for later review. The dashboard allows a teacher to "listen in" on a groups' sessions by sharing the screen from that session; the teacher can send feedback messages directly to an individual or group, which appear in the text chat box. The student has available a yellow "raise your hand" button (see Figure 2), which appears instantly as a message to the teacher to get help. Although these features are optional in the sense that the system will function properly (deliver lessons, record responses, provide practice and feedback) even if a teacher chooses not to use them, they are available. From a time-management perspective of classroom management (Kauchak & Eggen, 2008), due to its automatic record keeping and other features just described, EPCAL reduces the proportion of allocated class time devoted to activities other than academic learning, engaged time, and instructional time, and it increases engaged time, serving as a classroom management tool. Observational and RCT evidence attests to the efficacy of classroom management on student outcomes (Herman et al., 2020).

In sum, this background provides the justification for *Absolute Priority 1*. It documents and demonstrates a rationale both for the SSIS CIP SEL materials and for the EPCAL delivery system establishing the evidence requirement for this tier of grants that is, *prior evidence of effectiveness that demonstrates a rationale*.

B. Quality of Project Design

B.1. Conceptual framework and Logic Model

The primary conceptual framework underlying our effort to teaching students important SEL skills is the CASEL competency framework. The CASEL framework has become the dominant competency framework from both research (Durlak et al., 2015) and policy perspectives in informing state SEL standards and SEL practice (Frye et al., 2021). The framework is based on three meta-analyses (Durlak et al., 2011; Durlak, et al., 2010; Taylor et al., 2017) and lessons learned in implementing SEL programs in schools (Durlak et al., 2015; Weissberg, 2019).

The CASEL framework (Borowski, 2019; Jagers et al., 2019) proposes that students, through their classrooms, schools, homes, and communities acquire a set of five social and emotional competencies—self-awareness, self-management, social awareness, relationships skills, and responsible decision making. These competencies, when acquired and practiced, improve student attitudes and school climate, lead to positive social behaviors and relationships, greater academic success, fewer conduct problems, less emotional distress, less drug use, increased high-school graduation and college and career readiness, improved mental health, reduced criminal behavior, and engaged citizenship (Borowski, 2019). The framework also outlines district and school theories of action, which entail building foundational support, strengthening adult SEL competencies, promoting SEL for students, and practicing continuous improvement.

The SSIS CIP proposed here is CASEL-content-aligned and evidence-based. SSIS CIP has demonstrated this alignment repeatedly via confirmatory factor analysis and item content reviews conducted by CASEL personnel. The SEL CIP has undergone CASEL Program reviews in 2018 and 2021 and met their highest standard as an SElect Program.

The CASEL Competency Framework has been used by the SSIS SEL author team to build assessments that align with both the CASEL Framework and the content of the SSIS SEL CIP.

Thus, each of the multi-informant SSIS SEL assessments (brief screeners, progress monitoring scales, and diagnostic rating forms, Table 4) is scored and compared with a common 4-level — *Emerging, Developing, Competent, and Advanced* — reporting system for all K-12 students.

The other part of our conceptual framework concerns the use of EPCAL to deliver the SSIS CIP SEL lessons, collect student responses and conversations, enable student interactions using the text chat facility, and monitor and provide feedback to the student. The use of EPCAL will increase student skill practice opportunities compared to the standard delivery system because each student will be asked to practice skills by discussing those skills with a small group of 3 students, roleplaying those skills, and entering responses to questions such as “how would you respond to this situation?” There will be more practice opportunities with EPCAL compared to the standard system due to constraints of teacher-directed classroom-wide implementation. Increased practice opportunities relates to increased skill mastery (Koedinger et al., 2023). Additionally, by monitoring student activity, EPCAL provides feedback to students to supplement feedback teachers might provide. Feedback increases student outcomes (Wisniewski et al., 2020). EPCAL also provides classroom management capabilities to assist teachers, including student record keeping, teacher monitoring of different groups, and capabilities for teachers to listen in to groups and to respond instantly to student questions. Classroom management has been shown to relate positively to student outcomes (Herman et al., 2022).

