Developing Large Scale Effective Teacher Learning Communities at the National Science Teachers Association

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Acting Associate Executive Director, Services
National Science Teachers Association

http://learningcenter.nsta.org/iste
http://learningcenter.nsta.org/impact

ISTE, 2013, San Antonio, TX
Professional Learning Networks to motivate Teacher Learning: Research involving the NSTA Learning Center
Convention Center 103A


2:00-3:00 pm: Developing Large-Scale Effective Teacher Learning Communities at NSTA. Al Byers, NSTA

3:45-4:45 pm: Online Communities of Practice for Professional Development: What’s in It for Us? Susan Straus, RAND
Goals for this Talk

- Gather audience insights and purpose
- Share an overview of our e-learning portal and the need it addresses
- Share strategies behind the design and affordances provided via our online professional learning community
- Share and discuss research findings and studies that are supporting our on-going design efforts.
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Setting the stage and sharing insights:

- Why did you select this session?
- What are examples of professional learning communities (large or small) you are familiar with and why do you think they are successful?
- How might one compare or define a Community of Practice to a Professional Learning Community?
Barclay! The adjacent school district’s test scores went up 25% last year apparently due to ‘professional learning communities.’ Whatever that is...I want two of them!
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Need: Importance of Teacher Learning

- A significant, positive correlation exists between student achievement and teachers’ content knowledge (subject matter & pedagogical content knowledge)

- Detrimental effects occur when teachers do not feel confident in science

Teacher Learning appears effective when it addresses

**Teachers’ Belief System**
Elicit existing attitudes, experiences, and self-efficacy towards science education and understandings regarding the nature of science

**Subject Matter Knowledge and Pedagogical Content Knowledge**
Knowledge of science content including representations & metaphors, along with ability to develop and implement inquiry-based lessons to facilitate students’ deeper understanding and active learning

**Understanding How Students Learn**
knowledge of formative assessment strategies to help make students’ thinking visible as build upon students’ existing knowledge and prior experiences through social discourse
The Framework and Next Generation Science Standards have a New Vision of Science Learning that Leads to a New Vision of Teaching

Intertwine three dimensions

- Scientific and Engineering Practices
- Disciplinary Core Ideas
- Cross-cutting Concepts
Back to you! What are promising practices for teacher learning (PD)?

- Job-embedded, aligned to local curriculum
- Informed by student learning data and work
- Part of local PLC or CoP (building capacity from within, collaborative)
- On-going, year long, of sufficient duration, intensity, and coherence. (50-80 hours/year)
- Addresses teachers’ personal learning needs/preferences within district strategic initiatives (bounded autonomy)
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.

Primary Technical Working Group

- Robert M Bernard, Concordia University
- Richard E. Clark, University of Southern California
- Barry Fishman, University of Michigan
- Dexter Fletcher, Institute for Defense Analysis
- Karen Johnson, Minnesota Department of Education
- Mary Kadera, PBS
- Susan Patrick, NACOL
- Kurt Squire, University of Wisconsin
- Bill Thomas, Southern Region Education Board
- Bob Tinker, Concord Consortium
- Julie Young, Florida Virtual High School

September 2010
Selected Excerpts of Analysis

- Literature review from 1996 to 2008, more than 1,000 studies, *50 met rigor for meta-analysis*

- On average, *students in online learning performed modestly better* than those receiving f2f instruction (few studies, mostly corporate/IHE’s)

- From 50 independent effects identified for meta-analysis comparisons, *11 significantly positive effects favoring online and blended learning*, 3 favoring f2f.

- Instruction *combining online and f2f elements had a larger advantage* relative to purely f2f instruction or purely online instruction
  - Blended vs. Face-to-Face
    Mean effect size +0.35,  \( p < .001 \)
  - Online vs. Face-to-Face
    Mean effect size +0.05,  \( p = .46 \)
Blended Professional Development

- Integration between Onsite and Online Learning

- Involves the mix of *pedagogical strategies* in combination with various *modes and mediums* leveraging *technology-mediated solutions* to maximize desired learning outcomes

(Kim, Bonk & Oh, 2008; Lockee, BB., Moore, M., Burton, J., 2001; Smith & Kurthen, 2007; Tang & Bryne, 2007; Vaughan, 2007; Verkroost, Meijerink, Lintsen, & Veen, 2008; Yoon & Lim, 2007)
Blended PD: Models for Delivery

- **Anchor Blend**: Begins with f2f and continues online

- **Bookend Blend**: Meet online for pre-work before initial f2f, follow-up online for continued discussion

- **Field Blend**: Most self-directed, where learners control the pace and time for learning, gaining access to resources and support online when and where they need them.

