Developing Large-Scale Effective Teacher Learning Communities at NSTA

Presented by:
Dr. Al Byers
Flavio Mendez

August 22, 2012
The US Department of Education has declared August 2012 **Connected Educator Month (CEM)**, aimed at broadening and deepening educator participation in online communities and networks while providing opportunities for education leaders to work together to move the field forward.

See upcoming activities at the CEM website:

http://connectededucators.org/cem
Focus of Session

• Brief Review of Existing PD Landscape

• Overview of Learning Center content, tools, community integration, and recognition/reward system

• Review of Impact Studies and Research
The US Professional Development Landscape

What we know—Local Systemic Change K-8 Evaluation: (75,000 data points -10 yr NSF Longitudinal study)

Teachers of Science with *less* than 16 hours of PD in last year:

- What % at K-4 level? 76%
- What % at 5-8 level? 57%
- What % at 9-12 level? 32%

Research calls for 50-80 hours/year to effect a change in teacher practice.

2010 National Education Technology Plan

Through online learning systems, teachers may enhance their learning through blending the best of onsite PD with online PD that provides immediacy, convenience, self-direction, and collaboration with other colleagues and experts via professional learning communities.

For teachers to effectively facilitate using interactive resources, learning systems, and connectedness to online communities, teachers need to experience it firsthand—as part of their own learning and professional development.

(1) What types of online communities do you participate in now to support your professional learning growth?

*Please respond on the chat window.*
(2) How does collaboration with others (e.g., colleagues or experts) support your learning?

*Please respond on the chat window.*
A Critical Piece to Growing Professional Learning Communities

- Self-Directed Access
- 9,500+ resources
- Free tools to help teachers organize, personalize, and document their learning growth over time.
- Immediate free access to online advisors and colleagues through chat and discussion.
The NSTA Learning Center

Search Engine

Teacher PD Indexer

Online PD Catalog

University Online Affiliates

Regional/State Face-to-Face PD

Interactive SCORM Learning Objects

F2F Symposia & PD Institutes

Live Web Seminars

Moderated Online Short Courses

E-Journal Articles

Video Podcasts

e-Books and online Chapters

Professional Development Resources and Opportunities

My PD Plan & Portfolio

My Calendar

My Library

My Notepad

My Transcript

Admin Report

NSTA Certification
August 2012 Collection: **9,500+** PD Resources and Opportunities Available

- SciGuides [42]
- Science Objects [91]
- SciPacks [24]
- Archived Seminars/Podcast [1500+]
- Web Seminars [100/yr]
- Short Courses [20+/year]
- Journal Articles [5300+]
- NSTA Press Books [280+]
- e-Books [180+]
- e-Chapters [1600+]
- Symposia [6-10/year]
- PD Institutes [6-10/year]

Resources tagged to filter or sort by learning preference
I have used these resources and/or participated in these opportunities in the NLC

<table>
<thead>
<tr>
<th>Science Objects</th>
<th>e-Journal Articles</th>
<th>Web Seminars</th>
<th>Community Forums</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Seminar Archives</td>
<td>Podcasts</td>
<td>Online Short Courses</td>
<td>SciPacks</td>
</tr>
<tr>
<td>e-Books</td>
<td>SciGuides</td>
<td>e-Book Chapters</td>
<td>Live chat with an Online Advisor</td>
</tr>
</tbody>
</table>
Let’s pause for questions from the audience.
Learning Center
Community
Over 104,000 teachers have searched, selected and added over 905,000 individual resources across their personal libraries from the 9,500 digital learning assets available with a positive growth trend looking ahead!
Building a Vibrant Learning Community

• *Provide opportunities to build reputation and contribute to the community as part of your own personal growth*

• **Over 36,000 badges earned in 2011-2012**
Patricia Rourke
Patricia Rourke leads professional development and moderates online forums in physics and chemistry. She served as Science Chair and physics teacher, creator and instructor of online physics courses, Woodrow Wilson Institutes Director, instructor for AAPT/PTRA programs, leading teacher-moderator for TERC projects, and presented at NSTA, AAPT, and VAST conferences. She sat on boards for NSTA and CSAAPT and received a Sci-Mat Fellowship, competitive science grants, a Tandy Technology Scholar and is a Presidential Awardee.

