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Online to Learn or In Line with Standards? An Illusory Dilemma

by Judi Harris

An exceptionally creative and talented elementary school teacher told me a story recently that saddened, but did not surprise me. This teacher has been helping her students to use computers as learning tools in many ways and for many years. In particular, her students have been doing rich, multidisciplinary, curriculum-based telecollaborative and teleresearch projects for more than six years. Yet in May, this talented teacher's principal told her that the students in their school would "not be using the Internet" during the 2000-2001 school year because their low achievement test scores required more "concentrating on the basics."

Perhaps you, like me, are shaking your head now, perplexed by this all-too-familiar misconception that in-school use of the Internet (and even computers in general) by students is somehow an "add-on," an "extra," or even a "new curriculum." Combined with increasing pressure in many places for higher scores on standardized tests, we can understand why Internet-based work in the classroom can be seen as dispensable. In a recent article by Love & McVey (2000), this tension was described as:

> …additional demands associated with current standardized testing practices. Clearly, there is a need to document student learning and to hold schools accountable. However, the often unreasonable pressure of preparing children for statewide tests has led to some instructional choices that may be of questionable worth in terms of the children's long term educational attainment. (p. 2)

Though it's true that some Internet-enriched learning activities can seem disassociated from curriculum standards, we must remember that *tools don't constitute curriculum.* Rather, tools can be used in service of students' learning needs, and in powerful, curriculum-based ways.

Telecollaboration and Teleresearch

Internet-supported, curriculum-based learning can take many forms, but is essentially either *online collaboration,* also called "telecollaboration," or *online research,* also called "teleresearch." Telecollaborative learning activities are those in which students communicate electronically with others. Teleresearch learning activities are those in which students locate and use on-line information. Online collaboration and research are frequently combined in larger-scale educational projects. Both can be done using text, still images, animated images, and sound. Both are available in either synchronous (immediate) or asynchronous (delayed) modes. Both can reproduce what students already do when they collaborate and do research using earlier-vintage learning materials. Yet to make these new opportunities worth the time, effort, and other resources necessary to bring them into the classroom, it is important to use the new tools in new and powerful ways.

Collaborative online learning activities can offer many educational benefits to their participants. The nature of these benefits depends, in large part, upon the specifics of each activity's design, and how well what the activity makes possible educationally matches the needs and preferences of participating students. In general, curriculum-based telecollaboration is most appropriate when students can be well served by:

- Being exposed to multiple points of view, perspectives, beliefs, interpretations, and/or experiences.
- Comparing, contrasting, and/or combining similar information collected in dissimilar locations.
- Communicating with a real audience using written language.
- Expanding their global awareness.

Doing research online can offer an ever-expanding wealth and variety of current information to learners. Whether this abundance helps or hinders students' curriculum-based learning depends, like online collaboration, upon the activity's design, and also upon students' information-seeking and information-appraising skills. In general, curriculum-based teleresearch is most appropriate when students can be well served by:

- Accessing information not available locally.
- Viewing information in multiple formats (e.g., text, graphics, video).

- Comparing and contrasting differing information on the same topic.
- Considering emerging and very recent information (e.g., interim reports of research studies in progress).
- Delving deeply into a particular area of inquiry.

What kinds of learning activities can help students meet curriculum standards while incorporating telecollaboration and teleresearch in powerful ways? The scope and variety of curriculum-based telecomputing activities can be understood according to their structures and their purposes.

Activity Structures and Purposes

Activity structures are flexible frameworks that help teachers to efficiently and effectively create curriculum-based telecollaboration. They are a special type of thinking tool for teachers; a form of design assistance. They help us to capture what is essential about the structure of a learning activity, and communicate that in such a way as to encourage the creation--not replication--of context-appropriate environments for learning.

There are 18 telecollaborative activity structures that have been identified to date (Harris, 1998). The structures are grouped into three genres of online activity:

- *Interpersonal Exchanges* are those activities in which individuals talk electronically with other individuals, individuals talk with groups or groups talk with other groups.
- *Information Collection and Analysis* activities are those which involve students collecting, compiling, and comparing different types of interesting information.
- *Problem Solving* activities promote critical thinking, collaboration, and problem-based learning.

Curriculum-based teleresearch seems to be structured upon a different basis than curriculum-based telecollaboration. Teleresearch activities are differentiated upon their apparent learning *purposes* for students locating and using online information, rather than their structures. These six teleresearch purposes include:

• Practicing information-seeking and information-evaluating skills.
• Exploring a topic of inquiry or finding answers to a particular question.
• Reviewing multiple perspectives upon a topic.
• Collecting data.
• Assisting in authentic problem-solving.
• Publishing information syntheses or critiques for others to use in teleresearch.

