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Task Stream as a Web 2.0 Tool for Interactive Communication in Teacher Education

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This paper discusses the use of Task Stream software, referred to by its designers as 'Tools of Engagement,' for enhancing faculty-student and faculty-faculty communications within a school of education. The paper shows how the software can be used as a Web 2.0 technology to engage students (prospective teachers) as well as faculty (teacher educators) into conversations in multiple contexts of learning and development. Such uses go beyond the original design purposes of Task Stream as an electronic portfolio assessment system. This extension of use supports the notion of finding educational applications of available tools in ways that were not anticipated by the tool developers.

Keywords: Web 2.0 technology, Task Stream, Discussion board, cognition, communication, socio-cultural issues, community of practice, professional development

INTRODUCTION

In response to the need to renew accreditation by the National Council for Accreditation of Teacher Education, the teacher education unit at SUNY Potsdam in 2005 adopted a new system, Task Stream (*www.taskstream.com*), to manage its electronic portfolio assessment program. All teacher candidates are expected to subscribe to Task Stream and unit faculty are provided access. On the SUNY Potsdam campus the volume of the user community is quite large as close to 40% of the student body are prospective teachers. Typically, the software is used within teacher education programs as a web-based repository of student work (artifacts) along with faculty evaluation of those artifacts. However, with the increased awareness of Web 2.0 technologies in

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educational settings, the potential of using this available web system as a platform (O'Reilly, 2005) for enhancing faculty-student (e.g., within a course) and faculty-faculty (e.g., within a professional seminar) communication and collaboration became apparent. This paper shares the authors' experiences in using Task Stream as a Web 2.0 technology that may be useful to faculty in other teacher education institutions.

Widely used within teacher preparation programs, Task Stream is a web-based platform that includes two major modules. The first is the Accountability Management System (AMS), a resource hub that supports collaborative institutional assessment efforts. (This paper will not focus on the features of the AMS). The second module is the set of Learning Achievement Tools (LAT), which consists of a number of customizable web-based software applications for documenting, assessing, and improving student performance. The LAT includes such tools as Web Folio Builder, Unit and Lesson Plan Builders, Discussion Board, and Message Center. There is a value in extending the use of these tools by faculty for ongoing professional development; in particular, for soliciting peer feedback on various academic activities. In that way, Task Stream satisfies such central principles for Web 2.0 technology as "The Web as Platform" and "Harnessing Collective Intelligence" (O'Reilly, 2005).

One might argue that the use of an application that people are required to subscribe to may not be compatible with the notion of Web 2.0 technology. However, any use of a Web 2.0 application in education will be limited to some extent to a defined community of learners united by a common goal, be it a course or seminar. Furthermore, it is generally understood that no commonly accepted definition of Web 2.0 phenomenon exists. However, as Wang and Beasley (2008) recently stated, one clear criterion is "that every user has the clear potential to be not only a recipient but a contributor" (p. 78). The use of Task Stream does satisfy this criterion for the users within an education community as it supports user-contributed content.

There is almost no literature on the use of Task Stream as a Web 2.0 technology in teacher education. Currently, Task Stream is predominantly used as an electronic portfolio assessment management system. There is work on extending the electronic portfolio component of Task Stream to incorporate such Web 2.0 tools as blogs, Wikis, social networking and media and link sharing (Barrett, 2006; Barrett, 2007, Wang & Beasley, 2008). However, there is little work (if any) on developing the potential of using the Task Stream system itself as a Web 2.0 technology.

The main purpose of this paper is to launch a scholarly discourse on the potential use of Task Stream as a Web 2.0 tool. To this end, there is an emphasis on mathematics education, the context of the authors' work with teacher candidates. In addition, the paper describes Web 2.0 activities within Task Stream related to teacher educators' professional development. As will be shown below, such use of Task Stream has much to offer teacher educators and their students in improving teaching and enhancing learning through interactive communication and collaboration.

It should be noted that the idea of using available tools for purposes beyond their original design is not new. A classic example of the appropriation of software designed primarily for one domain in another domain is the electronic spreadsheet created originally for accounting purposes only. However, its educational potential was conceptualized by the designer in educational terms as "an electronic blackboard and electronic chalk in the classroom" (Power, 2000) and later was realized by a variety of applications in multiple educational contexts (Baker & Sugden, 2003). Likewise, the appropriation of Task Stream, conceptualized by its designers as "Tools of engagement," in the Web 2.0 context enables prospective teachers as well as teacher educators to be engaged in interactive communications that go beyond what is typical for the use of Task Stream as an assessment tool within a program of professional education for teachers.