Wendy Ruchti
Wendy Ruchti has been part of the Educational Foundations Department at Idaho State University’s College of Education since 2008. She received a PhD in Education from the University of Idaho in 2005 with an emphasis in curriculum and instruction in STEM education. At ISU, she has taught several educational foundations courses. Her research interests include elementary science education and creating collaborative online learning environments. Before coming to ISU, she taught middle school science and math.

Kathy Sparrow
Dr. Kathy Sparrow is currently an adjunct professor at Florida International University (FIU), teaching Elementary Science Methods. She previously worked as a middle and high school science teacher as well as the Science Supervisor for Akron Public Schools. She was a Regional Director for SECO, served on the NSTA Board of Directors and was president of the National Science Education Leadership Association (NSEL). Kathy was also awarded the Outstanding National Science Supervisor Award in 1999.
by Adah Stock, Tue Nov 16, 2010 10:32 AM

While looking for something else I came across a great Podcast (7 minutes long) which provided insight on being a scientist and using the scientific method. It is a must for a teacher and students to hear. I suggest you listen to this scientist describe his involvement with the scientific method and then share your thoughts on this as well.

Attachments

Podcast: Scientific Method (Podcast)

by Kathy Renfrew, Wed Nov 17, 2010 10:40 AM

What an awesome discussion. I have spent time reading, researching and reflecting on this thread. There is part of the discussion that I think I disagree with:

"the scientific method is great for young children who have not developed a strong cognitive ability to think. It is the same as you have to learn to walk before you can run. The scientific method is a way for them to gain an understanding of the process. However, as they grow older and have more experiences and make more decisions they should be weaned off this and introduced to scientific inquiry."

I believe all children, even very young children can think scientifically and therefore engage in the inquiry process. I am attaching an article which talks about young children doing science inquiry and a graphic from one of my favorite authors, Karen Worth.

So what do others think?
Community members improve their practice through a variety of activities…

<table>
<thead>
<tr>
<th>Community Activities</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-Solving</td>
<td>“Can anybody help me with...”</td>
</tr>
<tr>
<td>Requests for Information</td>
<td>“Does anybody know where I might find...”</td>
</tr>
<tr>
<td>Seeking Experience</td>
<td>“Has anybody ever...”</td>
</tr>
<tr>
<td>Discussing Developments</td>
<td>“What do you think of the new policy regarding...”</td>
</tr>
<tr>
<td>Documentation Projects</td>
<td>“Here is a copy of the latest revised form to help us...”</td>
</tr>
<tr>
<td>Mapping Knowledge and Identifying Gaps</td>
<td>“Who knows what? What are we missing? Who else might be able to help us?”</td>
</tr>
</tbody>
</table>
Learning Center
Recognition and Rewards
Welcome to Your Personalized Learning Web Space!

Flavio, you've already earned 8205 Activity Points!

You've recently earned: Sapphire Aggregator
Add Personal Resources

You're close to earning: Diamond Commenter
Post 14 more comment/questions

Activity Progress Bar
Your Activity Matters!
It Donates Produce!

With these resources you can build your professional development plan, track your activities and assess your progress. You can start "Explore Learning Opportunities" below or by creating your game plan with the PD Plan and Portfolio tool. You may also review an archived Web Seminar or a multimedia overview of the Learning Center.
Follow your top colleagues' online activity and contributions

**Top Commenters**

Building a worthwhile learning community provides opportunities for you to recognize those leaders that share their ideas, lessons and resources. The top commenters are those that contribute their voice in the discussion forums. Join the dialog!

