

# **Governor's Task Force on Science, Technology, Engineering and Math Education (STEM)**

**Tuesday, May 27, 2014**

## **Dyn Corporation, Manchester, NH**

**Task Force Members in Attendance:** Ross Gittell, Chairman; Brian Blake; Barbara Couch; Joyce Craig; Susan D'Agostino; Caroline Herold; Robert Hollowell; Todd Lamarque; Paul Leather; Palligarnai Vasudevan.

**Unable to Attend:** Mary Kate Hartwell; Joseph Helble<sup>1</sup>; Jeremy Hitchcock and Dean Kamen;

**Others present:** Cynthia Dunlap, Professional Development Chair, and Kathleen McClaskey, Advocacy Chair, NH Society for Teaching in Education; Zachary Fowler, Technology Educator, Ross A. Gurgio MS School

### **I. Call to order**

Chairman Gittell opened the meeting at 4:00 pm by welcoming members of the Task Force and the public who were present at the meeting. He asked all present to introduce themselves.

### **II. Approval of May 6, 2014 minutes**

Barbara Couch made a motion to accept the minutes. The minutes were approved unanimously.

### **III. Reports from STEM Task Force A, B and C**

Chairman Gittell asked the Task Force Teams A, B & C to report on their work. Each team report was followed by feedback from the entire Task Force. Team handouts are attached.

#### **Team A: How do we get students excited?**

**1. Overview:** Develop a K-12 NH STEM pathways model ranking developmentally appropriate opportunities to build excitement and understanding of STEM related subjects, with a focus on universal access through school-based, statewide programs such as STEM competitions, daily curriculum, STEM Career and Technical Education (CTE) programs and magnet high schools.

#### **2. Major Ideas:**

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<sup>1</sup> Attempted to attend via conference call line, but technical difficulties prevented connection

- a. Anchor STEM exposure in school-based, statewide competitions to expose students at all grade levels to STEM related projects, as well as build school and cohort spirit around experience (similar to K-12 sports model)
- b. Consider magnet high school for students who seek STEM careers
- c. Build out the model for STEM pathways (see page 2 Team A handout)

**3. Feedback from Task Force:**

Unanimous support for competitions, but asked for more clarity on when (e.g. in what grade levels) to invest in competitions. Team A was asked to develop this idea more fully. Suggested that pathways for elementary students to experience STEM be given more emphasis (see page 3 Team A handout). Consider STEM laureate for NH (similar to Poet Laureate) and STEM mentorship programs

**Team B: How do we empower educators?**

**1. Overview:** Resource and develop K-8 “laddered” STEM education that involves developmentally appropriate “steps” in the STEM fields with applied field-based and in-class projects and curriculum that engages K-8 faculty with students and with the support and engagement by industry and STEM faculty expertise at NH universities of colleges

**2. Major Ideas:**

- a. Make science part of everyday for every student in K-8
- b. Provide teachers with science kits/resources (especially in K-6) to empower teachers not versed in science topics
- c. Create STEM professional development hubs which could be co-located in existing regional facilities of the Department of Education’s centers for professional development and technology.<sup>2</sup> Consider stipends and awards for STEM teaching (see extensive list on attached Team B handout)
- d. Provide professional development to K-12 teachers so that they might be able to teach STEM in a laddered way similar to social science pathway (which scaffolds study from local government to state and Federal government).
- e. Ask the Governor to become the champion for STEM education, in order to help educate students, parents and other stakeholders as to the importance of STEM careers.

**3. Feedback from Task Force:**

Strongly supported the idea that sciences should be part of everyday learning, especially in K-8. Since there is insufficient time in the school day to teach an extended STEM curriculum, consider ways to integrate STEM work into other areas such as math lesson, or to create STEM thematic areas such as studies of water, environment, etc., which can incorporate math and science lessons. Task Force suggested Team B firm up their suggestions regarding a science curriculum modeled on current social science curricula.

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<sup>2</sup> Local Educational Support Network hosted by the NH Department of Education

## **Team C: What STEM-related standards/requirements should be in place to prepare in K-12 for a technology-driven economy?**

### **1. Overview**

Review existing K-12 math and science standards with a focus on integrated STEM studies and teacher preparation sufficient to meet requirements for 21<sup>st</sup> careers and skillsets.

### **2. Major Ideas**

a. Examine math and science requirements to ensure they are satisfying what is important and useful to both STEM and non-STEM majors. Suggested that statistics and data analysis have practical applications in most careers today; and coding provides problem-solving and foundations/logical thinking for math, science and other STEM study. New Hampshire standards do not address role of hands-on experiential learning necessary for STEM subjects

b. In light of new requirements for 21<sup>st</sup> century careers, review adequacy of NH science standards (created in 2006); review standards such as the *Next Generation Science Standards* (which are the basis for *Smarter Balanced* K-12 assessments in New Hampshire slated to replace NECAP tests in spring 2015).

c. Develop recommendations for STEM teaching qualifications to ensure that teachers are adequately prepared.

### **2. Feedback from Task Force:**

Consensus on the need to examine math and science standards for relevance to 21<sup>st</sup> century economy; supported the investigation of re-examining how essential calculus is prior to college as well as determining what math requirements would be beneficial. Task Force was interested in learning more about Team C's approach to statistical and data analysis studies as well as a requirement for writing an app as a result of coding courses. Suggested looking at other states including recent changes in Massachusetts science and math standards.

## **IV. Other Discussion:**

1. Timeline for Task Force work presented (see attached)
2. Website for Task Force resources and public feedback is in the final stages for Memorandum of Understanding (MOU) approval. Website is provided free of charge courtesy of Community College System of New Hampshire (CCSNH). However, a MOU between Governor's Office, CCSNH and Governor's Task Force on STEM Education is required. Mary Kate Hartwell, Task Force member, will sign on behalf of Task Force.

## **V. Public Feedback:**

Zachary Fowler, Technology Education instructor, Ross A. Lurgio MS, School District 25, Bedford, NH, spoke on behalf of the New Hampshire Technology Education Association and the New England Association of Technology Teachers. Mr. Fowler noted that Technology

and Engineering Education teachers in New Hampshire, located in K-12 schools, provide students with hands-on activities and real world learning in STEM. These activities both supplement and enhance classroom learning. He expressed the hope that technology education instructors be included in the Task Force's recommendations to support STEM teaching

Dr. Ali Rafieymehr, Dean, Dyn University recommended that the Task Force Team A include afterschool programs in its recommendations for engaging students. AS an example, he cited Technology & Innovation Academy at SEE <http://steamaheadnh.com/> and STEAM Ahead <http://www.see-sciencecenter.org/technology-academy/default.aspx> (a pilot program to integrate computer science into high schools).

**VI. Schedule of Meetings:**

1. M. Parker will contact members to set up next meeting for the full Task Force and for individual Teams.
2. Brian Blake made a motion to adjourn the meeting. Meeting was adjourned at 6:00 pm