The CASEL Competency Framework with EPCAL delivery of the SSIS CIP SEL lessons provides the basis for why the proposed intervention should lead to the successful development of social and emotional competencies in students along with increased student achievement, motivation, and engagement. In addition, the CASEL framework outlines conditions for systemic social emotional learning (Mahoney et al, 2020), an approach to create equitable learning

conditions for students regardless of background by building personal and professional capacity among adults to implement and continuously improve programs and practices and to create a culture of promoting social and emotional competencies. This systemic view is reflected in our logic model (see Appendix G), which emphasizes the role of teachers for implementation, schools and the larger community for support, and business planning to sustain the activity.

B.2. Project Goals, Objectives, and Outcomes

Table 3 presents project goals, objectives, and outcomes. These are clearly specified and measurable and include year and quarter of completion and person responsible. Quarterly and annual reports will document progress and lessons learned. The development team will prepare first draft reports, quarterly and annual, with the evaluation team providing formative feedback; both teams will contribute to revised reports.

The general plan is to identify the lessons with teacher interviews (the Table 1 list will be followed, unless discussions with teachers result in changes), then, using the standard SSIS CIP materials, to conduct cognitive labs (with a few students and teachers) and adjust lessons as necessary. Interviews will be developed to measure teachers' and students' reactions to the lessons, adjusting as needed. Then, lessons will be hosted in the EPCAL platform and additional cognitive labs will be conducted, with lessons learned incorporated and documented. Following this, pilot studies will be conducted with a larger group of 20 students who go through all the lessons. The end of the first, going into second year will focus on teacher training, including workshops, a post-training survey, and the launching of a website. Later in the second year, after MOUs are signed and Chromebooks delivered, pretesting, delivery, and posttesting will occur and be overseen by the independent evaluator. If the target numbers are not met, an additional round will be conducted in the third year (hence, a second year of data collection is scheduled).

Table 3. Project Goals, Objectives, Activities, Outcomes/Performance Measures, Schedule, and Responsible Party

GOAL 1: Develop Intervention to Increase Students' SEL, Achievement, Engagement				
Objectives	Activities	Outcomes/ Performance Measures	Year/Q	Responsible
1. Identify SSIS CIP Lessons	1.1. SSIS CIP materials confirmed	3 Ts, 3 Ss perceive lesson topics are important, understandable, age-appropriate; adjustments made to finalize lessons	1/1	
	1.2. Cog lab interview developed for S, T		1/2	
	1.3. Cog labs of S, T conducted		1/2	
	1.4. Feedback incorporated into lessons		1/2	
2. Platform SSIS CIP in EPCAL	2.1. 12 skill units prepared in EPCAL	EPCAL SSIS CIP completed	1/3	
	2.2. EPCAL lessons learned documented	Document published	1/3	
3. Conduct Cog Labs at North Ed	3.1. Conduct Cog Labs. 3-person groups	3 T, 9 S per T x 2 sessions. Practice 3 skill units = 9 lessons	1/3	
	3.2. Document cog lab lessons learned		1/3	
4. Conduct Pilot Testing at North Ed	4.1. Pilot schools recruited	20 students complete all 12 skill units (2 teachers, 10 students from each of the 2 classrooms)	1/4	
	4.2. Contracts signed		1/4	
	4.3. Pilot testing conducted at schools		1/4	
5. Report on Findings	5.1. Formative quarterly updates	Quarterly team updates, annual lessons-learned reports	1/1-4/4	
	5.2. Feedback on quarterly updates		1/1-4/4	
	5.3. Annual summary reports issued		1/1-4/4	
	5.4. Feedback on annual reports		1/1-4/4	
GOAL 2: Develop PD support: Preprogram training, Ongoing technical assistance via consultation or coaching				
6. Develop Preprogram Teacher Training	6.1. Develop EPCAL SSIS CIP training	Training meets teachers' needs to implement program based on T survey findings	1/4	
	6.2. Develop post-training T survey		1/4	
	6.3. Conduct training workshops		2/1	
7. Develop Technical Assist. Capability	7.1. Develop technical assistance	Technical assistance in place, approved by 2 teachers	2/1	
	7.2. Test and get approvals		2/1	
	7.3. Staff for live support		2/1	
8. Launch project website	8.1. Develop website	Website launched, approved by 2 teachers	2/1	
	8.2. Administer survey on website		2/1	

