U.S. Department of Education   February 14, 2022
400 Maryland Avenue SW, Room 4160
Washington D.C. 20202

RE: ED Docket No. ED-2022-IES-1

Dear Mr. Soldner

We are writing on behalf of the Learning and Education Academic Research Network (LEARN) Coalition regarding the Institute of Education Sciences (IES) at the Department of Education's (ED's) request for information on "Effective Interventions to Improve Middle School Science Achievement and Mathematics Achievement in Grades 3 through 5 for Students with Disabilities" as published in the Federal Register on January 13. LEARN, a coalition of 41 leading research colleges across the country, advocates for the importance of research on learning and development. As experts in the field, LEARN members provide evidence-based information to guide legislators and policy makers while advocating for an increased Federal investment in education research.

Like IES, LEARN recognizes a gap in research on and interventions for children with learning disabilities in the math and sciences. In fact, LEARN members contributed to the recently published National Academies of Sciences, Engineering and Medicine (NASEM) report titled "Science and Engineering in Preschool through Elementary Grades" which identified that limited research exists on how children with learning disabilities and/or learning differences engage in science and engineering. Despite this challenge, this letter provides valuable examples from the field of effective, evidence-based middle school science and upper elementary mathematics interventions to help IES address this critical issue.

Please note that the examples below are numbered to match the seven questions posed in the RFI.

<u>University of Florida</u>

1. *Name of the Intervention*
   Math Nation (On-Ramp to 6th Grade Math)

2. *Curricular Focus of the Intervention*
   The curricular focus is on upper elementary mathematics concepts and procedures that are important prerequisites for sixth grade mathematics.

3. *Brief Description of the Intervention*
   Math Nation's On-Ramp Tools use adaptive learning technology to diagnose and remediate specific gaps in foundational elementary (On-Ramp to 6th Grade) and pre-algebra concepts (On-Ramp to Algebra 1). Students complete the Start-Up diagnostic assessment and are placed in their own personalized learning path that allows for flexible remediation and acceleration opportunities, available anywhere at any time.

A. *Major Components and Pedagogical Features*
   The major components of the On-Ramp program are the pre-assessments, the Study Expert video tutorials, and the practice items. Students interact with the On-Ramp program via Math Nation's digital platform accessible via web browser or mobile app.

   a. Start-Up Diagnostic Assessment (pre-assessment) to get placed in one of the five domains on the On-Ramp Tool. A total of 121 concepts tested with reports on progress provided over these five content domains.
   b. Students progress through their personalized learning pathway, which presents all concepts using graphics, manipulatives, and other tools.
      i. Each concept has an accompanying Study Expert-led video. Each video is led by a Study Expert who has a different approach to their tutorials. Some provide more in-depth explanations, some less in-depth, and some provide instruction in Spanish. Students have the choice of which Study Expert they want to learn with, and they can change Study Experts at any time. All videos are closed captioned.
      ii. Students go through multiple choice questions. Students must demonstrate mastery of each concept to progress along their pathway. If they correctly answer two questions in a row, they move on. Otherwise, if they miss a question, they are advised to watch a video where a Study Expert goes through a similar exercise. The students are then given another opportunity to demonstrate mastery of the concept.
      iii. Once students have completed all five domains, then they have completed the On-Ramp.

B. *Delivery Modality*
   On-Ramp to 6th Grade Math is delivered via the Math Nation online platform. Students can access this platform via a web browser or mobile app. Teachers can utilize this resource with students in a whole class or small group setting or allow students to work independently with the platform. In addition, teachers have access to all of the items so they can print them out as needed.

C. *Intended Duration and Intensity*
   The intended duration is personalized depending on the students and their individual journey. After taking the Start-Up diagnostic assessment, Student A may land within Domain 1 while Student B may land within Domain 2. Even if all students work at the same pace, since they land on different domains, they will take different amounts of time to finish.

D. *Student Progress Data*
   As students work on their individualized learning pathway, teachers have access to monitor their students' progress. Teachers are able to see, in real time, if their students are progressing, stuck, or regressing and need intervention. Students always have access to their own progress on their On-Ramp dashboard. The On-Ramp tool tracks