*(Kim, Bonk & Oh, 2008)*
Blended PD: Models for Student Delivery

- **Rotation**—Within a given course or subject, students rotate on a fixed schedule or at the teacher's discretion between learning modalities, at least one of which is online learning.

- **Flex**—Content and instruction are delivered primarily by the Internet, students move on an individually customized, fluid schedule among learning modalities, and the teacher of record is on site.

- **Self-Blend**—Students choose to take one or more courses entirely online to supplement their traditional courses; the teacher of record is the online teacher.

- **Enriched Virtual**—A whole-school experience in which, within each course, students divide their time between attending a brick-and-mortar campus and learning remotely using online delivery of content and instruction.

(Innosight Institute, 2011)
## Research in Online and Blended Learning

<table>
<thead>
<tr>
<th>Study</th>
<th>PD Program Model</th>
<th>Target Audience/Content Area</th>
<th>Research Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berger et al. (2008)</td>
<td>Blended online and face-to-face</td>
<td>High School Physics (n=16)</td>
<td>Strong online participation linked to student work, Your Comments, Hot Polls, Hot Reports, Smashing Sentences</td>
</tr>
<tr>
<td>Krall et al. (2009)</td>
<td>Self-paced, on-demand, hands-on kits, mentor</td>
<td>Elementary and Middle Science and Inquiry (n = 43)</td>
<td>Significant gains in subject knowledge. Hands-on most valued. Low mentor rating via email -- too critical</td>
</tr>
<tr>
<td>Owston et al. (2008)</td>
<td>Blended online and face-to-face</td>
<td>Middle School Science &amp; Math (n = 33)</td>
<td>Significant gains in teacher perception of inquiry. Weak online participation. Challenges in online component even when provide release time. Reading articles and commenting.</td>
</tr>
</tbody>
</table>
## Research in Online and Blended Learning

<table>
<thead>
<tr>
<th>Study</th>
<th>PD Program Model</th>
<th>Audience &amp; Content</th>
<th>Research Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>del Valle et al. (2009)</td>
<td>Self-paced, 12 week module, instructor help</td>
<td>K-12 in-service teachers (n=59)</td>
<td>Mastery-sig. time over longer period, Task-focused-less time in shorter period, not prefer cohort learning. Procrastinator-little time, longer period to complete, prefers cohort learning.</td>
</tr>
<tr>
<td>Lowes et al. (2007)</td>
<td>4-week course, async discourse, readings, group project at end. 6 schools, 3 states</td>
<td>Middle &amp; High (grades 6-10), school-wide reform</td>
<td>Online discourse analysis. Cheerleader-affirming + new information increases online participation. Vary over course to more questioning/challenging at end.</td>
</tr>
<tr>
<td>Whitaker (2007)</td>
<td>On-demand: 3 levels of support. A) web access B) reflection tools, resources, C) 1-on-1 video chat and teaching clip.</td>
<td>pre-K teachers (n=235)</td>
<td>Level of service significantly affects teacher participation. Group C log on more, Group A log on for longer periods of time, but significantly less frequently. Personalized feedback strongly valued. Better to respond quickly with brief message that delayed with longer posts</td>
</tr>
</tbody>
</table>
## Berger et al. (a deeper look at integration)

<table>
<thead>
<tr>
<th>The Tool</th>
<th>Main Design Goals</th>
<th>Ways of Enactment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Your Comments</strong></td>
<td>Enable elaboration of and reflection on ideas that had been previously raised in program</td>
<td>Every few days, program facilitator selected interesting statements from transcripts of teachers’ discourse in f2f meetings or from online postings, posted it to form and invited teachers to relate to it.</td>
</tr>
<tr>
<td><strong>Hot Polls</strong></td>
<td>To summarize previously raised ideas, to encourage reflection on them and promote participation of newcomers</td>
<td>Every 2 weeks facilitator composed a poll based on a central issue discussed in previous f2f meeting. The 3-5 multiple choice answers were often selected from interesting comments from teachers on issue. In forum teachers encouraged to elaborate on their vote.</td>
</tr>
<tr>
<td><strong>(plus) Hot Reports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Smashing Sentences</strong></td>
<td>To encourage teachers to be attentive to their students’ reflections</td>
<td>Teachers were asked to sort out and post some of the most meaningful and interesting (“smashing”) sentences from their students reflections on specific new PD-supported activities. Teachers became more aware of student’s thinking and shared with colleagues.</td>
</tr>
</tbody>
</table>
Anderson’s Equivalency of Interaction Theory

Learner-learner, learner-content, and learner-instructor interaction are preferred for online learning. When diminished support may not permit all three types to be provided when going to scale, if one of the three interaction types is designed well, the other two may be offered in a diminished capacity and still provide an equitable learning experience.

