

Governor's Task Force on K-12 Science, Technology, Engineering and Math (STEM) Education

December 10, 2015

DRAFT MINUTES

Location: Library Commons, Southern New Hampshire University 9 -11 a m

Present: Ross Gittell, chairman; Susan D'Agostino, Buck Beaudoin, Brian Blake, Barbara Couch (by phone), Chris Dodge, Joe Helble (by phone), Sally Jean, Eric Feldborg, Lauren Provost, Leslie McRobie, Vasu Vasudevan and Annie Wallace

Others Present: Brittany Weaver, Governor Hassan's Policy Advisor; Tom Hassan, First Gentleman and retired principal Phillips Exeter Academy; Tabitha Dunn; Karen Erickson, Dean of Arts and Sciences, SNHU; Michael Radice, ChartaCloud Technologies; Mike Weinstein, STEM, SNHU; Stephanie Fournier, NH Fisher Cats.

- I. Call to Order
Chairman Gittell opened the meeting at 9 am, welcoming the Task Force and members of the public who were present. He asked all present to introduce themselves.
- II. Approval of September 29, 2015 meeting minutes. Buck Beaudoin made a motion to accept the minutes; Annie Wallace seconded. The minutes were approved unanimously.
- III. Review of Task Force working group plans Dec. 2015-June 2016. Each working group: Foundations in STEM, Inspiring Students, Empowering Teachers and Communications/Engagement presented their plans (See Addendum A for plans).

Foundations of STEM

1. Next Generation Science Standards:

- Midsummer 2016 NHDoe to have a set of science standards to NH Board of Education for review.
- NHDoe science leadership (steering Committee) council: Task Force member Sally Jean is participating supports full adoption of NGSS-based standards and will report back to Task Force
- STEM TF should participate in outreach to support adoption of new science standards

2. Coding:

- Important to look out of state for implementation models of coding for potential adoption in NH schools (27+ states require coding in the curriculum)
- Can tech-ed courses be reworked in Middle School to be computer science/coding courses?

- School counselors need to be educated about these issues, as well as College/University admissions counselors.
- Coding as math requirement: to Annie Wallace's point, is there a role for technology teachers to learn to teach coding as math - not just math teachers teaching coding as math.
- Investigate college admissions in NH recognizing coding as partial fulfillment of math requirements - not simply as an elective.
- How can coding be included/taught across the curriculum (in elementary and middle school)?

3. Alternative Math Pathways

- Key focus: need communications "outreach" to dispel the "myth" that calculus is the only path to college majors in STEM areas, especially engineering
- Can "capstone" courses be used to include alternative math pathways, i.e. capstone course focusing on linear algebra? Looking at options to introduce alternative math pathways into crowded schedules.

Next Steps:

- Working Group will schedule January meeting to review goals of Dec 10 report and assign individual leadership for each item
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Inspiring Students

1. Challenges, competitions and capstones.

- In 2016 working group will focus on competitions. Chairman Gittell suggested that there might be an effort to identify STEM gaps in competitions after reviewing NH Charitable Foundation data, and create a matrix which identifies regional and skills gaps.
 - Bob Hallowell is working on this.
- These may be good opportunities to enlist the support of the business community to support for competitions and suggest skill gaps to be addressed.
- **Next Steps:** Begin review of data in January and review with working group.

2. STEM academies:

- NH Math and Science Academy feasibility report is underway, and Susan D'Agostino suggested that academy will need to be tied to a location so it becomes more than an abstract concept. She reported that the academy might be embedded in a university, similar to Boston University academy
- **Next Steps:** Meetings and calls to continue research are scheduled for January.

3. CTE Pathways:

- All levels of education K-higher education need to be involved in conversations.
- There are NH models for CTE collaborations such as Seacoast Computer programming, Medtronic's/Manchester Community College program, etc.
- Challenge and focus: how to expand and/or scale up model programs?
- **Next Steps:** Schedule call in January to plan for creation of state-wide advisory boards in key STEM areas such as IT, engineering, advanced manufacturing and healthcare to provide guidance to secondary and post-secondary education for the design and implementation of viable curriculum as well as providing insights into market and labor demand and programmatic needs.