More information about each of these structures and purposes, along with examples of classroom-tested, curriculum-based activities that illustrate them, can be found at *Virtual Architecture*'s (Harris, 1998) "Web Home:" http://ccwf.cc.utexas.edu/~jbharris/Virtual-Architecture/ . Please see especially the articles describing telecollaboration and teleresearch in terms of structures and purposes that can be downloaded from this page: http://ccwf.cc.utexas.edu/~jbharris/Virtual-Architecture/Foundation/index.html .

Time and Space

Have you noticed that the only time there seems to be a profusion of space in a house (or apartment, or classroom, or office) is when we first move in? Somehow, as the months pass, our roommates and possessions - or, perhaps, our expectations - multiply in such a way so that soon, we are feeling like we need more space again. As teachers, we face a similar situation with the biggest challenge to powerful educational use of the Internet: ***time***. Somehow, as the years pass, we realize that we must (often, we are required to) add more to what our students experience in our classrooms. Fortunately, Internet tools and resources are not (or, shall I say: *should not be*) additions to our curricula; rather, they can be used as "instruments of construction" in curriculum-based learning. So, at least theoretically, once we have developed the skills prerequisite to using Internetworked tools and resources effectively within the curriculum, going online as part of curriculum-based inquiry shouldn't take additional time or space.

Are some of you starting to smell snake oil after reading that last sentence? If you have used online facilities as part of your teaching already, does it seem that doing so took more, rather than less, time and energy? Part of this expenditure of precious resources may have to do with developing technical expertise, arranging network access, etc. Yet beyond that, it *does* seem that curriculum-based telecomputing projects take longer, doesn't it?

The reasons behind this relationship probably have more to do with the *types* of telecomputing projects that we see as worthwhile in terms of time, effort, and resources needed. Although I know of no research results that have reported this discovery, from talking with many telecomputing teachers and from being involved in many curriculum-based projects myself, I suspect that what we see as worthy projects are those that are more student-centered, active, problem-based, multi-modal, and interdisciplinary. Planning for and implementing rich educational experiences that can be described in these ways requires more time, more energy, and more resources than traditional, didactic, unimodal teaching. Use of the Internet isn't really what occupies more time and space in our schedules. Teaching well does.

Having asserted that, though, the very real limitations of curricular crowding and time shortage still need to be addressed. Unfortunately, unlike a family that may be able to move to a larger house when its members perceive a need for additional space, there's not much hope of any of us getting more space in our students' schedules. Might it be possible, then, for each project to effectively *combine* curricular goals, telecollaborative activity structures, and teleresearch purposes? Let's take a look at some example projects to see how it is done.

"Musical Plates"

Creators of the Musical Plates project < http://k12science.ati.stevens-tech.edu/curriculum/musicalplates/> at the Center for Improved Engineering and Science Education at the Stevens Institute of Technology and the Bank Street College of Education have created a multidisciplinary exploration of earthquakes and plate tectonics that helps secondary students learn actively in science, mathematics, language arts, and instructional technology. Students are introduced to this problem-based project by reading this story:

> You are the lead scientist in the United States Geological Survey (USGS) investigating earthquakes. You are currently sunning yourself on the shores of a remote Pacific island and enjoying the last few days of your first vacation in five years. Just as you to drift off in a pleasant daydream, you are rudely awakened by your cellular phone which is ringing loudly next to you on your beach towel. You pick up the phone and are shocked to hear the frantic voice of your secretary, Al, yelling that you must return as soon as

possible. He explains that the earthquake project that you have been working on has been accelerated by the President of the United States and that you need to begin your analysis immediately. The President wants to know where these "nasty little quakey things" are occurring and if there is any way to determine what parts of the world are most prone to them. If at all possible the President would also like to know what is causing the earthquakes and why. Unfortunately for you and your research team the President needs to have this information by the end of the week or he will cut all of your funding.

Realizing that your vacation has come to an end you jump up and quickly return to your oceanside hut. Your first instinct is to return to your office on the first plane leaving the island, but your hopes are quickly dashed after speaking to your husband. He informs you that the next plane isn't due to leave for another three days. At first you think all is lost until you remember that you have your laptop, cellular phone and modem with you! With these tools you can dial-up and begin your investigation from your beachside residence.

Your Assignment:

1. Pinpoint the exact locations of where recent earthquakes are occurring.
2. Determine if certain parts of the world tend to experience more earthquakes than others.
3. Determine what is causing the earthquakes.