<table>
<thead>
<tr>
<th>Pos</th>
<th>Name</th>
<th>Commenter Points Earned</th>
<th>Recent Donations/Badges</th>
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<tr>
<td>1</td>
<td>Therese Houghton</td>
<td>3,220</td>
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<tr>
<td>2</td>
<td>LeRoy Atties</td>
<td>2,400</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Allison Cooke</td>
<td>1,980</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Elizabeth Dalzell</td>
<td>1,810</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Lara Smetana</td>
<td>1,800</td>
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<tr>
<td>6</td>
<td>Manuel Vasquez</td>
<td>1,180</td>
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<tr>
<td>7</td>
<td>Sherene McDonald</td>
<td>1,040</td>
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</table>
**Learning Center Profile**

**Kathy Renfrew**

**14100 LC Activity Points**

**Send Kathy a Private Message**

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**About Me:** I taught school for 30+ years. I started my career with two years in Australia where I taught Kindergarten and 4th grade. When I returned to the states, I relocated from Massachusetts to Vermont and have been here ever since. In Vermont, I spent 15 years teaching grade 4 and then 15 years teaching a multiage grade 5/6 in a small rural school with 3 other teachers. For the last 4 years, I have been working as the Elementary Science and Mathematics Specialist. In that role, I have been involved in creating the statewide science and mathematics assessments. I have also been part of a team that has written a Professional Learning Plan to help teachers in the field transition to the Common Core in Mathematics and English Language Arts. Vermont has been one of the lead states working with Achieve to create the Next Generation Science Standards. I have been a co-lead on this project. I am currently serving on the panel that chooses NSTA’s Outstanding Trade Books. In the past I have b

**Affiliation:** VT DOE Elementary Math & Science Coordinator

**Location:** West Barnet, VT

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<table>
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<th>Points</th>
<th>Description</th>
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<td>Wed May 02, 2012 12:18 PM</td>
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<td>Post a comment/question on Learning Center Discussion Forum</td>
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<td>Wed Apr 18, 2012 5:00 PM</td>
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<td>Add a personal resource to your LC library</td>
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<tr>
<td>Tue Apr 03, 2012 4:41 PM</td>
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<td>Add a personal resource to your LC library</td>
</tr>
<tr>
<td>Tue Apr 03, 2012 4:29 PM</td>
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<td>Add a personal resource to your LC library</td>
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<td>Tue Mar 20, 2012 9:53 AM</td>
<td>10</td>
<td>Post a comment/question on Learning Center Discussion Forum</td>
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</tbody>
</table>
Let’s pause for questions from the audience.
Learning Center
Selected Content Resources

FREE Science Objects
Interactive Learning beyond Narrative and Images

Which of the following best describes the concept of inertia?

- Inertia is just a name that describes the fact that an object obeys Newton’s first law.
- Inertia is sort of an “internal force” that actively resists changes in motion. For example, when you try to push something, its inertia pushes back on you.
- Inertia is something that pushes an object along once you have thrown and released it.
- Inertia is something an object has moving, an object loses its inertia.

If a force is exerted on an object, you can be sure the object will accelerate.

Check Your Thinking

False. In order to figure out whether or not an object will accelerate, you must determine the net force acting on it. It’s possible that the force in question is balanced out by another force, leading to zero net force and zero acceleration.
Over 260 free Simulations and Animations
Learning Center
Selected Content Resources
NSTA SciPacks

