

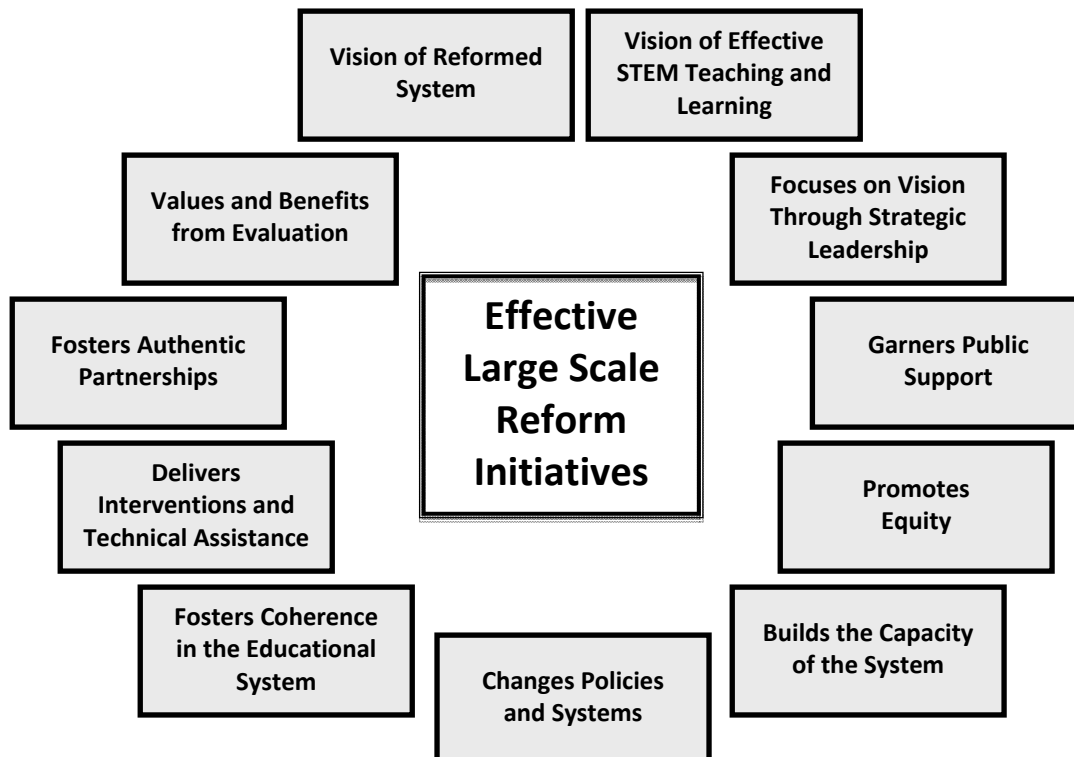
Washington State STEM Initiative

The mission of the Washington State STEM Initiative (the Initiative) is to catalyze innovations in the states K-12 education system, transform the teaching profession, and dramatically increase the number of Washington state students graduating college-ready and the number succeeding in STEM post-secondary degree programs. The Initiative emerges from a long history of reform efforts within the state and against the backdrop of similar efforts nationwide. Three guiding questions related to this context are critical to the initial phases of program design:

1. What lessons can be learned from prior large scale reform efforts to inform the design of the Initiative and to define criteria for it key strategies, programs, and actions?
2. How can these criteria be applied to existing Washington State programs to identify strengths to leverage and surface areas to target to increase effectiveness and accelerate impact?
3. How can these criteria be used to inform the development of the Initiative’s key strategies and associated programs and activities?

Large Scale Reform Initiatives: Insights from Research and Practice

Large scale reform initiatives usually involve several organizational partners who work together to bring about an educational reform in a community, region, or state. The focus of these initiatives is on enhancing the environment that supports effective teaching and student learning. These initiatives leverage resources, individual programs and services, expertise, policy, and organizational structures to improve teaching and learning. The outcomes include a shared vision of effective teaching and learning - as well as a shared understanding of the required environmental supports to achieve that vision - improvement in support programs, increased coherence and coordination among components of the educational system, and fundamental changes in individual functions of the educational system. Effective initiatives are designed and carried out by using what we know from research and experience. They use this common knowledge base while also adapting to their host environments and conditions in innovative and thoughtful ways. A summary of the formal and informal literature, research, and expert groups generated these indicators of quality large-scale reform programs.



Vision of the Reformed System

All partners in the initiative have a shared vision of the reformed system that is explicit and transparent. This vision targets learning and teaching, as opposed to changes or conditions in organizations, policies or programs which are means to the end. The initiative must not only share this vision of a reformed system, but must agree on how best to get there. Using the best evidence available, the partners in the initiative select strategies that will work most effectively to achieve the goals. The goals and activities within the program portfolio are all connected through the shared vision for reform. Expectations for student and teacher outcomes are high and consistent with research. Resources and support are provided to ensure expectations can be met; partners are accountable to making progress toward the goals and outcomes. Ongoing assessment and evaluation drives continuous improvement and learning.