(http://k12science.ati.stevens-tech.edu/curriculum/musicalplates/story.html)

Students then use real-time earthquake and volcano data, accessed via the Internet, to respond to the "President's assignment." In addition, they assert data-based hypotheses about how earthquakes and volcanic eruptions affect the plants and animals in differing natural habitats, and how local, national, and global human communities respond to such natural events. Participants are encouraged to publish their work online at the site for others to use.

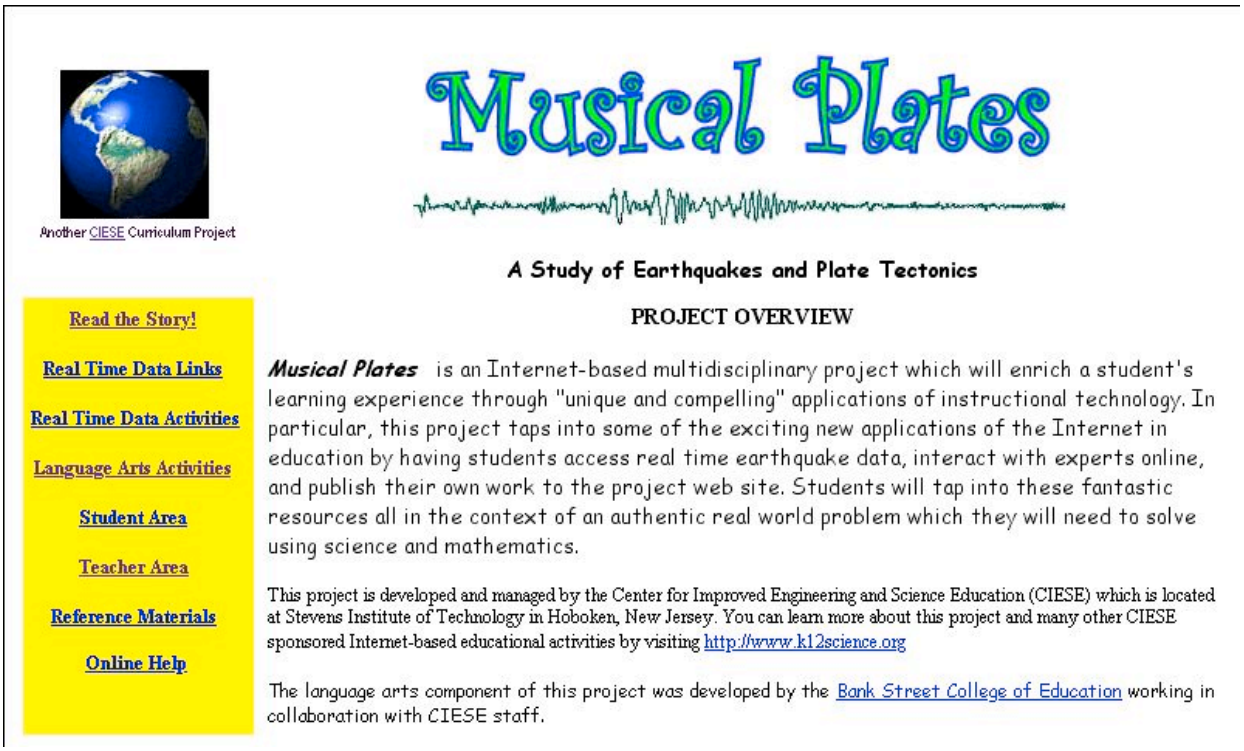
Seen from a design standpoint, this rich project affords students engaging opportunities to do teleresearch for all six purposes listed above. More importantly, seen through a lens focused upon curriculum standards, students

participating in this project satisfy multiple requirements in each of four curriculum areas. The project's creators have cited these specifically according to two national, five state, and one local sets of standards. For example, the New Jersey Core Curriculum Content Standards that students satisfy by participating fully in the Musical Plates project include:

> 3.2: All students will actively listen in a variety of situations in order to receive, interpret, evaluate, and respond to information obtained from a variety of sources.
> 3.3: All students will compose texts that are diverse in content and form for different audiences for real and varied purposes.
> 3.5: All students will view, understand, and use nontextual visual information and representations for critical comparison, analysis, and evaluation.
>
> 4.9: All Students Will Develop an Understanding of and Will Use Measurement to Describe and Analyze Phenomena.
> 4.11: All Students Will Develop an Understanding of Patterns, Relationships, and Functions and Will Use Them to Represent and Explain Real-World Phenomena.
>
> 5.2: All Students Will Develop Problem-Solving, Decision-Making and Inquiry Skills, Reflected by Formulating Usable Questions and Hypotheses, Planning Experiments, Conducting Systematic Observations, Interpreting and Analyzing Data, Drawing
> Conclusions, and Communicating Results.
> 5.4: All Students Will Develop an Understanding of Technology as an Application of Scientific Principles
> 5.10: All Students Will Gain An Understanding Of The Structure, Dynamics, And Geophysical Systems Of The Earth.
>
> 6.1: All students will learn democratic citizenship and how to participate in the constitutional system of government.
> 6.4: All students will acquire historical understanding of societal ideas and forces throughout the world.
> 6.9: All students will acquire geographical understanding by studying the environment and society.
>
> Standard 2: All students will use technology, information and other tools.

Standard 3: All students will use critical thinking, decision-making, and problem-solving skills.

(http://k12science.ati.stevens-tech.edu/curriculum/musicalplates/standards.html)



"Advocates for the Millennium"

This imaginative five-week project < http://www.angelfire.com/mi/llennium3/> from Alberta, Canada helps students in grades 3 through 9 explore ideas related to millennia through work in language arts, social studies, and information and communication technology. Much of this project is telecollaborative; students engage in activities structured as global classrooms, keypal exchanges, telementoring, information exchanges, and electronic publishing. Teleresearch is used to help students explore millennium-related topics from multiple points of view.

The project, now in its third year, adopts a new theme annually, but is scheduled similarly each time. During the spring of 2000, for example, the project commemorated the International Year of the Older Person with the following activities:

Week One: Introduction to the Millennium

- Classes participating in all five weeks will be partnered for the global classroom experience.
- Email introductions are made to keypal.
- Introductions to Adopt-a-Grandparent - Ties in with the International Year of the Older Person
- View a list of SeniorNet Volunteers here!

Week Two: The Past

- Research an important person of the last 1000 years.
  Research is placed on a circle which will go on a 1000 year timeline.

Week Three: The Present

- Students record the stories of their own grandparents or a grandparent they have adopted.
- Students complete PowerPoint presentations on the Millennium

Week Four: The Future

- Futuristic poetry, predictions stories and descriptive writing. What will the future look like? Where will you be? What does a car or a house of the future look like? Be creative!

Week Five: Wrap Up

- The end of another Phase of the Advocates for the Millennium. See you next year in Phase three - - Advocates for the *New* Millennium!
  (http://www.angelfire.com/mi/llennium3/)

Provincial and national curriculum standards that the project satisfies are quoted, by grade level and discipline, at the project's site: <http://www.angelfire.com/mi/llennium3/lacurobj.html>. For students in grade 8, for example, 14 language arts, 19 information and communication technology, and more than 50 social studies standards are addressed in the context of just this one rich project.

"Fairytale CyberDictionary"

In this simple, yet powerful project for very young students < http://www.op97.k12.il.us/ftcyber/index.html>, each participating teacher chooses a familiar fairy tale to read aloud to their class. As a group, the students are then challenged to retell the story in their own words and with their own artwork, either writing or dictating their version of the tale, then illustrating it. There's a clever challenge in this particular project's design: in retelling the fairytale, students are asked to choose and include words beginning with each letter of the alphabet that communicate important aspects of the story.

For example, when kindergarten students in Kapa'a Elementary School in Kapa'a Kauai, Hawaii retold the story of "Jack and the Beanstalk," they said:

> Jack and the Beanstalk
>
> Jack traded his cow for five magic beans. Jack's mother threw the magic beans out the window. The vine grew. Jack looked out the window and he saw a giant beanstalk. Jack was excited when he saw the beanstalk. The beanstalk grew and grew and grew. Jack went up the beanstalk.

Jack climbed the beanstalk. Jack climbed the beanstalk and saw a castle. Jack sneaked into the castle. The giant's wife gave Jack some breakfast in the kitchen.

The castle door slammed. Jack went in the oven. Jack hid in the oven.

The giant was eating at the table. The harp played beautiful music with no one playing it. The giant told the hen to lay a golden egg. The hen laid magic, golden eggs.

The giant took a nap and his snores shook the castle. The giant snored, "zzzzzzzzzzz."

Jack stole the giant's gold. Jack told the chickens to be quiet. The giant yelled at Jack.