when students have a streak of completing three topics in a row as well as their longest streak.
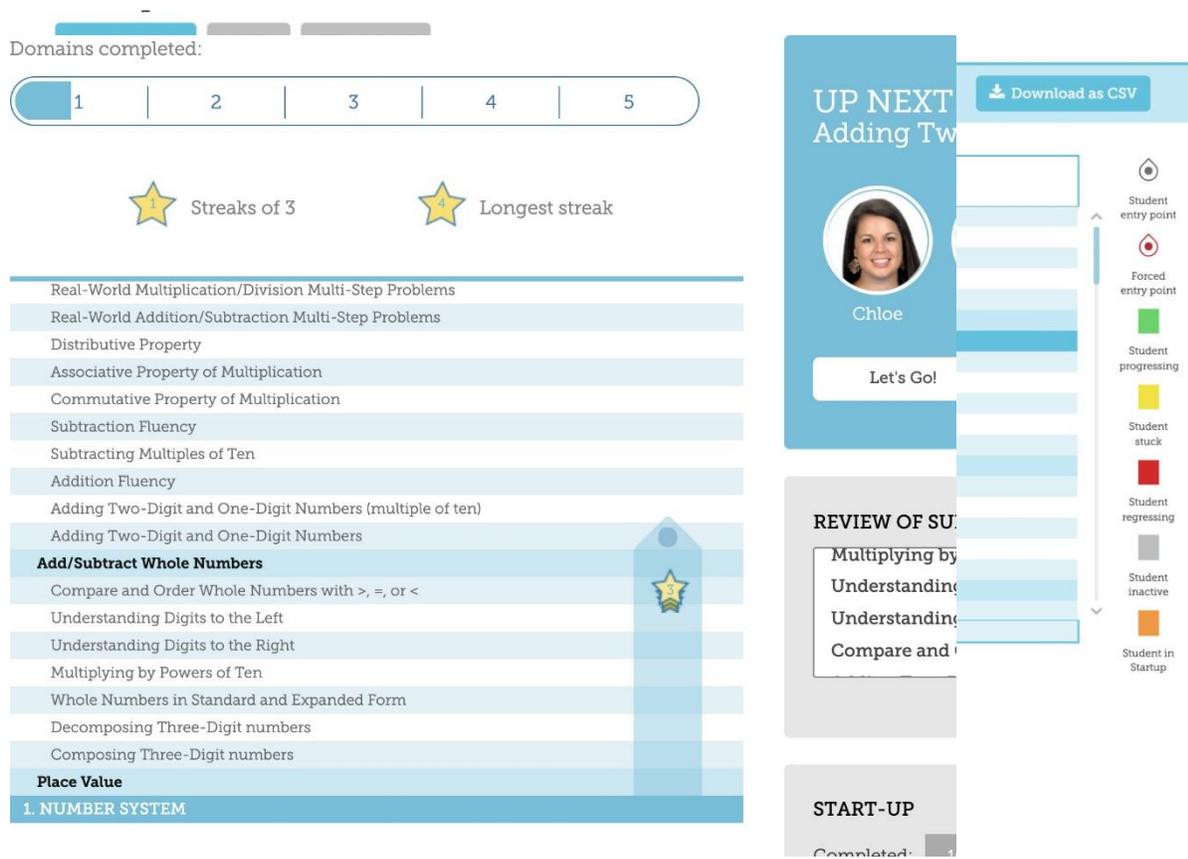
Figure 1. Teacher Dashboard Example

Figure 2. Student Dashboard Examples

4. *The extent to which the intervention, as it is currently available, focuses on improving the proficiency of diverse groups of students.*
   The On-Ramp tool is specifically designed to address any potential gaps in key concepts or procedures necessary for student success in sixth grade mathematics. Thus, the intended audience is students who are performing below grade level and it is also a tool for students with or at risk for developing a disability.

5. *Accessibility for Students with Disabilities*
   Students with disabilities can access Math Nation on the device of their choice and utilize that device's accessibility features. In addition, the exercises are available in digital-to-print form so they can access them without a device if necessary. Students can also watch videos based on their learning needs and choose study experts that cover the same material at different speeds and with different styles so the material can be differentiated based on student needs.

6. *Link to Publicly Available Information about Outcomes*
   - [Website with links to EdReports and Sample Modules](#)
   - [Website linking to multiple studies and outcomes related to Math Nation's impact in Florida](#)
   - [Website for the Virtual Learning Lab and relevant research](#)
   - [An Evaluation of Algebra Nation Usage in South Carolina](#)

7. *Links to Other Relevant Information*
   - [The Math Nation webpage](#)
   - [A video about the Math Nation On-Ramp program](#)
   - [Math Nation Data and Research](#)
   - [Math Nation Purchasing Information](#)

University of Texas at Austin

1. *Name of the Intervention*
   PACT (Promoting Adolescents Comprehension of Text) and specifically, PACT Plus

2. *Curricular Focus of the Intervention*
   PACT text-based discussion set of evidence-based vocabulary and comprehension practices are designed to improve reading comprehension and content knowledge acquisition. The original studies were done in social studies and are more 'unit based'. In PACT Plus, we slightly adapted the intervention so that it could be linked to an individual text and we extended the intervention to science, ELA, (some math classes) and special education/reading classes.

