Blending Online and Onsite Professional Development: Applying What the Research Says for Effective and Sustainable Learning Communities

Al Byers, Ph.D.
Assistant Executive Director
e-Learning and Government Partnerships
National Science Teachers Association
Goals for this Talk

- Provide an awareness of selected blended PD research findings in science education
- Discuss promising practices and potential pitfalls with blended PD models and how to help sustain and increase the effectiveness of local professional learning communities.
- Showcase NSTA’s solution to assist with your needs: The NSTA Learning Center
- Share impact and efficacy studies of our efforts
Barclay! The adjacent school district’s test scores went up 25% last year apparently due to ‘blended-learning.’ Whatever that is... I want two of them!
Blended Learning Models Generating Lessons Learned

A variety of models for mixing face-to-face education and online instruction are generating lessons learned

By Katie Ash

Since blended learning exploded onto the K-12 scene with promises of personalized and student-centered learning, it has proliferated into dozens of different models, with educators continually tweaking and changing those methods to find the perfect balance of face-to-face and online instruction to meet the needs of their students.

Interest in blended education remains high, spurred partly by research offering support for advocates' claims that blended learning is more effective than either online or face-to-face instruction on its own.
Review of Your Perceptions Regarding Blended PD Research Online Survey Results
Pre-Survey

I have implemented a blended learning effort (onsite and online) for teachers in my district.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td></td>
<td>29.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No</strong></td>
<td></td>
<td>70.2%</td>
</tr>
</tbody>
</table>

n = 48
I have implemented a blended learning effort (onsite and online)

- We offer *blended courses* of biology, earth science, oceanography, ecology and chemistry at our high school alternative Ed site.

- We encourage our teachers to use online resources especially ones that *provide a more realistic view of science concepts* as well as onsite textbooks and resources.

- We use a blended learning process to train teachers in GIS. We also *use PD 360* in our district to provide staff development for teachers.

- I have tried to have blended professional development for teachers (very small steps). They *meet first face to face* and then learn, *share and discuss in subsequent sessions on line*.

- Our PD courses (for teachers across school divisions) use *Moodle* course management system to facilitate learning beyond the physical classroom with online *discussion boards, file sharing, and overall communication*. My pre-service teachers have used NSTA learning packs to teach themselves content which we then discuss onsite.

- *Not sure what the definition of "blended learning effort" is?*
I think there is some value to a blended learning approach for teacher professional development?

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>42.6%</td>
</tr>
<tr>
<td>Agree</td>
<td>57.4%</td>
</tr>
<tr>
<td>Disagree</td>
<td>0.0%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
I think there is some value to blended learning for teacher PD

- We are just beginning to explore this option in my work now because some of our participants are from rural parts of the state. [PLACE]
- *Time constraints* make online sometimes better than onsite. [PACE]
- We readily see students learn in different modalities, but we think adults don't?
- I think it should be a blended approach, *never all through technology*.
- Blended learning is a way to *extend the P.D. experience* and *promote collaboration* among P.D. cohorts. [allows for *sustained PD support*]
- Not everything has to be done in person. By *being purposeful about what has to happen "in person"*, we maximize time together.
- I believe teachers need to collaborate *outside of their own school* and even *outsider their own school division*. Face to face establishes connections while online *keeps the connections growing*.
- Makes sense.
I think blended PD might best described as:

<table>
<thead>
<tr>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing access to an online repository of digital content to enhance onsite PD experiences</td>
<td>25.5%</td>
</tr>
<tr>
<td>Extending face-to-face summer experiences online via discussion with other colleagues on promising practices and strategies for pedagogy</td>
<td>25.5%</td>
</tr>
<tr>
<td>Interacting in real time online throughout the year with leading scientists, engineers, and education experts from institutions such as US Department of Education, NASA, NOAA, and NSF discussing research with examples of applications for the classroom</td>
<td>17.0%</td>
</tr>
<tr>
<td>Helping teachers diagnose and create long term growth plans that cater to their unique learning needs and connects them with resources and access to others with similar learning goals online whereby they might receive recognition and attribution as they collaborate</td>
<td>31.9%</td>
</tr>
</tbody>
</table>
I would like to know the following about blended learning for teachers:

<table>
<thead>
<tr>
<th>Question</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>What does the research say about the value of blended learning?</td>
<td>61.7%</td>
</tr>
<tr>
<td>What challenges might I encounter in deploying a blended learning effort for teachers?</td>
<td>63.8%</td>
</tr>
<tr>
<td><strong>What are strategies that might enhance blended learning efforts?</strong></td>
<td>76.6%</td>
</tr>
<tr>
<td>What are various blended learning models used by others?</td>
<td>63.8%</td>
</tr>
<tr>
<td>What effort and time commitment will I as an administrator need to dedicate to support a blended learning teacher model?</td>
<td>44.7%</td>
</tr>
<tr>
<td>Are recognition systems with points, attribution, and badges linked to online personal profiles, digital portfolios, a passing trend, or is there something there?</td>
<td>21.3%</td>
</tr>
</tbody>
</table>
Why Provide Teacher PD at All?

- 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.

Professional Development:
Appears effective when it addresses the following

- **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
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 PD

<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 PD

<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> (plus)</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>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>
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</tbody>
</table>
Learning Center Overview
A Critical Piece of the Teacher Learning Solution

• Self-Directed Access
• 10,100+ 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

Teacher indexes learning needs

Self directed study

Join others

Group discussion online

Knowledge assessment

Analytical Research Database

Into Teacher Portfolio

Live Online Advisor “Help desk” and email Content Mentors

Takes moderated course

Professor for graduate credit online
Nov 2012 Collection: **10,100+** PD 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>SciGuides [42]</td>
<td>Web Seminars [120+/yr]</td>
</tr>
<tr>
<td>Science Objects [94]</td>
<td>Short Courses [20+/year]</td>
</tr>
<tr>
<td>SciPacks [25]</td>
<td></td>
</tr>
<tr>
<td>Archived Seminars/ Podcast [1,670+]</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 [5,500+]</td>
<td>Symposia [6-10/year]</td>
</tr>
<tr>
<td>NSTA Press Books [300+]</td>
<td>PD Institutes [6-10/year]</td>
</tr>
<tr>
<td>e-Chapters [1,800+]</td>
<td></td>
</tr>
</tbody>
</table>

Resources tagged to filter or sort by learning preference
Teachers are adding over 963,000 resources across their personal libraries from the 10,000 assets available with a strong growth trajectory!
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
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>

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
6/1/2011

Goal Statement
- Empty - Add information

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

Standards
My Library

Over 7,400 collections available

Rate and share public collections

Upload and share your own resources

2 GB free space!
Learning Center
Community
Building a Vibrant Learning Community

- Psycho-emotional Roles for Growth and Recognition
- Compelling Content
- Social Engagement Opportunities
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 discussions

- 13 Forums
- 1,322 Topics
- 15,553 Posts
- Physical, Life, Earth/Space
- Pedagogy
- Evaluation/Assessment
- Research in Science Ed
- Technology Integration
- NGSS
Learning Center
Recognition and Rewards
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**

Activity Progress Bar
**Your Activity Matters!**
It donates Books and Pencils!

With these resources you can build your professional development plan, track your activities and assess your progress. You can start by "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.

**Explore Learning Opportunities**
- Advanced Search
- See all FREE Lesson Plans
- See all FREE Resources

This Week's
**Highest Rated Collections**
**Interdependence of Life**
Shared by: Alison Rivera

Jennifer M Tanko
Last Week's Top Advocator

Update Your Profile
Check the Leader Boards

Search Community
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>3,330</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>
<tr>
<td>6</td>
<td>Bambi Bailey</td>
<td>2,020</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Allison Cooke</td>
<td>1,980</td>
<td></td>
</tr>
</tbody>
</table>
Testimonials from teachers, administrators and professors

**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-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.

Recognizing Teacher Learning and Leadership

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

• **Over 36,000 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 ladies that I started this science journey in the first place! Thank you!!"
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.

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

NSA Science Simulation: Make a Reef
NSA Science Simulation: Seismic Waves
NSA Science Simulation: Air Track
NSA Science Simulation: Vertical Balloon
NSA Science Animation: Angles & Distance
NSA Science Animation: Velocity & Speed

CONTROL PANEL
SUBMIT
RESET

INSTRUCTIONS

RIGIDITY: HIGH
RIGIDITY: LOW

TEST FOR:
Rigidity: High
Density: Low

CONTROL PANEL
START
STOP
RESET

INSTRUCTIONS

AVERAGE SPEED

Wally, Dory, Tank the Tortoise had a considerable challenge with speed and the hare, Mal, had to overcome his challenge with overall average speed.
NSTA SciPacks

3-5 Science Objects

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

Content Mentor Email Support

Assessment and Certification

Pedagogical Implications
LIVE INTERACTIVE LEARNING @ YOUR DESKTOP

We offer 120 free live web seminars during the school year.

