MINNESOTA COMPASS

Boston Scientific

STEM Advisory Committee Meeting 2: Data needs

Following is a summary of potential data needs based on recommendations of the Minnesota Compass/Boston Scientific STEM Advisory Committee in spring 2013. A complete list of indicators recommended by the committee, and related data sources, is provided in the accompanying "Why/WhyNot" document. The table below summarizes areas of expressed interest for which an existing statewide data source was not identified. This list may serve as a reference to those considering revising or developing statewide data-collection instruments. Needs identified here reflect interests expressed by the STEM Advisory Committee.

Ideally, data in the following areas would be available on a statewide basis, at multiple time points along the continuum, and for demographic and geographic subgroups. In some cases, related data may currently be available, but is not specific to STEM or related to only one aspect of STEM (e.g., science) and not available for detailed subgroups/regions.

Data need	Description	Points on the continuum
Drop-off points	Consistent measures at multiple points along the STEM continuum would facilitate a longitudinal perspective of when and why individuals drop-off the continuum. For example, a consistent question related to STEM interest could be asked of students at multiple grade levels.	K-12
Informal education	In general, more data is needed to understand the availability and impact of informal STEM education opportunities.	K-12
Interest	More detailed information is needed on students' interests in STEM, and at multiple points along the continuum.	K-12
STEM integration	Data that tracks progress on the movement toward STEM integration (e.g., teacher understanding/comfort with STEM integration, professional development in STEM integration, availability of integrated STEM opportunities for students, student understanding of the integration of STEM disciplines).	K-12
Career education/ exploration	Data on students' exposure to and exploration of STEM career pathways.	Middle school High school
OST program opportunities	Data on available out-of-school time (OST) programs by region, age/population group served, area of STEM, and types of learning opportunities (e.g., hands-on, experiential, youth development programming). These data are important to connect students/families to existing resources and identify resource gaps. The Sprockets database currently in place for St. Paul provides data on the OST programs available in that area.	PreK-12
OST participation	Data on participation in OST activities/programs specific to STEM by region, age/population group served, area of STEM, and types of learning opportunities. These data are important to understanding the extent of involvement in STEM experiences along the continuum, variations by population group/region, drop-off points, and the impact of OST programming.	PreK-12
OST impact	Beyond program-specific data, a broader understanding of the impact of STEM OST programming has been noted as an area of data need. This may be facilitated by the development of OST databases (e.g., Sprockets) as well as support for more uniform use of consistent assessment tools as appropriate across programs.	PreK-12

Data need	Description	Points on the continuum
In-school coursework opportunities	Data on availability of specific STEM courses, including at the school level, would be helpful in understanding opportunities and opportunities gaps within formal education.	Middle school High school
Experiential learning	Data on availability of/participation in experiential learning opportunities in STEM specifically.	PreK-12
Personal connections to STEM	Data on students' perceptions of having personal connections to STEM or participation in activities that can cultivate personal connections.	K-12
Mentoring/role models	Data on student access to mentoring/role models specifically in STEM.	K-12
Transfer of skills	Data on students' ability to transfer skills from one context to another.	K-12
How skills come together	Data on how students' various skills in STEM come together. May be a consideration in assessments used both in formal and informal education settings.	K-12
Workplace exposure	Data on students' exposure to STEM workplaces.	Middle school High school
Early STEM exploration	Data on STEM exploration in the early years, in addition to later STEM career exploration.	PreK Elementary
Teacher preparation	Additional data useful in ascertaining teachers' backgrounds and skills in teaching STEM. Committee recommendations included teacher training, educational background, length of time in their position, professional development areas, and effectiveness at inspiring students in STEM. The importance of understanding regional differences in teacher preparation was noted. The NAEP and TIMSS assessments include questions related to teacher preparation and quality which may be useful in considering data we may want to gather for more detailed geographies and subgroups in Minnesota. Due to the variety of indicators suggested in this area, it may be useful to consider the merits of collecting any additional data points through existing statewide data-collection instruments.	K-12
Skills important to employers or that predict success in STEM degrees/fields	Data on skills important to 21st Century employers and which may be predictors of success in STEM degree programs and fields. In some cases, these skills may be STEM-specific (e.g., ability to design and conduct experiments), and in others they may be more general (e.g., leadership, teamwork). Existing research and guidelines related to important indicators of success in STEM can be consulted in considering potential data measures in this area (e.g., Academic Pathways Study of engineering education, student outcomes required by the Engineering Accreditation Commission of ABET for students in engineering degree programs).	High school College, career & job training
Innovation	Data on academic and employment cultures supportive of innovation.	College, career & job training
STEM funding by area	Data on STEM funding by area of STEM (i.e., S, T, E, M).	K-12

Note: *Potential data needs identified here reflect interests expressed by the STEM Advisory Committee in spring 2013.*

Wilder Research, *May 14, 2013*