Social activity in educational digital libraries: community, tools, and resources for learning
Interim Report to the CILT seed grant program, Community Tools Theme
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The study of social activity is being carried out at three online sites, The Math Forum, Tapped In and CILTKN. We plan to construct a web site that documents user activities in these three sites, and lists activity structures generated from our analyses of these studies. We envision that other researchers and practitioners in online learning will contribute to the construction of this site, resulting in a growing digital library devoted to the study of social activity in online environments.

PROJECT SUMMARY
The project had three goals; 1) to begin to theorize the notion of activity structure within the educational digital library environment and then to map out a research plan for studying activity structures, 2) to begin a conversation with other collaborators about activity structures in the educational digital library so that more work can be done across a range of educational digital libraries and to create a context where that work can be shared, and 3) to begin a pilot analysis in three educational digital libraries.

Since the initiation of funding, the research team began to work on the first goal remotely sharing information with each other through email and conference calls. We met in July at Swarthmore College for three days to finish goal one, make plans for a workshop at ICLS to meet goal number two and map out the research design for goal number three.

The July meeting was very successful. Our efforts to theorize activity structures led to a set of driving questions for the research. Our effort to think about activity structures as a set of relationships between the social system (school, workplace, Internet and computer affordances, etc.) and the individual's activity led to some specific questions we realized we needed to asks such as: How do things get adopted? How does site contribute to adoption? What do you pick up from the net? What makes you pick things up? Do you pick up things you don't use? Are their other things you still get from these things? A prior study done by Mimi Recker addressed some of these questions. She found these questions intersected with teachers in terms of how flexible, competent and sophisticated

they are as well as with the philosophy of teacher, and how many years a teacher has been teaching. Our work will build on these insights.

Our work in Swarthmore also led to a specific set of question about what the participant activity structure are. A related set of research questions we developed are: What are the different types of users? What else are the users doing online at other sites? What are the resource reuse issues? What are teachers taking away from the site? How are they using it? Are they using it? What are users doing compared with what users think they are doing, and how has that changed over time? Why do users want to do what they are doing? Why is the system the way it is (both in terms of the educational website and the school context)? What other constraints are there on both the website and the school?

The specific design of our pilot study that grew out of the July meeting in Swarthmore called for collecting data about user activities and the affordances and constraints they experienced at a number of different levels. We made plans to do a Log files analysis, a discourse analysis of archived conversations from a sample of the logs and archives of each site. An interview protocol design was begun so that we could interview key staff at each of the three sites as well as 48 teachers (16 from each site). We also began to design a set of online questionnaires for each of the three sites to get at information from teachers, other professionals using the site and at the Math Forum student users of the site. Finally we planned some virtual ethnography where we would hang out at each site for a period of a couple weeks to get a sense of the flow of user activities.

Finally at the July meeting we began to brainstorm a list of user activities based on prior research at the three sites and our experience as users of these sites. We began planning for a workshop at ICLS where we could share our work on user activities and encourage collaborators to add to our list of user activities and encourage future collaboration.

After the July meeting in Swarthmore the team began remote planning of the ICLS workshop in October. We met again at ICLS in Seattle Washington and the workshop was a big success. While the number of participants was small, each came with information about an educational digital library and we worked together to brainstorm a new and elaborated user activity list from which to begin our research. The workshop participants all expressed interest in following our research and they hoped to use this work to think more about user activities in their own sites. The research team also took advantage of being together at ICLS to refine research design, and to continue to work on the questionnaires and the interview protocol. The remainder of the fall went into finish the research instruments and putting together the research package for submission to Drexel's IRB. While that package was ready in late November because of holiday schedules it didn't get on the IRB's docket until mid-December. We just received IRB approval pending some changes on January 23 and we expect to be collecting data shortly.

RESULTS AND IMPLICATIONS

Thus far the research has generated a very robust activity list (see Appendix A). We have used this activity list to help shape the questions in the questionnaires as well as the questions for the interviews. The more in depth material we expect back from this research should allow us to construct a much more sophisticated model of activity structures which should be very helpful for educational digital libraries as they continue to think about the design of their services. This work we hope will also generate in interest in looking at user activities more systematically. Our team also plans to do follow up research from this project to look more systematically at user activities.

The research has generated more collaborators through the ICLS workshop. It is hoped that these collaborators will work with us, and each other, to continue to look at user activity structures.

Because of the time needed to design the work and the relatively lengthy process getting though the university IRB the project will go over the funding dates and therefore we request additional time to complete the research. We expect to have the questionnaire and log file data collected by end of February and the interview, discourse analysis and ethnographic data collected by the end of March. This will allow us to analyze and make a preliminary report of the data at AERA in April. It is also planned that two articles from the research will be written over the summer and submitted for publication by September.

LESSONS LEARNED: COLLABORATION
The collaboration has been remarkably fruitful. The different expertise brought by each of the PIs has yielded a lot of important theoretical work and some great opportunities to collect, analyze and triangulate a diverse set of data. The research design and instruments themselves are an important set of results to come out of this collaboration. Further the expansion of the collaboration at ICLS has important implications for continuing work in this area.

One of the main difficulties in collaboration has been the time it has taken to develop the research and get through IRB approval. The design of the project is a fairly complex one and so it is not surprising that this has taken some time to develop. It should be noted that the IRB is still an outstanding issue and we are still trying to figure out with them how to do an online survey with the students who use The Math Forum site. Human subject research is at a complex juncture nationwide and the responses of different university IRBs have significant implications for the future of online research looking at user activity.

NEXT STEPS
We are very excited about the future work that will grow out of this research. As mentioned about two publications are planned to more widely disseminate the results of this research. The research team also plans to expand this work into a full analysis of user activities at the three sites as well as including other educational digital libraries in a

more expanded version of the research. We intend to apply for an NSDL grant later this year in the targeted research track and/or perhaps a ROLE grant. Further it is our hope that the data we begin on user activities will become part of a larger database that other researcher contribute to that will allow online educational sites to provide better and more usable resources and services to their participant base.

Appendix A: User Activities

contribute resources
find resources
Explore available resources
find a group
find a mentor
find colleagues
find expertise
see what others are up to

explore as an example of an educational
web site
browse
Find out what this site is about
Find out if the site can be useful
Figure out how to navigate the site

participate in a discussion
Find a discussion,
follow a discussion
conduct/participate in a group discussion

to ask a question
Refine a question
find an answer

Use site to get additional information
using a site to compare information
Get help to do something on your own

contribute expertise
plan a lesson
Archive material

attend a meeting
conduct/participate in a class
Identify with group
talk with others
Make connections with other people
share your experience
Express frustration
seek emotional support
share your own expertise

Use in background of other work
Required assignment
for recreation

other purposes: please list