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It's a Simple Idea, But It's Not Easy to Do: Practical Lessons in Telementoring

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There are now more than 42 million people worldwide with access to global electronic mail. Many of these millions are subject matter specialists whose knowledge encompasses a wide spectrum of expertise. What if "matches" could be made so that volunteers from among this group could communicate directly with K-12 students and teachers who are studying about these experts' specialties?

There are a few online efforts that bring people together in this way. One, the *Electronic Emissary Project*, is an Internet-based interpersonal resource that has been in operation since February of 1993. It is global in scope, but is coordinated from the University of Texas at Austin, and is funded by both the Texas Center for Educational Technology and the JC Penney Corporation. The Emissary is a "matching service" that helps teachers with access to electronic mail locate other Internet account-holders who are experts in different disciplines, for purposes of setting up curriculum-based, electronic exchanges among the teachers, their students, and the experts. In this way, the interaction that occurs among teachers and students face-to-face in the classroom is supplemented and extended by exchanges that occur among teachers, students, and experts asynchronously via electronic mail. The Emissary is also a research project, which has as its focus exploring the nature of adult-child, text-based interaction in which students are active inquirers.

Sample Teams' Work

Here are some examples of recent curriculum-related work conducted via Emissary-arranged "matches:"

- High school students in Delaware who were studying Nathaniel Hawthorne's *The Scarlet Letter* communicated with the character Arthur Dimsdale, who was actually an American literature professor at the U.S. Naval Academy. During the following semester, the students communicated with the professor himself about Mark Twain's *Huck Finn*, culminating their exchange by creating a newspaper that they called *The Mississippi Times*, an idea first suggested by the expert. The teacher and the professor shared instructional ideas, resources, and perspectives about Mark Twain's works and views.
- Students in the "upper room" of a country school in a rural and mountainous region of northern California (11 students, ranging from 4th to 8th grade in the same classroom) learned about bones and skeletons by studying their own skeletal systems and the bones found in owl pellets in the woods near their school. Their teacher, along with a biological researcher at Michigan State University, guided the students' hypothesis formation and testing as they extracted the bones from the pellets, measured them, labelled them, then reconstructed the skeletons, and deduced what kinds of animals the bones supported.

- Approximately 30 high school juniors and seniors in New York City worked with their teacher to produce World Wide Web-based resumes. A multimedia specialist from Purdue University provided technical assistance and detailed feedback on page design and content for each student.
- 19 4th- and 5th-grade students in McAllen, Texas compared the experiences of their families on the Texas "La Frontera" to colonial life in the original 13 U.S. colonies, with the help of the director of a historic preservation center and museum in Fredericksburg, Virginia.
- Eight groups of four girls each, who were studying in an honors science program at a New England high school, communicated with a graduate student at the University of Minnesota about DNA and infantile leukemia (the topic of the subject matter expert's thesis), cancer research and therapy and professional careers for women in science. The teams discussed both scientific and ethical issues online with the university-based genetics expert.
- A computer scientist at the State University of New York-Potsdam with interest and expertise in American history posed as a young Union soldier to help gifted and talented fifth-grade students in Omaha, Nebraska learn about the Civil War. He answered the students' questions in character. The students used what they learned from his responses to write a play about the Civil War, which was performed at their school early in 1996.

The obvious breadth, depth and variety of these exchanges are a testament to the potential power of telementorships. But does a simple, yet powerful idea imply a straightforward implementation strategy?

It's Not as Easy as You Think

"This is easy!" you might be thinking now. "Just give people each others' Internet addresses and a few suggestions about netiquette, and the conversations are sure to be successful!"

That's what we thought and had expected, also, nearly four years ago, during the pilot phase of the project. We assumed that if folks already knew how to use electronic mail and wanted to communicate with each other, all that we needed to do was to act as a virtual introductions service. We were wrong. We had overlooked the very real challenges of time, medium, and differing expectations. We quickly discovered the critical need and important role for the *online facilitator*.