Review of selected blended PD research

*Here’s the top five:*

- Personalized and catered to teachers’ individual learning needs and preferences
- Collaborating with other like-minded colleagues
- Organizational and Administrator support is critical
- The need and value to closely integrate online and onsite strategies for coherence across the school year
- Teacher engagement and recognition strategies are crucial (a little goes a LONG way)
Learning Center Overview
A Critical Piece of the Teacher Learning Solution

• Self-Directed Access
• 10,700+ resources
• Free tools to help teachers diagnose, organize, personalize, and document their learning
• Immediate free access to online advisors and colleagues through chat and discussion

http://learningcenter.nsta.org
Teacher indexes learning needs

Resources, and opportunities suggested

Teacher selects based on unique needs/preferences. Creates Growth Plan

joins others

Group discussion online

knowledge assessment

Just-in-time, on-demand learning resources and diagnostic tools

Into Teacher Portfolio

Live Online Advisor “Help desk” and email Content Mentors

Analytical Research Database

takes moderated course

Professor for graduate credit online
灶食**The National Science Teachers Association**

Jun 2013: **10,700+** Learning Resources and Opportunities Available

<table>
<thead>
<tr>
<th>Do-It-Yourself Learning</th>
<th>Live Online Seminars &amp; Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science Objects [94]</td>
<td>Short Courses [20+/year]</td>
</tr>
<tr>
<td>SciPacks [24]</td>
<td></td>
</tr>
<tr>
<td>Archived Seminars/Podcast [1,840+]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Books &amp; Articles</th>
<th>In Person Experiences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal Articles [5,700+]</td>
<td>Symposia [6-10/year]</td>
</tr>
<tr>
<td>NSTA Press Books [294+]</td>
<td>PD Institutes [6-10/year]</td>
</tr>
<tr>
<td>e-Chapters [2,093+]</td>
<td></td>
</tr>
</tbody>
</table>

Resources tagged to filter or sort by learning preference
The Learning Center has grown substantially since 2010

- **123,367 Active Users**: 22,489 Members (18.2%) and 100,878 Non-Members (81.8%)
- **Active User Growth**:
  - 12,030
  - 12,140
  - 12,336.7

- **1,105,083 Resources in Libraries**:
  - 43,606.2
  - 61,342.7
  - 853,602
  - 1,105,083
Learning Center
Selected Tools to Facilitate Personalization and Sharing
PD Indexer and The PD Plan and Portfolio

- Identify Personal Learning Needs in Core Ideas of Science
- View Resources and Opportunities for Consideration
- Add to Your Individual Growth Plan
Cronbach Alpha Internal Consistency

<table>
<thead>
<tr>
<th>Pre and Postassessment</th>
<th>No. of Items</th>
<th>No. of Cases</th>
<th>Internal Consistency*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth History</td>
<td>20</td>
<td>111</td>
<td>.704</td>
</tr>
<tr>
<td>Magnetic and Electric Forces</td>
<td>22</td>
<td>114</td>
<td>.821</td>
</tr>
<tr>
<td>Nature of Light</td>
<td>20</td>
<td>105</td>
<td>.737</td>
</tr>
<tr>
<td>Atomic Structure</td>
<td>16</td>
<td>102</td>
<td>.882</td>
</tr>
<tr>
<td>Cell Structure and Function</td>
<td>23</td>
<td>261</td>
<td>.636</td>
</tr>
<tr>
<td>Chemical Reactions</td>
<td>23</td>
<td>101</td>
<td>.877</td>
</tr>
<tr>
<td>Elements, Atoms, &amp; Molecules</td>
<td>28</td>
<td>103</td>
<td>.812</td>
</tr>
<tr>
<td>Cell Division &amp; Differentiation</td>
<td>22</td>
<td>97</td>
<td>.752</td>
</tr>
<tr>
<td>Cells &amp; Chemical Reactions</td>
<td>24</td>
<td>94</td>
<td>.821</td>
</tr>
<tr>
<td>Force and Motion</td>
<td>25</td>
<td>220</td>
<td>.816</td>
</tr>
<tr>
<td>Energy</td>
<td>20</td>
<td>227</td>
<td>.759</td>
</tr>
<tr>
<td>Solar System</td>
<td>20</td>
<td>238</td>
<td>.695</td>
</tr>
<tr>
<td>Plate Tectonics</td>
<td>20</td>
<td>216</td>
<td>.790</td>
</tr>
</tbody>
</table>