GOAL 3: Evaluate implementation & impact					
9. Recruit main study sites	9.1. Recruitment and MOUs signed	800 students, 80 classrooms, 10 schools recruited; > 50% students from high-needs schools	1/4		
	9.2. Site preparation activities (e.g., deliver 800 Chromebooks)		1/4		
10. Administer Measures, Intervention	10.1. Pretest measures administered	4 measures collected from 800 students;	2/2,3/2		
	10.2. Intervention administered	2 from 80 teachers; 1 from research asst. Intervention administered to 400 students	2/3,3/3		
	10.3. Posttest measures collected		2/4,3/4		
11. Evaluate Implementation fidelity	11.1. Surveys administered, focus groups conducted	1 measure collected from 400 students, 4 from 40 teachers; 1 from research asst. (weekly/biweekly/end of year)	2/4,3/4		
	11.2. Writeups completed, lessons incorporated		4/1		
12. Assess Program Impact	12.1. Intervention administration completed	Study meets WWC standards without reservations, produces Tier 2 Moderate evidence for effectiveness; cost analysis documented	4/3		
	12.2. Cost analysis completed		4/3		
GOAL 4: Sustain Project Impact					
13. Prepare Marketing/Recruitment Materials	13.1. Prepare recruitment deck, report based on findings	Marketing/recruitment materials prepared briefed to schools	4/4		
	13.2. Present to schools		4/4		
14. Recruit Future Sites	14.1. Sites identified	At least 10 schools recruited & committed for mid-phase follow-up grant	4/4		
	14.2. Commitment letters written		4/4		
15. Disseminate Research Findings	15.1. Prepare conference presentations, reports, articles	5+ Conference presentations, journal articles/reports on lessons, findings for diverse audiences completed	4/4		Multiple
16. Develop Business Model	16.1. Decide on terms; draft plan	Business plan developed for sustainment and scale	4/4		
	16.2. Agreed to and signed		4/4		
Notes. S = students; T = teachers; Year/Q = Year/Quarter after contract start; comma = two administrations. [REDACTED] = [REDACTED] [REDACTED] [REDACTED] affiliation is SAIL CoLab; Independent Evaluator [REDACTED] is Penn State; all others are ETS. Measures in Objective 10 are listed in Table 4; those in Objective 11 are listed in Table 5. Objective 15's multiple Responsible indicate multiple publications.					

Research reports will be produced to summarize findings from the pilot and main studies. The pilot study research report will be produced by the development team with feedback and input from the evaluation team (see Section C); the main study research report will be produced independently by the evaluation team. Towards the end of the project period, a report and recruitment deck highlighting the features of the intervention will be prepared to enlist new schools and districts in preparation for a mid-phase grant proposal, and journal articles and conference presentations will be prepared to disseminate impact findings and lessons learned. An important aspect of this work will be a strategy for bringing the products and services developed through this effort to scale. A business plan will be developed jointly with ETS (██████████) and the SAIL CoLab (██████████) that will present a market analysis, an organizational structure, a refined description of products and services, and a funding and financial strategy for doing so.

B.3 Designed to Address Needs of Target Population

The target population is 5th and 6th grade students in rural school districts in Northern Michigan served by Northwest Education Services (North Ed), an intermediate school district (ISD), which is a government agency that assists local school districts in providing education programs and services in the counties where it serves. North Ed has rural locale code 33, indicating a remote, rural location on NCES's CCD website (see Appendix F). North Ed has approximately 1000 teachers serving 22,400 students in grades PreK-12 (see letters of support, Appendix C). Fifth and sixth grade students are targeted because the SSIS CIP SEL intervention is appropriate for first through sixth grade, but unlike younger students, fifth and sixth graders can communicate effectively using text messaging, required for EPCAL administration. This population has significant educational needs and is at risk for educational difficulties (Tieken & Montgomery, 2021). Many of the target schools and students within those target schools can be classified as high need with respect to poverty, teacher shortages, and graduation rates. In North

Ed approximately half of 4th and 8th graders were eligible for the National School Lunch Program, a poverty indicator, and of these, 36% and 48% scored below Basic on NAEP Mathematics, and 49% and 39% below Basic on NAEP Reading, respectively (MISchoolData, 2021). Teacher shortages are a present and growing problem in the two districts targeted for this study: 80% of superintendents reported that teacher recruitment and retention is very or extremely difficult for their districts (Arsen et al., 2021). Many rural districts are underfunded, often significantly (Strange, 2011). Rural students do not go to college at the same rates and urban and suburban students (Koricich et al., 2018) and the gap between rural and urban higher education participation is growing (Marré, 2017).