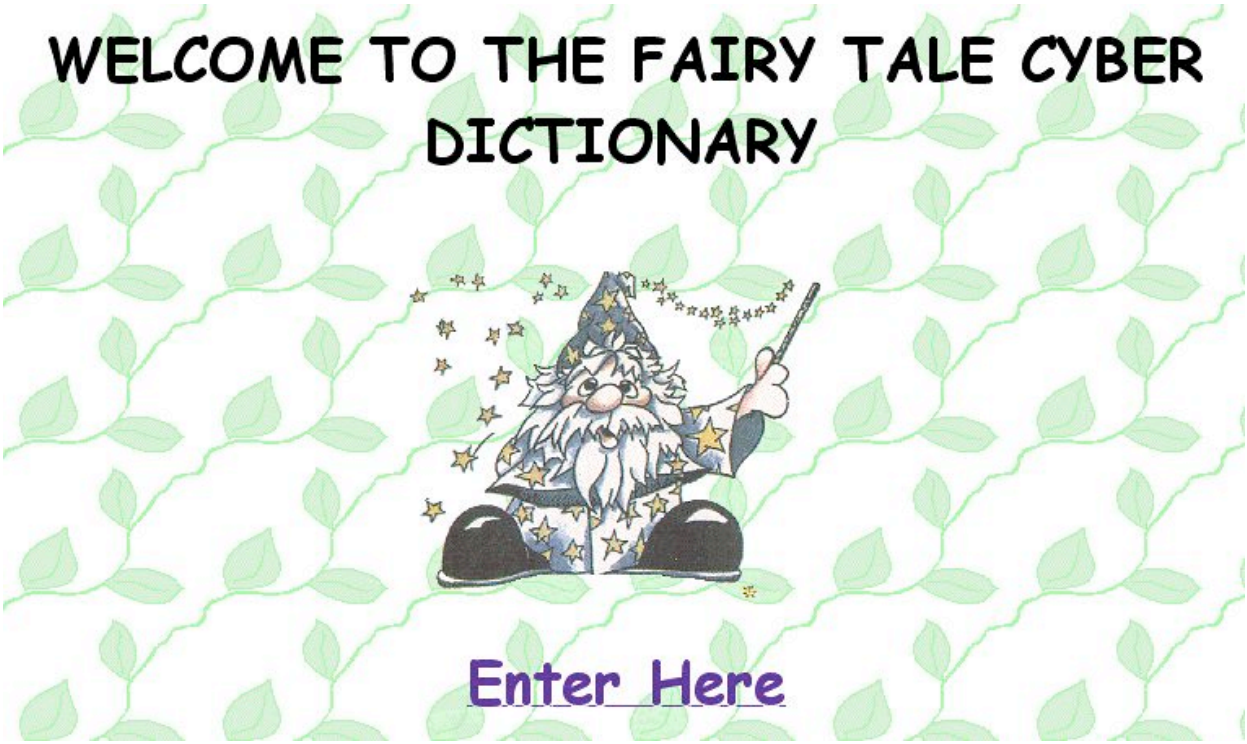
Jack ran to the beanstalk. Jack chopped down the beanstalk with his ax.

Jack married the princess.

http://www.op97.k12.il.us/ftcyber/jack/index.html

Participating classes' CyberDictionary versions of the fairytales are posted at the project's site for all to enjoy. Although it was not described in the posted plans for the project, I suspect that students visiting this cybercollection use the student-written and -illustrated tales offered there to review alphabet and spelling skills.

As you can see, students participating in this project are addressing curriculum-required learning involving listening comprehension, word analysis skills, preliminary spelling skills, memory-building, sequencing, linguistic problem-solving, and graphic expression. The Fairytale CyberDictionary project demonstrates that multiple curriculum standards can be addressed even in short-term projects with the simplest of designs.



What Dilemma?

The point, I hope, is clear: participating in one well-designed project can help students address many content and process standards at the same time, and in engaging, pedagogically sound ways. Although there is yet no generalizable evidence that doing so will also help to improve standardized test scores, it would serve to reason that *if the testing instruments are reliable, valid, and matched to relevant curriculum standards,* the benefits of such project-based learning should also be reflected in higher test scores. If they aren't, perhaps we should question the *tests* before we question the ways in which creative teachers are helping their students to learn. Use of Internet-based tools and resources in curriculum-based ways can not only directly address curriculum standards; it can do so in a time-efficient and learner-centered way.

References

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Love, R., & McVey, M. (June 21, 2000). Teachers' use of the Internet. *Teachers College Record* [On-line], ID Number: 10538. Available: http://www.tcrecord.org/printidkwparam.asp?@IdNumber=10538