3-5 Science Objects

Content Mentor
Email Support

10-Hour, self-directed, inquiry-based learning experience

Assessment and Certification

Pedagogical Implications
<table>
<thead>
<tr>
<th>Earth and Space</th>
<th>Physical</th>
<th>Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Earth, Sun, and Moon</td>
<td>• Force and Motion</td>
<td>• Cell Structure and Function</td>
</tr>
<tr>
<td>• Gravity and Orbits</td>
<td>• Energy</td>
<td>• Coral Reef Ecosystems</td>
</tr>
<tr>
<td>• The Solar System</td>
<td>• Nature of Light</td>
<td>• Science of Food Safety</td>
</tr>
<tr>
<td>• The Universe</td>
<td>• Chemical Reactions</td>
<td>• Resources and Human Impact</td>
</tr>
<tr>
<td>• Weather and Climate</td>
<td>• Electric and Magnetic Forces</td>
<td>• Nutrition</td>
</tr>
<tr>
<td>• Rocks</td>
<td>• Atomic Structure</td>
<td>• Cell Division and Differentiation</td>
</tr>
<tr>
<td>• Plate Tectonics</td>
<td>• Explaining Matter with Elements, Atoms, and</td>
<td>• Cells and Chemical Reactions</td>
</tr>
<tr>
<td>• Earth’s Changing Surface</td>
<td>Molecules</td>
<td>• Flow of Matter and Energy in Ecosystems</td>
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<tr>
<td></td>
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<td>• Interdependence of Life</td>
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</tbody>
</table>
Staying on the Leading Edge for Learning with our Interactive Digital Content
We offer 120 free live web seminars during the school year.
Learning Center

Selected Tools to Facilitate Personalization
PD Indexer and The PD Plan and Portfolio

- Diagnose gaps in Content Knowledge Understanding
- View Resources and Opportunities for Consideration
- Add to your Plan
Pre and Postassessment No. of Items | No. of Cases | Internal Consistency*
--- | --- | ---
Earth History | 20 | 111 | .704
Magnetic and Electric Forces | 22 | 114 | .821
Nature of Light | 20 | 105 | .737
Atomic Structure | 16 | 102 | .882
Cell Structure and Function | 23 | 261 | .636
Chemical Reactions | 23 | 101 | .877
Elements, Atoms, & Molecules | 28 | 103 | .812
Cell Division & Differentiation | 22 | 97 | .752
Cells & Chemical Reactions | 24 | 94 | .821
Force and Motion | 25 | 220 | .816
Energy | 20 | 227 | .759
Solar System | 20 | 238 | .695
Plate Tectonics | 20 | 216 | .790

**Identify Evidences**

- **Category:** My Content Knowledge
- **Goal:** Cell Differentiation: Depth of Understanding

**My Tasks:**
- Define Evidence
- Edit Goal
- Delete Goal

---

**Instructions and How To Animations**

**Identified Professional Development Resources**

<table>
<thead>
<tr>
<th>PD Resource to Address Goal</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Division and Differentiation: Continuity of Life</td>
<td>I am a middle level teacher, now responsible for 3 preps, and am teaching in an area with little experience</td>
</tr>
</tbody>
</table>

**Expected Date of Goal Completion**

01/01/2011

**Goal Statement**
- Empty - [Add information]

**Why I chose this goal, and where I am now**
- Empty - [Add information]

**Standards**
My Library
Collections enable you to group together and organize your NSTA resources. You may also share collections with friends and colleagues.

To create a new collection:
- Click "Start a New Collection" below, fill in the brief form and click "Submit".
- Choose items from your library, our resource search page, or upload your own files to add to the collection.

NOTE: NSTA resources must first be added to your library before they can be added to a collection.
- For more help view the My Library Help Guide (1.24 MB PDF) to see screen shots and step-by-step instructions.

My Collections

<table>
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<tr>
<th>Title</th>
<th>Created</th>
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<tbody>
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<td>Assessment</td>
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<tr>
<td>Atomic Structure</td>
<td>10/1/2009</td>
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<tr>
<td>Caterpillars</td>
<td>9/15/2010</td>
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Collections Shared With Me

<table>
<thead>
<tr>
<th>Title</th>
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<tbody>
<tr>
<td>Assessment 2 items</td>
<td>Mike Smith</td>
<td>10/5/2009</td>
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<tr>
<td>Earth Day PD Resources for Teachers of Science 9 items</td>
<td>The Learning Center</td>
<td>4/12/2010</td>
</tr>
<tr>
<td>Earth Sun and Moon 10 items</td>
<td>Sue Leelan</td>
<td>4/2/2010</td>
</tr>
</tbody>
</table>
Over 3,000 collections already publicly shared