As an SEL intervention, the EPCAL SSIS CIP is particularly well suited to address educational challenges in rural settings, including obstacles to being on the path for high school graduation and post-secondary participation. Using an instrumental variable difference-in-difference approach, Kautz and Zanoni (2014) showed how an SEL intervention increased graduation rates and college enrollment for high need students. Although SEL interventions promote learning at all levels, they are particularly effective in boosting outcomes for those with greater needs, that is, higher risk, lower achieving students, and students from low-income families, as we document in Section A.1. As a communication tool that works in the context of students interacting with each other and with teachers, and enabling geographically distant partners to work together, EPCAL SSIS CIP has a role to play in allowing diverse participants to find common ground. Importantly, the proposed project is designed to build local capacity to provide, improve, or expand services that address the needs of the target population.

C. Quality of Project Personnel

The proposed project brings together a strong, diverse, experienced team with expertise in the key project components — social-emotional learning skill programming, technology

enhancement, and implementation and impact evaluation of SEL programs — and an extensive history of successful project execution and leadership. Appendix B contains key resumes.

Principal Investigator (PI), [REDACTED] [REDACTED] [REDACTED] has successfully executed numerous large-scale educational projects. He led all questionnaire development and the socioeconomic status project for NCES's National Assessment of Educational Progress (NAEP) in 2006-2010, and questionnaire development for OECD's Program for International Student Assessment (PISA 2012) from 2008 to 2014. He has successfully led, as PI, numerous large scale (over \$1M) grants over the past 20 years, focused on assessing new constructs and skills, including social emotional learning, for the Bill and Melinda Gates Foundation, Intelligence Advanced Research Project Activity (IARPA), Defense Advanced Research Project Agency (DARPA), and Army Research Institute (ARI), and as co-PI, National Science Foundation (NSF).

Project Co-PI Prof. [REDACTED] (SAIL CoLab) will lead intervention refinement and school outreach efforts. Prof. [REDACTED] is the senior developer of the SSIS CIP which serves as the basis for the intervention to be implemented. The team also developed SSIS Rating Scales (SSIS RS), strength-focused, positive assessments of children which have been deployed in thousands of schools and clinics around the world resulting in more than 1,300 published studies. He will oversee development of the intervention for implementation in the target schools. He has successfully implemented the SSIS CIP curriculum in various K-12 settings domestically and internationally, which has resulted in significant positive effects of the SSIS CIP curriculum on SEL skills, achievement, and mental health outcomes based on randomized control trials.

Project Co-PI [REDACTED] [REDACTED] [REDACTED] (ETS) will lead technology enhancement activities. [REDACTED] [REDACTED] is the developer of the ETS Platform for Collaborative Learning and Assessment (EPCAL), which will be the source of the technology enhancement of the SSIS CIP curriculum materials.

■■■■ is currently directing a large-scale ETS internal project dedicated to the development and evaluation of the EPCAL system for numerous computer-supported collaborative learning (CSCL) projects and is co-director of an Army Research Institute supported project on collaborative problem solving.

Project Co-PI, ■■■■ is a learning scientist and an internationally recognized expert on collaborative learning, has an extensive publication record related to learning and collaborative assessment, and has served and is serving as a PI on several NSF and IES grants on collaborative learning and assessment. She will oversee the conduct of the cognitive labs and pilot testing and provide guidance, advice, and direction on all project phases.

Project Co-Investigators, ■■■■ and Data Scientist, ■■■■ will contribute to the refining of the intelligent facilitation features of EPCAL (feedback, classroom management) as well as analysis of student conversations during learning, using process data (NLP and Large Language Model) methods.

The external evaluation team will be led by Prof. ■■■■ (Penn State University). Prof. ■■■■ has had extensive experience in overseeing evaluation of educational interventions in U.S. Department of Education projects, including for the Institute of Educational Sciences (IES). He led evaluation of the SSIS CIP curriculum in prior projects (DiPerna et al., 2015; DiPerna et al., 2018) and is experienced with the curriculum materials and with implementation issues in schools where the curriculum has been evaluated, including cost analyses.

The project staff is diverse in gender (approximately a 50-50 balance), race/ethnicity (Co-PI ■■■■ is African American), and national origin (co-PI ■■■■ co-Investigators ■■■■ and ■■■■ and Project Manager ■■■■ were born outside the U.S.). There are also several key positions that will not be filled until the grant is awarded. These include positions involved in

pilot and main study data collection in the schools, and analysis and reporting positions. We will engage in a recruitment strategy to encourage applications for employment from persons who are members of groups that have traditionally been underrepresented based on race, color, national origin, gender, age, or disability. We will work with the Michigan Works employment agency in Traverse City, and with two, large, area community colleges, Northwestern Michigan College, and Spring Arbor University, both of which have large programs in education and social work.