Category: My Content Knowledge
Goal: Cell Differentiation: Depth of Understanding
My Tasks: Define Evidence

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 Education: Continuity of Life</td>
<td>I am a middle level teacher, now responsible for 3 preps, and I am teaching in an area with little experience</td>
</tr>
</tbody>
</table>

Expected Date of Goal Completion
6/1/2011

Goal Statement
- Empty - Add information

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

Standards
My Library

Upload and share your own resources

Over 4,000 public collections shared

Two GB free space for your personal files

Sharing Resources

Assessment
One of the biggest challenges to the more widespread use of inquiry is the difficulty teachers have in identifying appropriate activities.

Intended for: Elementary, Middle school

- Share this Collection
- Make this Collection Public

Currently displaying items: 1 - 2 of 2

Sort By: Title

A Rubric for Selecting Inquiry-Based Activities
Type: Journal Article
Days Remaining: Unlimited
Grade: Middle School
Summary: One of the biggest challenges to the more widespread use of inquiry is the difficulty teachers have in identifying appropriate activities. Teachers can structure the use of inquiry in the classroom with this rubric based on the National Science Education...

Assessing Student Presentations From Three Perspectives
Type: Journal Article
Days Remaining: Unlimited
Grade: Middle School
Summary: Analyzing student presentations from three perspectives—expert, peer, and self—provides extended feedback and opportunities to learn. All three of these are helpful and serve different purposes. The expert (teacher) feedback shows how the teacher views...
Learning Center
Selected Resources and Opportunities
• Two-hour free online learning experience in a particular topic
• Interactive simulations of phenomena in an engaging way
• Questions to promote learning via 5-E inquiry strategy
• Based on Disciplinary Core Ideas in the NGSS
• Over eighty (94) free Science Objects currently available
Animation Analysis

The following animation shows a ball rolling along a track. Replay the motion a number of times and then answer the multiple-choice questions that follow. In answering those questions, feel free to replay the animation if necessary. Select the icon to launch the animation in a new window.

Figure 5.2. Ball on Complex Track Animation
For those unable to engage with the interactive component, select this link for a long text description: Text Description

Practice
Okay, now that those mental wheels are turning, see if you can answer these questions. If you miss an answer or two or three, it might be worth your while to review the appropriate sections of this Science Object.

Q What is the approximate position of Point E in relationship to Point A?

- E is about 350 centimeters away from A, at an angle of about 80 degrees with respect to Line Y.
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
NSTA offers 120 free live web seminars during the school year.

Over 533 delivered with 27,000 educators reached since 2004.
Selected Participant comments

- This was one of the best. It broke down the practice conceptually and provided specific examples for implementation.
- I learned new information that I can share with my class tomorrow!
- I loved the interactive nature of this presentation. I felt involved every step of the way.
- This was an excellent, worthwhile session. It refreshed my memory about some important concepts.
- Thank you for the resources. This will be a big help to my teaching.
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Learning Center
Community
Building a Vibrant Learning Community

- Psycho-emotional Roles for Growth and Recognition
- Compelling Content
- Moderated Social Learning Discourse
Interaction Opportunities

**Consume/Engage/Excite**
- Just-in-time resources from trusted source and/or colleagues

**Consume/Contribute/Extend**
- Resources/Strategies support local student-driven data
- Professional Learning Community

**Consume/Mentor/Enlighten**
- Elevate stature in community
- Serve in leadership capacity
- Contribute to improvement and generation of resources
- Refine strategies, support others

**Early Career/Novice**
- Increase Knowledge, Confidence, and Pedagogy

**Mid Career**
- Hone practice and Pedagogical Content Knowledge

**Experienced Teachers**
- Contribute (coach/mentor)

**Collaboration and Recognition**
- Deeper Exchangement
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.

Lara Smetana
Lara Smetana is an assistant professor of science education at Southern Connecticut State University. She brings classroom experience as an 8th grade physical science teacher and has worked with a variety of informal education programs across the country. Lara teaches courses in elementary science methods and educational technology and mentors student teachers. Her research interests include pre- and in-service teacher education and the use of educational technology in science teaching and learning.