Vision of STEM Teaching and Learning

The initiative is driven by a vision for effective science and mathematics teaching and learning at all grade levels that is founded on research and expert experience. This vision maintains that classroom instruction focuses on students' deep understanding of major science and mathematics concepts, and development of skills and habits of mind. Instruction focuses on fewer concepts to allow for greater depth of learning and emphasizes that both knowledge and skills are important outcomes of mathematics and science instruction. Classrooms model assessment that measures important learning outcomes and is done both in the course of instruction to monitor student understanding, and at the end to determine an indication of the extent to which learning has occurred.

Values and Benefits from Evaluation

The initiative takes evaluation seriously and builds it into the program design. Evaluation performs three functions: (1) it monitors that key program activities occur as planned or depart from the plan with good reason; (2) it assess how well the program is operating during the program and provides information to reflect on performance and make appropriate changes; and (3) it investigates and determines the outcomes of the program on a regular basis, not just at its conclusion. The design and operations of the initiative change over time on the basis of evaluation information. The evaluation plan is driven by the initiative's vision and goals compares performance against benchmarks and expected outcomes as a means to determine effectiveness.

Focuses on the Vision through Strategic Leadership

The initiative has a clear leadership structure, and lines for reporting and communication are clear. Leaders ensure that a collegial atmosphere prevails in an environment in which professional exchange is encouraged, and mechanisms are created to make that happen. The initiative has a clear set of goals that are understandable by participants, program staff, sponsors, and communities. Activities can be readily traced to one or more of these goals. Leaders within the initiative ensure that different individuals from throughout the community have input into design and operations and are kept informed of progress toward the intended outcomes.

Fosters Authentic Partnerships

A partnership among organizations is central to the design and intention of the initiative to improve science and mathematics education, whether in schools, districts, higher education, or the broader community. The initiative is inclusive: it involves the major stakeholders representing key groups that are concerned with STEM teaching and learning in both K12 and higher education settings. There is regular communication and a prevalent feeling of trust and positive working relationships. Individual partners understand their roles and responsibilities which are often outlined in a strategic plan. The plan defines ways to leverage resources among partners; this is a real leveraging of resources, not just in-kind contributions that are already available to support the long term outcomes of the initiative. The partners recognize that some risk is involved in the effort and that its success is likely to necessitate changes in individual partner organizations.

Garners Public Support

The initiative undertakes specific communication and engagement strategies to involve supporters, as well non-participating or even opposing stakeholder groups. Leaders of the initiative consider the perspectives of these various individuals or groups. Communication plans articulate how the reform effort will benefit from the participation of these different stakeholders, but also how the stakeholders themselves will benefit – establishing a win-win proposition. These strategies are proactive and on going throughout the effort, not just concentrated near the beginning or at the end of the effort.

Delivers Interventions and Technical Assistance

Math and science reform efforts provide interventions to drive improvements in K12 settings, often targeting increases in the knowledge and skills of participating teachers, students, administrators, counselors and parents. Systemic reform efforts also address interventions in higher education that focus on improving undergraduate and graduate mathematics and science courses, as well as improving the quality of the teacher and administrator preparation programs. The initiative includes multiple delivery interventions that often include professional development, consultation, instructional materials, provision of resources, changes in school structure and governance, and fundamental values and beliefs. Technical assistance based on formative evaluation data ensures high quality implementation. Interventions begin as small scale pilots to establish an evidence base to determine which are worth the effort and expense of going to scale.

Promotes Equity

The initiative focuses on the success for each and every learner. It has clear, high, and realistic expectations for all participants, regardless of differences, in an inclusive and supporting environment. Interventions and strategies target populations with the greatest need. The Initiative actively targets students who are historically and presently underserved by existing, traditional education environments to maximize their opportunities to benefit from reform efforts. The initiative also recruits participants for specific activities and roles that represent populations traditionally underserved in mathematics and science.

Fosters Coherence in the Educational System

The initiative seeks to change curricula, materials, instructional practices, and assessment to align with each other, state, and national standards – all consistent with the vision of the overall program. The initiative pursues coherence in program design, but also in communicating key messages within and beyond the partners, in allocating resources to programs consistent with reform goals, and in establishing and pursuing a targeted policy agenda.

Builds the Capacity of the System

Leaders of the initiative understand and act on the tenets of large-scale change. Sustained attention is given to institutionalizing changes from the very beginning. The initiative focuses on broad scale leadership development and skills, collaboration, change management, and system concepts. Networking among partners and other reform efforts is active in the pursuit of new knowledge and increased capacity. Attention is given to building and disseminating knowledge throughout the effort, not simply at the end. The objective is not simply “scaling up” particular reform efforts to reach a larger portion of the target population. Rather the intent from the start is “going to scale” by changing the system so that the reform vision becomes part of the core mission of all partners in the effort. In this way, the reform aims to fundamentally alter the organization, functioning, priorities, commitments, and incentives within the education system.

Changes Policies and Systems

The initiative has a focused policy agenda targeting those policies that need to change to support the shared vision of the initiative. Policies at the school level might include how schools make decisions, the structure of the school day, allocations of resources, new teacher support, approaches to professional development, assessment practices. Teacher preparation, licensure, and evaluation are also common targets for policy at the state level.

Key References

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