Project Report: The Construction of the Teaching Resources Page for Greenseedling.com

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In Rethinking Science Literacy (2004) by Wolff-Michael Roth and Angela Calabrese Barton, Derek Hodson is quoted as saying that the ultimate purpose of education for scientific literacy is, "To produce activists: people who will fight for what is right, good, and just; people who will work to refashion society along more socially just lines; people who will work vigorously in the best interests of the biosphere." Greenseedling.com believes that plant science is for everyone, and in the effort to support awareness and appreciation of plant biology in K through 12 classrooms, provides resources to educators. Acknowledging that students, and often their teachers, find that plant science can feel overwhelmingly broad (and even boring) in the classroom, the goal of the Teacher Resources page is to help teachers find fun and creative ideas to implement in their curriculum that will encourage excitement and inquiry for teacher and pupil alike. The challenge that comes with this goal is two-fold:

- How can this web page be a useful tool that teachers will utilize, and
- How will this web page stand apart from other teaching resources?

How can the Teacher Resources page be a useful tool that teachers will utilize?

In order to address the first part of the challenge and have an idea of what teachers might be looking for, several teaching professionals from Texas, Oklahoma, and Colorado were asked what they would want in a science website. This feedback, though it was limited by a low response turnout, was a way to establish a starting point for further research and a sampling of their responses is described below:

Linda Lippe, Elementary Science Curriculum Coordinator for Leander Independent School District, said she looks for games students can access on the computer to play as a way to integrate technology in their learning. She has also searched for a time-laps video of a seed growing from both above-ground and below-ground perspectives. Linda shared that her district subscribes to the United Streaming program on discoveryeducation.com which offers videos teachers can use to supplement their lessons. An Elementary Science Specialist, Julia McComas, from the same district as Mrs. Lippe said that the teachers on her campuses are looking for interactive activities and quizzes and appreciate websites that offer more action and less words to have to sort through. She suggested that topics might include images that could be projected onto a screen from the computer, virtual field trips, background information for teachers to expand their knowledge, and hands-on activity ideas.

Stephen Friend, Science Materials Manager (K-12) for the Denver School District said that he would love to have a place to look up materials recommended for classroom use, tips on keeping plants alive in the classroom, and ideas for cleaning or recycling science materials in an eco-friendly way.

Tammy Parks, a Home-school teacher in Round Rock, Texas shared that she would love to have experiments or lessons with modifications for multiple levels (as she teaches

three different ages of children often on the same topic at the same time) and the ability to rank them and offer feedback to the site. She would love book recommendations, and worksheets with games to practice vocabulary or word banks with definitions.

Teachers use published standards and expectations for learning when planning their lessons, therefore two sets of standards for plant science education were consulted: those of the Texas Education Agency (www.tea.state.tx.us) and the National Science Teachers Association (www.nsta.org). The assumption is that if activities suggested by greenseedling.com already reflect these standards that are required, teachers will be more likely to use the supplements. In this, greenseedling.com also shows teachers a consideration and understanding for their expectations. When researching information on lesson supplements, if the content did not align with science standards, it was not included in the Teacher Resources page content for Greenseedling. These standards also gave structure to the format of how supplemental material would be offered by topic areas as the main headings.

How will this web page stand apart from other teaching resources?
To first address this question, other science websites were explored to see what they offered teachers in terms of plant science. Many offered ideas that fit into the mold that desired for Greenseedling, but perhaps did not include addressing teaching standards or hands-on activities and exploration, and almost none had creative critical thinking exercises that aid students in generative learning. Opportunities for teachers to build their networks as a community of practice also were not found on other websites. Web pages that were found most helpful and were implemented in the Teacher Resources page are cited sources, but primary inspiration came from www-saps.plantsci.cam.ac.uk/ and from www.aspb.org.

Considerations in page structure and content
To aid in creating structure and boundaries to the information being collected and chosen, a definition of this page's audience was created. Narrow scope allows for greater depth in the content offered, so the audience is solely teachers as opposed to teachers and students. This brought forth the question of whether or not professional development for teachers would be offered. Instead of offering intentional opportunities for professional development, teachers will be given background information to enhance and support the implementation of the activities given on this site, and on plant science in general. Greenseedling.com is not presuming that it can offer teachers development opportunities in pedagogy as the goal is to simply bring plant science to everyone. Along the same vein, new lesson plans in their entirety will not be written by the website (although other lesson plans might be included as links), and material will simply be offered to enhance and supplement what the teacher is already implementing in their classroom.

If complete lesson plans and professional development are not included, what should be included? With the understanding that a teacher's primary barriers are time constraints, integration of technology, literacy, or numeracy in science lessons allows teachers to "kill two birds with one stone." Ideas on how to integrate these are listed below. Creative critical thinking appeared to be missing from other sites, so including critical thinking

prompts for student journal writing or projects would be a unique aspect of Greenseedling.com. However other considerations arise from this, such as, how are the activities meant to supplement lesson plans to be structured on the site? How would teachers be able to efficiently navigate the items offered to find what they are looking for?