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 (NSELA). Kathy was also awarded the Outstanding National Science Supervisor Award in 1999.
Growth across all community forums

- 12 Discussion Forums
- 2,200+ User Generated Topics
- 22,000+ Posts by Users
- Physical Science
- Life Science
- Earth/Space Science
- Pedagogy
- Evaluation/ Assessment
- Research in Science Ed
- STEM
- NGSS
Learning Center Profile

About Me: As a teacher, I bring experience to my work at the Vermont Agency of Education. I am co-lead in Vermont’s role in NGSS development. As the Elementary Science & Mathematics Specialist I assist with the implementation of the CCSS in both Mathematics and English Language Arts. Recently our team developed a Short Focused Research Project based on science content for K-2 students that is being shared regionally throughout the state. I am a member of a collaborative team of specialists from New Hampshire, Rhode Island and Measured Progress who develop, and construct the NECAP science assessment. In 2000, I was honored as Vermont’s elementary Presidential Award for Excellence in Science Teaching. I am an active NSTA member who is currently on the committee that chooses the Outstanding Science Trade Books.

Affiliation: VT Agency of Education

Location: West Barnet, VT

Badges Earned:
Integrating high quality content with moderated discourse to improve personal practice:

I use the Learning Center to **share ideas** that I have and **learn more about the ideas of others**. What I’ve found in our practice is that, **if you isolate yourself, it basically stunts your growth**... there’s no follow-up or conversation with other educators... **So the opportunity to talk “education” in these forums is very valuable**, you get insights from other people regarding these resources. In that way **it has been very crucial to my growth** as an educator...

Teacher
Recognition
Administrator
Affirmation
Welcome to Your Personalized Learning Web Space!

Albert, you've already earned 2765 Activity Points!

You've recently earned:
- Platinum Indexer
- Complete Indexers
- Diamond Commenter
- Post 25 more comment/questions

You're close to earning:

Activity Progress Bar

Your Activity Matters!
It donates Books and Pencils!

Update Your Profile  Check the Leader Boards

With these resources you can build your professional development plan, track your activities and assess your progress. You can start at "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 Community Forums. Join the dialog!

<table>
<thead>
<tr>
<th>Pos</th>
<th>Name</th>
<th>Commenter Points Earned</th>
<th>Recent Donations/Badges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dorian Janney</td>
<td>3,440</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Therese Houghton</td>
<td>3,230</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Angelika Fairweather</td>
<td>2,670</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>LeRoy Attles</td>
<td>2,430</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Lorrie Armfield</td>
<td>2,050</td>
<td></td>
</tr>
</tbody>
</table>
Pre-Service Methods Professor: I have to admit that I was skeptical about the points/badges system working with my students, but I was SO-O-O-O wrong! I simply put an announcement on Blackboard praising the top folks to date over the weekend. I didn't even think about the fact that the only man in one class had the overall top points. Several young women announced, "We can’t let Terry get away with that!"
And so it began.... Sally mocked them for not checking their profile page for updates on their points...I haven't met with my other class yet, but they too have upped the ante. I don't know what their reason is. I just know that a small group has infected the larger group.

http://learningcenter.nsta.org/impact/testimonials.aspx
Recognizing Teacher Learning and Leadership

- Provide opportunities to build reputation and contribute to the community and as part of your own personal growth
- Over 48,000 badges earned in 2011-2012

Administrator: One of our teachers sent the following information after receiving a note from NSTA that stated: Congratulations! You have been selected as the NSTA Learning Center Top Advocator for the week of May 28 – June 3, 2012.

She was delighted and wrote, "Look at what I got in my email! ...NSTA picked me!! It's all because of you that I started this science journey in the first place! Thank you!!"
Badges to encourage community activity and sharing

**Disseminator: Share an LC collection**

10 Activity Points (AP)

*Select a collection to share*

- **Onyx Disseminator** - Share a collection with 1 person
- **Sapphire Disseminator** - Share a collection with 50 people
- **Pearl Disseminator** - Share a collection with 5 people
- **Diamond Disseminator** - Share a collection with 100 people
- **Ruby Disseminator** - Share a collection with 10 people
- **Platinum Disseminator** - Share a collection with 150 people
- **Emerald Disseminator** - Share a collection with 25 people
Badges to encourage and document significant learning

Complete and pass a SciPack final assessment 100 Activity Points (AP)
View the Sci Packs

SciPack Activator - Complete 1 SciPack and pass the Final Assessment

SciPack Optimizer - Complete 3 SciPacks and pass the Final Assessment

SciPack Accelerator - Complete 6 SciPacks and pass the Final Assessment

To earn your Activity Points after completing the SciPack final assessment, visit the My PD Record and Certificates page. While there you may view, save, and print your SciPack certificate.