The Medium

Communication by electronic mail is different from most other forms of interchange in significant ways. It is asynchronous, primarily text-based, and relatively fast, with participants often widely geographically distributed. It lacks the full spectrum of visual and audible information that we depend upon, often unconsciously, in face-to-face exchange. Therefore, it requires somewhat different interaction strategies if it is to be used to create maximal educational benefit by and for students and teachers. These techniques can be directly suggested by someone closely following the online conversations as a facilitator, helping participants to construct the teaching/learning experience in mutually beneficial ways. Our Emissary work has led us to recognize that the people best prepared to do this are those having the requisite experience in both Internet-

based communication and education to know how to help project participants build mutually accessible bridges between their differing workplaces.

Differing Expectations

The contexts in which subject matter experts (“SMEs”) work are quite different from most K-12 teaching/learning environments. Of particular note are differences in Internet accessibility, and the expectations that these contrasts can create. Most subject matter experts have easy and frequent access to telecomputing tools throughout their workday, and are accustomed to having brief, multi-turn, text-based conversations with colleagues with quick turnaround times. K-12 students and teachers have much less frequent and much more inconvenient access to telecommunications facilities. Whereas a SME might expect a reply to an e-mail message within 24 hours, many K-12 students are able to use Internet facilities only once weekly.

An elementary school teacher from southern California commented upon the differences in access between her classroom and the working environment of her SME, an environmental consultant working in Boulder, Colorado, by saying:

Lesson to be learned: maybe I shouldn't try to do any tech hookups until the school is properly wired; this seems to be too burdensome on those of you who have more constant access. I was hoping that it would be meaningful to the kids, but it seems to be pretty hard for them to really feel the power...The advancement of video technology seems to make the kids impatient and demanding.

The online facilitator for this team replied, in part:

No, not *burdensome* on us who have more constant access. We just wonder whether everything's OK with you and the kids.

The SME quickly responded:

Burdensome....?

Not at all! We just like these exchanges, and miss them when they're gone.

Other volunteer experts for the project have expressed similar sentiments. We found that it is sometimes necessary for online facilitators to do some “contextual translation” for the people working both inside and outside the K-12 classroom, so that adjustments to expectations for amount, frequency, and types of communication can be made to fit the realities of both working environments.

Too Much to Do in Too Little Time

Lack of time is a challenge common to workers in both classroom and non-classroom environments, although the logistical nature of time considerations in K-12 spaces is often foreign to those working in other contexts. A scientist from Idaho, for example, became frustrated and eventually offended when his multiple messages to a Texas science teacher and her students were not answered for several weeks. In communicating with the facilitator, he said:

I think the Electronic Emissary project is a good one and would be willing to take part in it further *if* whatever groups I am expected to interact with in the future clearly understand that common courtesy is expected of them. Obviously, the primary aspects of that courtesy...in this case is the requirement that all parties be notified if there is no desire to continue with the project, a clear statement of why such discontinuation is to occur and a specific termination date to be identified.

The facilitator for this team repeatedly attempted to contact the teacher by telephone and via electronic mail to see if there was some assistance that she needed. After more than a month, the teacher was finally able to get online, and wrote to the expert and the facilitator, saying:

I apologize for the long delay. I have not meant to be rude but have had a very difficult month with extremely pressing duties and have not even checked my e-mail for several weeks.

I have suggested to the students multiple times that they send a message and it was always something they were going to get around to (but didn't) before the bell rang. They are working on the experiment but have had many setbacks and delays. At the end of February we were waiting for our microcentrifuge. When it finally arrived it was Spring Break. They have been working on the plasmid extraction since then as their other duties allow. I guess they were trying to wait until they had news to report.

We will continue our work and really appreciate all of your early help...It did help the students to focus on what they were doing.