4. Career Pathways / Personal Learning Plans

- Although there are numerous states using PLPs, there is not much outcomes-based data. Are they useful in helping students choose and prepare for satisfying careers?
- This subgroup will assemble a group of advisors from education and business to provide guidance on the challenges and constraints of PLPs.
- The subgroup wants to move forward with a pilot in 2016. One school has expressed interest.
- **Next Steps:** Group of advisors to meet in January.

5. Girls in STEM

- A major focus is how to support girls early in their pathways, elementary and middle school?
- This sub-group plans to continue close collaboration with NH High Tech Council's Women/Girls in STEM ambassadors and mentoring program.
- This group plans to collaborate with higher education to further research
- **Next Steps:** Form an advisory leadership team (collaborating with NH High Tech Council: Women/Girls in STEM Initiative) to support research and reporting on key gender pathways.

Empowering Teachers

- A key challenge is finding time to teach STEM subjects in already crowded teaching schedule, and how to enhance teacher's abilities to teach STEM subjects.
- STEM learning in the Classroom: what constitutes a STEM activity/ STEM teaching? Integrated or separate topics? What is good material and what is lacking?
- Priority: Teachers are asking for a coherent definition of STEM teaching; working group will focus on this issue.
- Teacher Professional Development: The group plans to work with NH DoE on micro-credentialing and enhancing STEM professional development opportunities. The need for professional development is acute at elementary level, especially for teachers credentialed as general education specialists. They are often asked to teach math and science without adequate background.
- T. Hassan asked if the focus is on mandating professional development or encouraging it? Where does NH stand on this issue?
- Consensus of working group: if opportunities are presented to teachers for professional development, they will take advantage of it. They want to learn.
- Sally Jean said that although Keene State is recognized as one of the best producers of science teachers, this is on the downturn.
- **Next Steps:** Initiate data collection and conversations to build consensus on definition of STEM teaching.

Communications and Engagement

- Buck Beaudoin presented conceptual mock-up of website home page to highlight key audiences and topics.
- Many companies are now offering STEM educational products. Working group recommends that these products be curated by NHDoE to ensure they meet quality measures (yet to be developed).

- **Next Steps:** Working group will review web development software in January, aiming to produce phase I version by early 2016. Brittany Weaver reported that any major expenditures for web development will require an RFP.

IV. Follow up to presentations

- Chairman Gittell will lead review of plans to identify (1) areas of overlap and shared priorities, and working group collaborations, (2) who should be “at the table” to provide input and help to the Task Force and its working groups.

V. Task Force announcements:

- MIT Teaching & Learning Lab visit: Scheduled for Dec. 18 at MIT 11-1 pm/
- NHCUC Meeting: Dec. 15 1-2:30pm at 3 Barrell Court, Concord, NH
- Proposed meeting schedule for 2016: Every six weeks as schedules permit. A poll will be distributed.

IV. Public input (2-3 minutes each speaker)

- Stephanie Fournier, Director of Hospitality & Special Events with the New Hampshire Fisher Cats announced that on May 11, 2016, 9-10 a.m., the Fisher Cats will host a STEAM interactive session for high school students. She issued a special invitation to Task Force members. More information is available by contacting jraizes@nhfishercats.com
- Representative, Michael Radice, ChartCloud Technologies: introduced “NAO” a STEM robot with humanoid shape and able to respond to spoken commands. NAO is currently used in a variety of settings including healthcare and education. He also noted that the company has developed a STEMBotics curriculum. More information at www.chartcloud.com
- Michele Munson comments: STEM NH will conduct a survey on STEM and Next Generation Science Standards; suggested the National Alliance for Program in Equity-STEM Equity Pipeline as a source for effective training on STEM issues; and National Girls Collaborative Project as a source for Girls in STEM Task Force activities. She announced that Project Lead the Way will hold a New England Conference January 8. More information is available at <https://www.pltw.org/get-involved/events/maine-new-hampshire-and-vermont-pltw-state-conference>