Rank and rate public collections
Let’s pause for questions from the audience.
Learning Center

Web-accessible Reports to Document Community Activity and Teacher Learning
State and District Collaborations

- Over 140 unique private/public learning communities across State and District Partnerships using the Learning Center in various blended teacher learning models as of August 2012

- See dozens of administrator, university, and teacher testimonials

http://learningcenter.nsta.org/impact/testimonials.aspx
### Blended Professional Development

- **Integration between Onsite and Online Learning**

- Involves the mix of *pedagogical methods* in combination with various *learning strategies* that involve *technology-mediated solutions* to maximize desired learning outcomes

(Kim, Bonk & Oh, 2008; Smith & Kurthen, 2007; Tang & Bryne, 2007; Vaughan, 2007; Verkroost, Meijerink, Lintsen, & Veen, 2008; Yoon & Lim, 2007)
Individual Users:

- Digital Resource Usage
- Pre/Post & Final Assessment Results
- Community Activity Points and Badges
- PD Plan Learning Goals
11958 total SciPack final assessments finished to date. 7449 passed.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Pre-tests</th>
<th>Post-tests</th>
<th>Avg Score Pre</th>
<th>Avg Score Post</th>
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<tbody>
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<td>Force and Motion Assessment</td>
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<td>Energy Assessment</td>
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<tr>
<td>Oceans Effect on Weather and Climate Assessment</td>
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Totals as of 6/7/2012.
Learning Center
Impact Studies and Research

http://learningcenter.nsta.org/research/
Research and Dissemination

• **Quasi-experimental Design Study**: Across 3 districts finding *significant gains in teacher content knowledge using single SciPack*. (2008). n=45, teachers in grades 5-8

• **Experimental Design Study**: Pretest-posttest delayed-treatment/control group design with random assignment finds *significant gains in teacher content knowledge, teacher self-efficacy, and students’ gain scores for grades 5-8 in treatment group across two SciPacks*. (2009-2010), n = 56

• **Descriptive Study**: Dissertation research finds *significant gains in teacher learning* for pre-posttest and pretest-final assessment. (2010). n = 85, teachers grades 3-6 from 11 different states.


See: [http://learningcenter.nsta.org/research/](http://learningcenter.nsta.org/research/)
Ongoing Research

- **NSF VOSS study**: as Co-PI with RAND Corporation looking at which affordances are of greatest import and impact within our online community (Dr. Susan Strauss).

- **NSF DRK12 study**: Smaller study, part of approved re-allocation to look at our blended PD district-based efforts with EDC (Dr. Lauren Goldenberg).

- **US Department of Education, Office of Educational Technology on-going research**: Connected Educator’s Project with AIR, SETDA.org and COSN.org (Dr. Darren Cambridge).
Connected Educator Month

- A month-long free online event organized by the U.S. Department of Education’s Connected Educators
- August 2012, as you ramp up for the new year
- Numerous activities:
  - Forums on key education and community issues
  - Webinars and other real-time events
  - Guided tours, open houses, launches, exhibits, collaborative projects, polls, and other special activities
  - Contests you can enter, badges you can earn
- Signing up takes five seconds, at http://connectededucatormonth.org/
A Critical Piece to Growing Professional Learning Communities

• Self-Directed Access
• 9,500+ resources
• Free tools to help teachers organize, personalize, and document their learning growth over time.
• Immediate free access to online advisors and colleagues through chat and discussion
On the Horizon: Learning Expeditions!
Thank You

- Al Byers
  Email: abyers@nsta.org

- Flavio Mendez
  Email: fmendez@nsta.org

Don’t forget to complete the evaluation survey and select your free SciPack!
Thank you to the sponsor of tonight's Web Seminar:

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