Timing considerations probably present the most difficult challenge to creating logistically workable electronic partnerships between people inside and outside of the K-12 school. As a high school earth science teacher in New Jersey wrote to the meteorology expert who had been communicating with his students,

You also need to be aware that teachers in public schools have to devote at least 15-20% of each day to *useless* pursuits, such as watching the kids eat lunch, or standing in a hallway, or helping kids to sign into bathrooms. Bear in mind that these kids are 1-3 years away from college or the armed services!

Of course, this is on a "normal" day, one where there are no field trips or assemblies. On those days (about 20% of the time) you might not even see your students! Amazingly, education still occurs and students still participate in projects such as this one!

...We are still years away from truly treating teachers as professionals by eliminating useless duties and giving them time to pursue academic issues and projects such as this one!

The online facilitator can help people using the same communications medium, yet working in different contexts with drastically different schedules, to understand and accommodate each other. The same ideas that guide a facilitator's actions in this endeavor can help electronic project partners to collaborate more effectively, even if facilitation services are not directly available.

It Gets Easier When You Remember to...

How can we help electronic team members make the most of each “match?” The eight online aides who have worked with more than 300 Emissary-supported electronic teams suggest the following guidelines for setting up and participating in successful project-based telementoring.

Before Mentoring Begins...

Most of our facilitators’ time is spent helping teachers and students to plan their projects with realistic expectations and an eye toward best use of limited interaction time and seemingly unlimited content expertise. They stress the need for:

- Clearly-conceived learning goals for the telementoring project.
- Careful, thorough planning of the operational details of the project, including a strong subtask structure agreed upon *before* content-related communications begin.
- Realistic and explicitly-stated time and communications frequency estimates.

A middle school science teacher from the Rio Grande Valley in Texas showed his understanding of the need for detail and serious forethought in his explanation of the project that he proposed to his chosen SME, a researcher from southern California. Here are some excerpts from his initial project description:

It is our goal to use our studies each year to contribute to an annual “state-of-the-Valley” environmental database, focusing on our section of the Rio Grande watershed and the Gulf of Mexico...

We make field trips to riparian habitats and to the coast several times during our course. In the spring, we go on board the R/V Katy from the [university in a port town] to gather water quality data and specimens... Throughout the year we monitor water quality in...a stream two miles south of our school. We monitor burns and ashfalls during cane harvest.

A SME would be both a resource and a referee for us, keeping us on the scientific “straight and narrow” and providing guidance and expertise, especially in communicating/ publishing the results of our work.

Our facilitators have noticed that those teachers who have thought carefully about roles and activities for themselves, their students, and the SME, and communicate these expectations in a flexible way, create a kind of collaboration that allows both adults to share instructional/ facilitative roles in students’ inquiry-based learning.

During the Exchange...

Our facilitators have also noted that exchanges displaying more of the following actions and attitudes seem to be perceived by participants as most successful.

- Off-line assistance for students, helping them to *plan* for communications with the SME before composing messages
- Regular “rhythm” of message traffic; short enough turnaround time to maintain a bilateral flow of electronic conversation

- Active, inquiry-based and student-centered communications (It is easy for adults to dominate the interactions, since they often have easier and more frequent access to Internet tools than students do.)
- Multidimensional communication, utilizing intellect and emotion, balancing scholastic and personal information shared in the exchange

We have found the last point to be a particularly important one. The exchanges that are perceived to be the most successful are those in which the participants know each other as multidimensional *people*, as well as intellectual compadres. The facilitators can model this very human kind of self-disclosure in their messages, and this can encourage similar action among students, teachers, and SMEs. One particularly communicative multimedia expert from San Francisco showed a good example of this kind of holistic sharing of self in text by writing an introduction that included the following:

Am a combination of things (who isn't?) and scrape a living doing the dull ones (like dum-dum typing) while finding fun and excitement doing the following, from time to time:

Actor (movies and TV, mostly extra work in the background), writer (tons of articles that never get on paper but go out into cyberspace), sculptor (done several portrait heads) and grandfather (five grandchildren of college age, more or less)...