D. Quality of the Management Plan

Table 3 presents project activities associated with the goals, objectives, and performance measures, completion timeline, and responsible individual. The project purpose is to (a) technologically enhance a proven effective intervention to boost students' SEL, achievement, and engagement (Objectives 1-5), (b) develop teacher support to implement the intervention, with preprogram training and ongoing technical assistance (Objectives 6-8), (c) evaluate main study implementation and impact (Objectives 9-12), and (d) sustain project impact (Objectives 13-16).

This management plan is designed to achieve the objectives of the proposed project on time and within budget, and therefore includes clearly defined responsibilities, timelines, and milestones for accomplishing project tasks. The budget and budget notes are aligned with the management plan. The objectives are specific, measurable, achievable, relevant, and time-bound (SMART), performance measures serve as indicators for how well objectives are met, activities support the measures and indicate the degree to which the grant is on track.

E. Quality of the Project Evaluation

E.1. Project Produces Efficacy Evidence Meeting WWC Standards Without Reservations

The formal evaluation during the final phase of the project utilizes a *Multi-Site Cluster Randomized Trial (CRT)* to evaluate the efficacy of the EPCAL SSIS-CIP SEL in the middle grades in two rural Michigan districts. The planned design is consistent with current What Works

Clearinghouse (WWC) standards and affords the opportunity to evaluate proximal (social behavior), medial (engagement in learning), and distal (academic skills) student outcomes. This early-phase project is designed to produce at least “moderate evidence” (positive finding, RCT, multiple sites, $N > 350$) in anticipation of a subsequent mid-phase grant.

The design allows us to answer important questions related to implementation, acceptability, and use of the EPCAL SSIS-CIP SEL. Our evaluation plan incorporates many of the measures and procedures from prior IES-funded randomized trials of earlier versions of the SSIS CIP; however we will adapt several of these measures — particularly those focused on implementation, feasibility, and social validity (Wollersheim-Shervey et al., 2020)— to reflect the technical enhancements arising from the development phase of the project. Our planned evaluation addresses six primary questions:

At posttest, do students in classrooms implementing the EPCAL SSIS CIP SEL compared to students in non-implementing (business-as-usual) classrooms demonstrate (1) higher rates of prosocial behaviors? (2) lower rates of emotional and behavior concerns? (3) higher rates of academic engagement and motivation? (4) greater academic skill gains? (5) Do prosocial, problem, and/or academic outcomes vary as a function of student or classroom variables (e.g., initial skill level, instructional approach)? (6) Do students and teachers find the EPCAL SSIS CIP SEL to be acceptable, socially valid, and appropriate for use in the middle grades?

E.1.a. Setting and Sample

Sites. We have secured an agreement (Appendix C) with the rural, northern Michigan school intermediate school district, Northwest Education Services (North Ed) (16 public school districts), (NCES Locale: Town: Remote (33)). North Ed has been considering implementation of universal programs to promote positive social behavior. North Ed offers access to over 30 schools with middle grades. Including these sites aligns with the goal of having at least 25% of

EIR funds for awards to applicants serving rural areas (section 4611(c) of the ESEA, as noted in the Federal Register Notice for this program).

Classrooms. Students and teachers in the middle grades (5-6) are nested within classrooms and schools. To ensure sufficient power to detect the hypothesized effect sizes (based on those observed in previous randomized trials with the SSIS CIP SEL [DiPerna et al., 2015, 2016]), a minimum of 80 classrooms, drawn from a minimum of 10 schools will participate in the efficacy trial. (Appendix J provides a description of power analysis assumptions.)

Students. Two cohorts of students (one in **fifth**, one in **sixth** grade) will participate. Each cohort will be comprised of approximately 400 students (40 classrooms per grade \times 10 students with consent to participate in the evaluation data collection per classroom). These students will be randomly assigned (by classroom) to treatment or control conditions within schools (for some schools, assignment may be based on homerooms). By evaluation completion, approximately 800 students will have participated in the study across treatment and control conditions.