Finally, the page would be different from other science websites if it helps science teachers build a community of practice. Communities of practice (from *Communities of Practice: Learning, Meaning and Identity* by Etienne Wenger, Contributors Roy Pea and John Seely Brown. Published by Cambridge University Press, 1999, 336 pages. ISBN: 0521663636,9780521663632) – are defined as groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. These people (science teachers in this case) value their collective competence and learn from each other. They encourage in joint activities and discussions, help each other, and share information. They develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems, etc. One of the final structure considerations for the Teacher Resources page is how to address the potential need and benefit that K-12 science teachers would have for a community of practice that could be easily accessible through the site.

Addressing the considerations

A belief statement aids in guiding research, limiting what is chosen to add to the web page.

Belief Statement: If the Teacher Resources web page is relevant and simple, it will be utilized; if it is random and complex, it will not. If standards for content are high, utilization will also be high.

- Definition of *relevant* in this case: The material on the site will complement national standards for education. It will integrate literacy, numeracy, and technology in science, encourage inquiry, and incorporate many styles of creative thinking, problem solving, and hands-on explorations so that students claim their new knowledge as they discover it.
- Definition of *simple* in this case: Understanding that time is the teacher's primary enemy, the site will limit how many "clicks" it takes to get to certain pieces of information, and will clearly list and label the supplements that will enhance educational experiences. This is working from the assumption that if there are too many steps to take, perhaps none will be taken at all.

The search for relevant links and relationships to build with other websites created a way to see who was linking to whom on the web and what different sites had to offer and began with "Googling" plant science and specific content words, such as "photosynthesis." Pages and pages of resources were found, but required sifting through to find the quality experiences Greenseedling.com wants to offer. In searching for quality, the credibility of sources was researched, and information that was clear without a lot of "fluff" was preferred. Engaging exploration was chosen over memorization and lecture activities. Although not the sole consideration, the five E's are a good rule of thumb to follow in choosing activities: Engage, Explore, Explain, Elaborate, Evaluate.

Lessons with formative assessment built in are a plus for teachers who want to keep the pulse of the students in her class throughout the lesson. Generative lessons were also preferred. These lessons put the students in the driver's seat and allow them to take ownership of their learning with the teacher facilitating as a guide who knows how to ask the right kinds of questions.

Researched information that was chosen for the site was grouped into like categories based on content topic, and appropriate age ranges for students were noted for each idea or activity. Some ranges are larger than others, and many offer opportunities for modification for different ages and needs.

The vision for Teacher Resources is one of countless teachers from around the country using and interactive on the site - regularly engaging in discussions on the board, sharing ideas with one another, and giving each other and the website feedback on how things could be *even better!* Expansion in content areas would be fantastic – and this could grow based on the needs expressed by teachers who visit the site as they know what they need to teach and the areas they could use supplemental materials for. For example, new content areas might include life cycles (including growth and reproduction) of different types of plants, classroom recipes, taxonomic activities, and more! An expanded area for field trip ideas in the resources area would be unique, as would service project ideas that classes could take on in order to make the world a more plant-friendly place, such as an Adopt-a-Tree program, etc.

Example of email I sent to educators asking for feedback on web page example draft:

Dear friends,
I have been working on constructing the teaching page of the www.greenseedling.com webpage as my internship this semester. I contacted dozens of educators in several states to survey what they would find most useful in a website about plant biology for teachers. The result was to try to construct a place where teachers could to find and share ideas and information that would also follow the guidelines set by our science teaching standards. In the site, I am not presuming to write lesson plans, but to instead offer supplementary material and the opportunity for teachers to do "one-stop-shopping" when trying to find something to make teaching plant science fun.

I was hoping that now I could ask you for a few minutes of your time to review the outline I am attaching that is the bare bones of what the area might look like (without the cute graphics, etc.) and give me your feedback. Please let me know if there is a need for any clarification of something on the outline as well. And, of course, you are welcome to share it with a friend so they can check it out, too. :)

You may respond in whatever way you might like. Here are some questions to guide your response if you would like to use them:

Content:

What did you think of the areas that were included? (ie, literature suggestions, experiences, resources, discussion board, etc.) Were there any you would add? Were there any you don't think you would use?

Layout:
Does it look like the area will be easy to navigate? Might it be cluttered or uncluttered? Is the information clear?

Utilization:
Do you think you would access this site? Tell more about what makes it something you would use or not use.

I truly appreciate your help!
Best wishes,
Laura Sanders

{Following this in the report is the list of teaching resources you may find on www.greenseedling.com]