Social engagement
Learning Center

Web-accessible Reports to Document Community Activity and Teacher Learning
District Pre/Postassessment Results

11,958 total SciPack final assessments finished to date. 7,449 passed.

### Force and Motion Assessment
- 1,626 Pre-tests taken with a 56% avg score
- 549 Post-tests taken with a 67% avg score

Totals as of 6/7/2012

### Energy Assessment
- 1,108 Pre-tests taken with a 66% avg score
- 373 Post-tests taken with a 78% avg score

Totals as of 6/7/2012

### Oceans Effect on Weather and Climate Assessment
- 653 Pre-tests taken with a 57% avg score
- 228 Post-tests taken with a 69% avg score

Totals as of 6/7/2012
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 July 2012

- See dozens of administrator, university, and teacher testimonials

http://learningcenter.nsta.org/impact/testimonials.aspx
University Pre-Service Models

- Florida International University
- Georgia Southern University
- Idaho State University
- Indiana University-Purdue University Columbus
- Mercer University
- Montana State University
- Plymouth State University
- Radford University
- Shippensburg University
- Southern Illinois University/Carbondale
- University of Maryland, Baltimore County
- University of Texas at Tyler
I am writing to praise NSTA for your creative efforts in providing online professional development resources for teachers and to let you know that at The University of Maryland, Baltimore Campus we are using the resources with our pre-service elementary science teachers to boost their content understandings and help them gain insights into high quality professional development. As the professor of the UMBC elementary science methods course and as a professional development researcher, my belief is that the day you decide to become a science teacher you start on your professional development journey. So, one of the main goals in my course is to help my pre-service teachers become aware of the resources that will serve them across their careers as life-long learners. The online professional development resources on the NSTA website are a perfect fit for helping us reach this goal. I encourage other university science educators to get their students involved in Learning Center activities. Our pre-service teachers deserve the opportunity to experience NSTA’s innovative, high quality, online professional development learning experiences as these are the types of activities they will be doing as practicing science teacher.

Susan M. Blunck, Ph.D.
Associate Clinical Professor
Science Education
Director UMBC Center for Excellence in STEM Education
Preservice Science Method Professor Testimonials

I utilize the NSTA Learning Center for my Pre-service Teachers enrolled in my science methods courses at The University of Texas-Tyler. I utilize the Learning Center because it is much more comprehensive than a methods text. The NSTA Learning Center allows me to develop (preload) a library of materials I can share with my students to serve as their text. It allows the students to build upon the library by adding their own resources as they learn about science teaching and learning. In the EC-6 and 4-8 grade level certification programs too many students do not have the content backgrounds they need in science. The Learning Center allows me to evaluate my students’ science content knowledge using the free PD Indexer tool and develop a remediation plan using SciPacks to address their gaps in knowledge. The best part is that students complete the modules outside of class rather than taking limited class time. Students also seem to like the SciGuides that are coupled with the SciPacks and Science Objects, as they provide vetted web-based resources, lesson plans, and access to the simulations found in the SciPacks for use in the classroom.

Michael Odell, Ph.D.
Roosth Chair in Education Executive Director, The Ingenuity Center University of Texas at Tyler

See dozens more: http://learningcenter.nsta.org/impact/
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/)
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)
It’s about varying the mix...

- Administrator acknowledgement, and recognition systems help to integrate online and onsite as single effort for your PLC’s.

- Mix various instructional strategies:
  - Case Study/Debates
  - Sharing Students Work/Products
  - Role Playing Scenarios
  - Collaborative Projects/Inquiries
  - Panel Discussions/Hot Polls
  - Smashing Sentences
  - Data Analysis/Visualizations
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Blending Online and Onsite Professional Development: Applying What the Research Says for Effective and Sustainable Learning Communities

Questions?
On the Horizon:
Teacher Learning Journeys!