Contamination. Implementation of the EPCAL SSIS-CIP SEL requires training as well as access to the secure online platform housing all digital resources. Thus, we expect that contamination will be minimal; as has been the case in prior SSIS CIP efficacy trials. Teachers randomly assigned to the control condition will receive access to the program after completion.

Recruitment and retention. We will incorporate various strategies to facilitate participant recruitment and retention, and provide all curricular materials and financial compensation to both experimental and control teachers. Chromebooks (~800) will be donated to schools of all participants after use. Teachers will be paid on an hourly basis for time devoted to project-related data collection activities. We will provide incentives (e.g., e-gift cards) to thank students for their participation after each round of data collection. Based on our experience with prior CIP

randomized trials, we anticipate low levels of student attrition (<5%) during implementation due to the relatively short duration (12 – 15 weeks) of the intervention. Attrition between experimental and comparison groups will be monitored throughout the duration of the study. If necessary, we will use multiple imputation to replace missing data and perform a sensitivity analysis with and without imputation.

E.1.b. Research Design

The project uses a Multi-Site CRT to test the effectiveness of SSIS-CIP on each of the key outcome variables. For each grade level, classrooms are randomly assigned to experimental conditions (EPCAL SSIS-CIP SEL and business-as-usual control) within schools. This cohort model allows us to achieve our target classroom sample (see power analysis in Appendix J) so we can test the effectiveness of the SSIS-CIP across grade cohorts. In addition, the design allows us to optimize use of project resources and collect a comprehensive set of student and implementation measures on two occasions (pre-, post-) for each cohort.

E.2. Evaluation Provides Performance Feedback and Periodic Progress Assessment

The independent evaluation team (led by [REDACTED]) will be involved with the project during the development phase, engaging in quarterly meetings with the Co-Directors and development team to review progress toward performance objectives. In advance of meetings, the evaluation team will be granted access to products and data generated through pilot testing and usage surveys. These efforts will help inform necessary refinements of the procedures and methods for the formal evaluation to ensure the randomized trial yields relevant, valid, and actionable conclusions regarding the initial efficacy of the EPCAL SSIS CIP.

E.3. Evaluation Plan Articulates Key Project Components, Mediators, and Outcomes

E.3.a. Key Project Components

Outcome Measures. Our student assessment battery utilizes multiple measures, methods,

and sources to assess proximal, medial, and distal outcomes resulting from SSIS-CIP implementation. Measures will be collected twice during the school year: pretest (October) and posttest (February). If the target numbers are not met in a single year this will be repeated in a second. Table 4 outlines key measures (see also Table 3; Appendix J presents measure details).

Table 4. Measures of Proximal, Medial, and Distal Student Outcomes

Measure	Respondent	Skills Assessed	Timing
Proximal			
Social Skills Improvement System Rating Scale (SSIS-RS)	Teachers, Students	Positive Social Behavior	Pretest
Situational Judgment Task (SJT)	Students	Emotional & Behavioral Concerns	Posttest
		Prosocial Skills, Emotional Management/Understanding	Pretest
			Posttest
Medial			
Academic Competence Evaluation Scales (ACES)	Teachers, Students	Engagement	Pretest
		Motivation	Posttest
Distal			
Michigan Student Test of Educational Progress (M-STEP)	Students	English/Language Arts Mathematics	Spring of prior year (pretest) Spring of eval year (posttest)
Student Outcomes Annual Record (SOAR)	Research Assistants	Grade promotion Support services Discipline	End of evaluation year

Teacher Training & Support. Teachers randomly assigned to the implementation condition will participate in formal training facilitated by the lead author of the SSIS CIP SEL ([REDACTED] see Table 3, Objective 6) prior to program implementation. In addition, implementation teachers will be provided with ongoing support (coaching, consultation) throughout the implementation window of the formal evaluation study. As such, we will document the amount of time devoted to SSIS-CIP-related professional development, the content and instructional approaches utilized in formal training, and teacher satisfaction.

Measuring Fidelity of Program Implementation. Multiple measures (Table 5) will be used

to monitor intervention fidelity. (Measure details are presented in Appendix J.)