Complete all SciPacks within Physical Science 1000 Activity Points (AP)
View the Sci Packs

PS SciPack Ultimater - Complete all SciPacks within Physical Science

Notice relative weighting of activities. Those that take more effort earn more points.
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- Share and discuss research findings and studies that are supporting our on-going design efforts.
Learning Center

Impact

Pre/Post Assessment Results
Testimonials
Awards
Peer-reviewed Publications
Conference Proceedings
Third-Party Evaluations

http://learningcenter.nsta.org/impact
Peer-Reviewed Journals, Proceedings, and Books

- First steps towards a social learning analytics for online communities of practice for educators. International Learning Analytics and Knowledge Conference (2012).
Third-party Evaluation Studies

• **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 Studies

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

- **NSF DRK12 study**: Smaller study, looking at our blended PD district-based efforts with EDC (Lauren Goldenberg and Marian Pasquale).

- **US Department of Education, Office of Educational Technology ongoing research**: Connected Educator’s Project looking at community management and value creation with the American Institutes for Research and the Friday Institute for Educational Innovation (Darren Cambridge, Sherry Booth, Shaun Kellogg).

Locate ISTE PDF of PPT at: [http://learningcenter.nsta.org/iste](http://learningcenter.nsta.org/iste)
Articles, Interviews, Panels, and Case Studies

Forthcoming Article and web seminar discussion on July 24 1:00-2:00 PM EST
With insight from AIR...

CS 10K Community Work Plan
January 2013, NSF CS PI Conference

“The [CS10K Community] site will issue digital badges, modeled off of the National Science Teachers Associations’ Learning Center badging System, to recognize teachers with specific qualifications, expertise, experiences, or contributions to the community.”

Effort sponsored by the US Department of Education, Office of Education Technologies, and the National Science Foundation
Learning Center
Accountability
Administrator Web Reports
Document Teacher Activity
Teacher Learning
Application in the classroom
Accountability system for districts; collect data on usage by individual, manage the content on your districts’ home page, analyze pre/post test scores and other activity data.
Individual Users: track digital resource usage, pre/post final assessment results, community activity, and PD Plan Learning Goals

Click on a users name to see all of the resources they've added to their library via the subscription.

- [Export Pre/Post-Test Results (sorted by SciPack)]
- [View overall activity for this group]

<table>
<thead>
<tr>
<th>User</th>
<th>Date Registered</th>
<th># of Resources via Subscription</th>
<th>Last Active</th>
<th>Activity Points</th>
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### District/University Pre-Post Assessment Results

#### Energy Assessment
- 1183 Pre-tests taken with a 64% avg score
- 463 Post-tests taken with a 73% avg score
- Totals as of 5/7/2013

#### Earth's Changing Surface Assessment
- 341 Pre-tests taken with a 61% avg score
- 95 Post-tests taken with a 74% avg score
- Totals as of 5/7/2013

#### Cell Structure and Function Assessment
- 415 Pre-tests taken with a 59% avg score
- 116 Post-tests taken with a 70% avg score
- Totals as of 5/7/2013
### Individual User Detail for Teacher name

<-- Back to list  View this user's profile page

<table>
<thead>
<tr>
<th>Title</th>
<th>Resource Type</th>
<th>Date Added</th>
<th>Reports</th>
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Activity

Activity for Teacher name

11/1/2010 to 4/13/2013

3970 Total Points

298 Add NSTA Resource
0 Create Collection
4 Complete Indexer
0 Add Event
0 Add Personal Resource
2 Attend Web Seminar
5 Complete SciPack
2 Write Review
0 Recommend Resource
15 Post comment/question
0 Share Collection
0 Publicize Collection
0 Create Portfolio
0 Create Portfolio Goal
0 Upload Evidence
0 Complete Reflection
0 Generate Report

Submit
Export Activities
The NSTA Learning Center

**Purpose:** To enhance the personal learning of teachers by providing a suite of tools, resources, and opportunities to support their individual long-term professional growth based on their unique learning needs and preferences and within a professional learning community.

http://learningcenter.nsta.org
Developing Large Scale Effective Teacher Learning Communities at the National Science Teachers Association

Thank You

Al Byers
PH: 703-312-9294
Email: abyers@nsta.org

SLIDES
http://learningcenter.nsta.org/iste