3. *Brief Description of the Intervention*

   We have provided below a summary of the intervention. It has been delivered in person but imagine it could be virtual if needed. In our current project (AIM Coaching; see website below), we are asking that ELA, science, and social studies teachers deliver it once a week and this can be during one class period or spread across a week. In the previous PACT Plus project we asked for twice a week but it was typically only done once or whenever the teachers used text in their lessons.

   <u>Summary of PACT</u>

   PACT is a text-based approach to improving reading comprehension and increasing content knowledge among secondary students in the Tier 1 setting, including for students with disabilities (SWDs). PACT was originally designed for and evaluated in social studies. Findings from three independent RCTs in Tier 1 settings indicate that eighth-grade students in treatment classes consistently demonstrated statistically significantly higher scores in content vocabulary and content knowledge (ES = 0.17 to 0.40), reading comprehension in the content area (ES = 0.29), and broad reading comprehension (ES = 0.20; Vaughn et al., 2013; 2015; 2017).

   During the PACT Plus model demonstration project, PACT was implemented as part of a school-wide Tier 1 literacy model and extended into ELA, science, and social studies classes. Before PACT implementation, we met with school leaders to identify the highest-priority PACT practices and how teachers could best use them in a way that complements current classroom practices. Administrators selected Comprehension Canopy, Essential Words, and Critical Reading of Text from PACT. Teachers were expected to use the practices twice per week.

   There are two primary design features that make the chosen PACT practices particularly appropriate for students with a learning disability (LD) who are served within the Tier 1 setting. First, teachers use explicit instruction (Archer & Hughes, 2011) to teach the skills and provide the information necessary to engage in PACT practices. For example, students are explicitly taught how to cite textual evidence during Critical Reading of Text through the use of modeling (e.g., the teacher uses think-alouds to model how to cite evidence). Second, many opportunities for feedback are built into the PACT practices. Throughout text-based PACT lessons, teachers frequently facilitate peer-mediated practice so that students work with peers to share their thinking, discuss answers to questions, and develop deep understanding of essential words. We provide an overview of the three PACT practices as they were implemented in the PACT Plus project below.

   - Comprehension Canopy: Comprehension Canopy is introduced at the beginning of a text-based lesson to build background knowledge needed to understand the text and to encourage interest in the text. After watching a brief video or engaging in some other short introductory activity (e.g., looking at photos or reading a poem), partners have a short discussion.
   - Essential Words: Teachers introduce two to three high-utility words or concepts that are essential to comprehending the text students will be reading. This practice contains multiple opportunities to learn about each essential word or concept (i.e., student-friendly definition, illustration, sample usage, examples and non-examples, and a turn-and-talk discussion). Teachers review the essential words during Critical Reading of Text to reinforce students' understanding.

- Critical Reading of Text: With the first section of a text, teachers model reading and citing evidence to answer a critical reading question. They also lead a short text-based discussion with students, requiring text evidence to support answers and discussion points. Students then read the remaining sections using a partner reading routine that includes providing their partner with corrective feedback and stopping periodically to discuss answers to critical reading questions. The questions are designed to check comprehension, extend thinking, and encourage discussion among all students. Students are encouraged to cite textual evidence to support their answers and discussion points. After completing the reading, students discuss and write down their answer to a culminating question to demonstrate their understanding of the entire text.

6. *Link to Publicly Available Information about Outcomes*
   [See evidence document](#)

7. *Links to Other Relevant Information*
   - https://www.meadowscenter.org/projects/detail/pact-plus
   - https://www.meadowscenter.org/library/resource/pact-plus-sample-lessons

   We are using the PACT Plus materials and adapted them more for science classes in this project. More info will be coming soon. We have sample lessons if anyone wants them:

   https://aimcoaching.org/

Thank you for your commitment to addressing the current lack of interventions for children with learning disabilities in the math and sciences. If you have questions, please do not hesitate to contact Alex Nock at anock@pennhillgroup.com

Respectfully Submitted,

Camilla P. Benbow, Ed.D.
Co-Chair, Learning and Education Academic Research Network (LEARN)
Patricia and Rodes Hart Dean of Education and Human Development of the Peabody College of Education and Human Development, Vanderbilt University

Glenn E. Good, Ph.D.
Co-Chair, Learning and Education Academic Research Network (LEARN)
Dean of the College of Education, University of Florida

Rick Ginsberg, Ph.D.
Co-Chair, Learning and Education Academic Research Network (LEARN)
Dean of the School of Education, University of Kansas