Table 5. Measures of Intervention Fidelity & Acceptability

Measure	Domains Assessed	Respondent	Administration Schedule
EPCAL SSIS-CIP SEL Fidelity Checklist	Implementation of program materials & activities	Teachers	End of each SSIS-CIP unit
Direct Observation	Implementation of program materials & activities	Research Assistants	Bi-weekly during implementation
Implementation Plans & Logs	Use of Intervention Materials & Activities	Teachers	Weekly during implementation
EPCAL SSIS-CIP SEL Acceptability & Validity Survey	Intervention acceptability & social validity	Teachers, Students	Upon completion of SSIS-CIP
EPCAL SSIS-CIP SEL Follow-up Questionnaire	Acceptability & Planned Future Use	Teachers	End-of-year

E.3.b. Potential Mediators and Moderators of Intervention Effects

Multiple factors could mediate or moderate the effectiveness of the EPCAL SSIS-CIP. Factors with the potential to most significantly impact intervention efficacy (and strategies used to measure or minimize those factors) are described in E.3.a., Measuring Fidelity of Program Implementation. Given the multiple outcome domains identified in this proposal, important additional variables must be considered as potential mediators or moderators of intervention effects. Based on the conceptual model, approaches to learning (e.g., academic motivation and engagement) potentially mediate the effect of intervention or social skills on distal outcomes of academic achievement (i.e., mathematics and reading). Our analysis of mediation effects based on data from the efficacy study suggested that academic motivation potentially mediated the effect of SSIS-CIP on mathematics for older students. As such, we will examine both proximal outcomes of social skills and medial outcomes (motivation, engagement) as mediators between

the intervention and academic achievement outcomes in the proposed study. Moderation analysis from our prior efficacy study suggested that student- or class-level pretest scores, receipt of supplementary service or special education, and student gender could moderate the effect of SSIS-CIP on outcomes. These factors, as well as teacher (e.g., years of teaching experience, beliefs regarding universal programs to promote positive behavior) and classroom (e.g., number of students receiving support services, time devoted to academic instruction, behavior management strategies) variables will be examined as moderators.

E.3.c. Outcomes and Data Analysis

Hierarchical Linear Modeling (HLM; Raudenbush & Bryk, 2002) will be used to evaluate the effects of treatment. We will analyze 3-level HLM models in which students are nested in classrooms and classrooms are nested within schools/sites. Given the modeling complexity attributed to three-level structures, we will test initially the degree to which the schools differ with respect to each of the key outcomes. Should the test of the outcome variance at the school level demonstrate non-significance, then we will simplify the models to two levels. Otherwise, we will explore school level variables that could account for such variance.

At minimum, we will analyze two-level models. We will include predictors at the student level (e.g., gender, race, receipt of services, pretest scores of social and academic skills) and classroom characteristics (e.g., class-level pretest scores, teacher experience and beliefs) at the class level. Treatment efficacy will be tested using dummy codes for experimental conditions at the class level. We will also assess baseline equivalence and control for variables showing significant nonequivalence to mitigate bias. Potential cross-level interaction effects between treatment and student level variables (whether treatment effect varies by pretest scores, gender, receipt of supplementary services or special education) will also be explored by modeling level-1 coefficients as a function of treatment. Potential interaction effects between treatment and

classroom characteristic variables (e.g., class-level pretest scores, teachers' experience and beliefs) also will be tested. HLM analyses will be conducted separately for each of the key outcome measures (proximal, medial, and distal). The main-effects models (without interactions) with relevant outcome measures will provide answers for Evaluation Questions (EQ) 1-4 (see section E.1). The models with interactions involving student or classroom variables will address EQ 5. Descriptive analyses with teacher questionnaire data will address EQ 6.

Because our analyses include social and academic outcomes, potential mediating effects can be detected by examining the pattern of significant effects. If such effects are noted, such as social skills, approaches to learning, classroom management strategies, and quality of implementation we will use structural equation modeling to examine these using multilevel structural equation modeling (MSEM) with Mplus 7 (Muthén & Muthén, 1998-2014).

Finally, we will estimate effect sizes of SSIS-CIP as compared to the control. We will compute effect size as a standardized mean difference by dividing the adjusted (for pretest scores and other covariates) group mean difference by the unadjusted *pooled* within-group standard deviation (SD) of the outcome measure (if SDs are similar for all treatment conditions) or by the *control* group SD (if SDs are very different; Lipsey & Wilson, 2001).

Cost Analysis. An important practical issue for schools considering adoption is implementation costs. The independent evaluation team will complete a Basic Cost Analysis (Levin & McEwan, 2001), documenting costs (personnel, time, training, materials) associated with EPCAL SSIS-CIP SEL implementation at each school, providing potential future adopters a clear picture of the resources needed to implement the program in similar schools.

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