



### The DoS-MSSE Transformation Process

For over a decade, the Dimensions of Success (DoS) quality framework, observation tool, and feedback system has served as the standard observation tool for observing OST STEM teaching and learning in informal settings, such as museums, summer camps, and afterschool programs. The DoS framework includes an observation tool organized into 12 dimensions of quality across four domains (Figure 1). It is used by certified observers who record field notes about what they see and hear in terms of student and teacher/facilitator interactions during a STEM learning experience. Then, observers score each dimension on a 4-point scale, ranging from 1 (evidence absent) to 4 (compelling evidence).

DoS-OST was initially introduced by Dr. Gil Noam and The PEAR Institute: Partnerships in Education and Resilience at McLean Hospital and Harvard Medical School, and now named the Institute for the Study of Resilience and Youth (ISRY), a teaching and research unit of Harvard that is separate from PEAR, Inc.

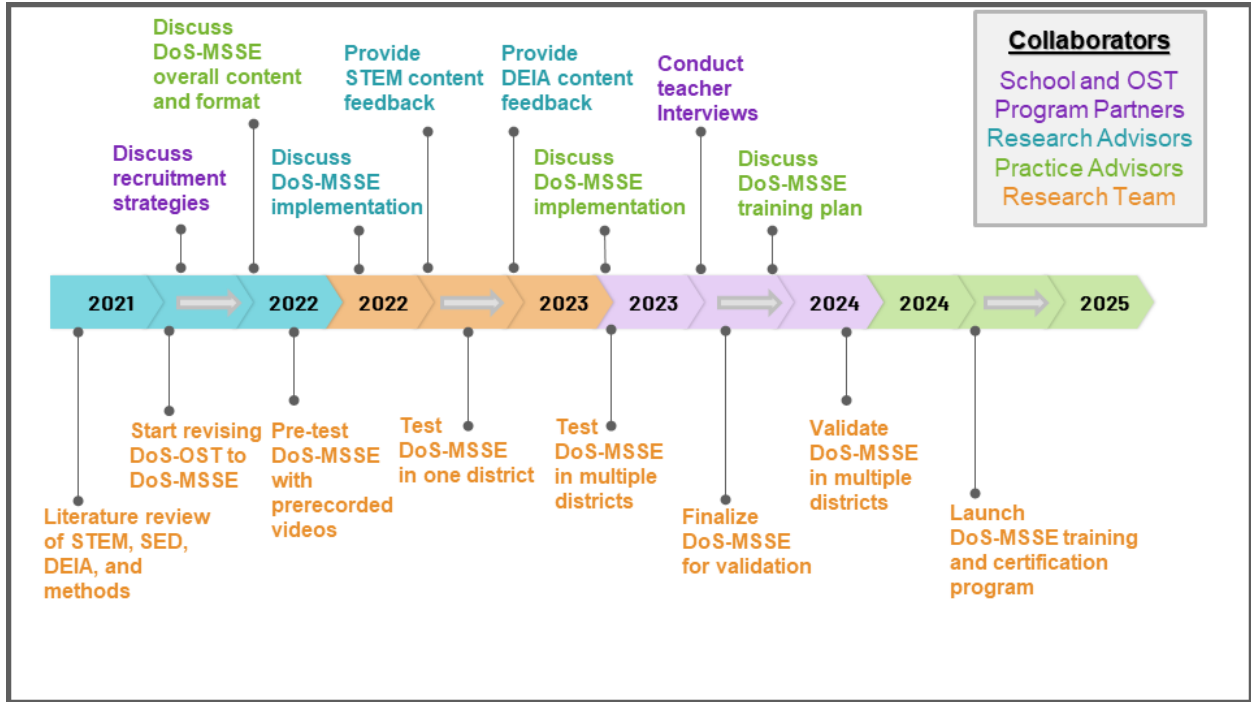
With funding from the National Science Foundation (Award #2101554), the DoS tool is being updated for middle school science and engineering (MSSE) classrooms. This document provides a summary of collaborative activities our research team has engaged in over the first two years of the DoS-MSSE development process (Table 1, Figure 1) and our plans for future work in the next two years (Table 2).

**Table 1.** *DoS-MSSE Collaborative Partners and Roles.*

Group	Description of Members	Role
Consultants	STEM education and DEIA research and practice expertise, both in school and OST ( $n=3$ )	Provide content feedback on the DoS-MSSE tool.
Research Advisory Board	STEM education and DEIA research expertise, both in school and OST ( $n=7$ )	Review the DoS-MSSE and advise the research team on the design of the project.
Practice Advisory Group	Middle school science teachers and instructional coaches ( $n=5$ )	Review the DoS-MSSE and advise the research team on the implementation considerations for the tool from the perspective of future tool users.
Teacher Participants	Middle school science teachers ( $n=4$ )	Receive feedback using the DoS-MSSE tool and provide feedback about their experience with the process.
School and OST Stakeholders	Superintendents, principals, STE(M) coordinators, instructional coaches, OST program leaders ( $n=45$ )	Share experiences, perspectives, and desires for quality improvement tools in middle school STEM classrooms through recruitment conversations.

*Note.* DEIA = diversity, equity, inclusion, and access; DoS-MSSE = Dimensions of Success for Middle School Science and Engineering; OST = out-of-school-time; STEM = science, technology, engineering, and math.

**Figure 2.** Collaborative Activities to Refine and Revise the DoS-MSSE.



*Note.* The activities listed in Figure 2 are the major activities carried out by partners, but not exhaustive summary as all collaborators were involved in discussion of all content and implementation areas of interest. DEIA = diversity, equity, inclusion, and access; DoS-MSSE = Dimensions of Success for Middle School Science and Engineering; SED = social-emotional development; STEM = science, technology, engineering, and math.

DoS is now entering an exciting period of transformation. As the reach and impact of the DoS tool increased in OST STEM programs, we have received requests from educators, system-builders, funders, and policymakers to expand the tool into formal K-12 settings and align it with current educational standards and advancements in research and practice. We summarize our plans for future work in Table 2.

As we develop the DoS-MSSE tool and training program, we are seeking feedback from all stakeholders. We want to ensure that DoS' indicators of higher quality STEM teaching/learning are accurate and meaningful for all users. We encourage you to share your questions and thoughts on [ISRY's website](#).

**Table 2. DoS-MSSE Future Work.**

Phase	Goal	Tasks
Phase III (May 2023- April 2024)	Validation Study	<ul style="list-style-type: none"> <li>Conduct observations in schools using the finalized tool and collect data using self-report surveys (n=180 observations; 90 teachers/classrooms).</li> <li>Analyze data from observations and self-report surveys.</li> <li>Refine the tool, training process, and certification requirements for the finalized version of DoS-MSSE.</li> </ul>
Phase IV (May 2024- April 2025)	Dissemination and Training	<ul style="list-style-type: none"> <li>Conclude analysis of data and disseminate findings and the new DoS-MSSE tool with teachers, evaluators, researchers, policymakers, and system-builders.</li> <li>Revise and implement the DoS-MSSE training and certification program with teachers (n=500) from schools through partnerships and collaboration.</li> <li>Develop training specific to certain users of the DoS- MSSE tool, such as system-builders that aim to study the quality of STEM learning experiences across schools, OST programming, or other informal settings.</li> </ul>