Guess that's enough. Oh, yes, I am 74 years old, and I well can remember when Franklin Roosevelt was elected president, when Lindy flew the Atlantic (1927) and the Depression years (1930-1939). Plus World War II (was in England and France) and the Tucker Torpedo automobile, the great postwar bonanza that fizzled after making only about 12 cars.

(We at the Emissary remind ourselves many times each semester how *very* fortunate we are to be assisting such talented, altruistic, interesting and interested participants!)

When a balance between personal and professional information shared is not struck, students can "forget" that the SME is actually a person. As an elementary-level teacher commented in her evaluation of her experience of the project,

...the source for [the students'] discovery is a real person who knows an awful lot about what [the students] are supposed to be learning about -- but the information is coming to them in clumps. There is also the disadvantage that communication is written -- they many be talking to a real live flesh and blood person, but the words are all on a screen and there is no realtime contact. The same level of contact and exchange obviously could not be done with a textbook or even a CD-ROM encyclopedia (assuming the depth of knowledge being brought to them existed in a CD-ROM encyclopedia) but elementary school children do not always make this connection.

This personal connection is very important, as a middle school teacher in Massachussets explained to a university-based economist in the same state.

Really, what I have in mind when my students e-mail you is to demonstrate to them the power of e-mail to connect people. They will

probably be sending you some questions today. [Web pages] are wonderful sources of information and data--which is part of the reason we do not use textbooks. What is missing from them is direct, personal connection. While [the pages] often provide e-mail numbers there is no guarantee that there will be a response, or a worthy response.

Our facilitators have also found that SMEs, who often do not have K-12 teaching experience, find it very helpful to receive information about and suggestions for working with the students with whom they are communicating online. One well-meaning physicist in Ohio, for example, didn't realize that his explanations of astronomical phenomena were too high-level for his elementary audience until the team's facilitator brought the point to his attention. He also didn't realize that when 10-year-olds send individually-authored questions, they may take offense if some students' queries are addressed, and others are not. The facilitator gently helped the SME to understand this by saying:

10-year-olds crave personal attention, especially from an "outsider" whom they view as a hero. A pat on the back or an acknowledgement such as "thanks," or "interesting," or "tell me more about that," even when a question was not directly asked, would probably have made these kids' day. As it stood, [the teacher] probably read all the replies to the whole class, and some of the kids felt superior because you had addressed them directly, whereas others felt ignored.

Responding to the facilitator's feedback, the subject matter expert humbly suggested,

[Let's] keep it going for a while longer. I will try to lower the level of my explanations to that of the students. This will necessarily be a matter of trial and error. I learn pretty well from my mistakes.

It seems that in telementoring situations, *everyone* actively participating receives something of value. A medieval scholar at Yale University wrote, for example,

Thank you for the opportunity to participate once again in the Electronic Emissary Program. It was a pleasure working with the students, and I found it both helpful and encouraging to communicate with my future students while they were still in their formative yeears. Some of their questions showed a curiosity and sophistication which unfortunately seems to vanish by the time they make it to college! I regularly showed their questions to my colleagues in different departments here (whose help I often received in formulating a reply, and from whom I steal all the credit ;^)) and they were frequently impressed that their own research interests were mirrored in the students' questions.

Students and teachers of the Information Age need to be able to make connections outside the geographic and temporal bounds of their communities. Their mentors should include subject matter and pedagogical experts from both down the hall and around the globe. The *Electronic Emissary* is an effort that assists teachers and learners in addressing these needs and that vision. Although bringing people together for purposes of telecollaboration can be a challenging endeavor, the benefits for everyone involved far outweigh the inconveniences and miscommunications encountered. We at the *Emissary* will continue to bring mentors virtually to K-12 classrooms, learning from the challenges that such service engenders, and sharing our realizations with interested others.

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NOTE: More information about the Electronic Emissary Project is available online at: **<http://www.tapr.org/emissary/>**