TASK STREAM AS A WEB 2.0 TOOL

DISCUSSION BOARD AS A LEARNING MEDIUM

One feature of Task Stream includes the possibility of ongoing communication within a defined community of learners (i.e., a course or seminar) through a Discussion Board (DB). Unlike email, the DB supports threaded messages organized by topics. Through the DB, a user can initiate a new topic, search for a given topic, add attachments and web links, and post and edit replies. Within a topic, messages can be viewed in either chronological (flat) or threaded sequence. The DB domain of Task Stream may be considered as an electronic portfolio that belongs to a group of individuals (a defined learning community). This recording medium is capable of supporting a variety of communications, including attachments and web links. Using Task Stream as a Web 2.0 technology, students in a course can be engaged in educational discussions facilitated and led by the instructor. In much the same way, a group of faculty organized for a specific professional development and learning activity can use Task Stream for posting (and thus recording) communications related to this activity.

Each such group may be conceptualized as a community of practice within which the process of shaping an individual identity can be mediated by the learning medium of Web 2.0 technology; in our case, by the DB of Task Stream. The concept of community of practice (Wenger, 1998) or, alternatively, a social network (Aviv, Erlich, Ravid, & Geva, 2003) is understood as a group of individuals related to each other through participating in communal activity, and experiencing/continuously creating their shared identity through engaging in and contributing to the practices of their community. Thus, two distinct communities of practice will be considered in this paper in the context of using Task Stream as a Web 2.0 technology – one is a learning community of students (that includes a course instructor) and another is a learning community of faculty (that, occasionally, includes students).

Because all students in the teacher education unit are required to subscribe to Task Stream and all faculty are provided access, it is advantageous to use this tool as an alternative to e-mail to enhance student learning and faculty collaboration. For example, in a mathematics content course for prospective elementary teachers all of the assignments require students to use computing technology. Students in this course are encouraged to collaborate, discuss their ideas, and learn technology applications in small groups. Through the DB, students can share their work and request feedback from peers and the instructor. In many aspects, communication through the DB is superior to that of e-mail because all postings can be viewed in a chronological sequence and organized by topics.

DISCUSSION BOARD VERSUS E-MAIL EXCHANGES AS A COMMUNICATION MEDIUM

The use of email as a communication tool for learning has become widespread, primarily because it is widely available and easy to use. Researchers have found that the use of e-mail in educational settings promotes student cognitive growth in specific domains of knowledge (Yu & Yu, 2002), fosters a more positive affective learning climate, and increases intercultural communication (Ruhe, 1998). Both e-mail and the DB share certain characteristics: they both support forms of asynchronous communication, which give users greater control over their messages – allowing participation as time affords and providing users time to compose and reflect on their messages.

However, it is important to remember that it is not only the medium itself that enhances communication, but also the context in which it is used. As Lee (1994) stated, “Richness or leanness is not an inherent property of the electronic mail medium, but an emergent property of the interaction of the electronic mail with its organizational context.” Yet, the degree of value of a medium is a function of user’s understanding and vision of how it can be utilized to support specific needs. Therefore, the more features a medium supports, the richer the context in which it may be used. Indeed, the DB domain of Task Stream includes a number of additional features that distinguish it from e-mail and thus provides a more powerful platform for learning activities.

One such feature is the ability to organize communications within defined topics. The DB is organized into discussion threads that have several structural levels: Category, Forum, Topic, and Reply. A Category is the highest level in the DB and is used to identify general areas of discussion. Forums are sub-levels within a Category and identify specific discussion topics on the DB. A Topic is the next level in the hierarchy and messages can be posted at this level by all Task Stream users. A Reply is the fourth level where any user can respond to a posted topic or to a previous reply to the topic. Having the ability to arrange course communications within such a differentiated and organized structure gives the DB of Task Stream a powerful pedagogical advantage over e-mail.

Another feature distinguishing the DB from e-mail is the option to view messages in either chronological (flat) order or threaded (topic-organized) fashion. Even though e-mail can support the former view, it is not automatic. However, whereas e-mail does not support the latter view, the DB does support both views. This allows the user a much clearer perspective on all related exchanges within the discussion topic without being distracted by extraneous or irrelevant posts. The third feature is that on the DB authors have the ability to go back and edit earlier postings, unlike e-mail messages that cannot be altered once sent.

An additional advantage of the DB environment is that commenting on one student’s work serves many students. In that way, the comment automatically becomes visible to the whole class. One can contrast this with e-mail, which is typically a one-to-one correspondence that is not visible to others, although it is possible to copy to other class members on an e-mail reply.

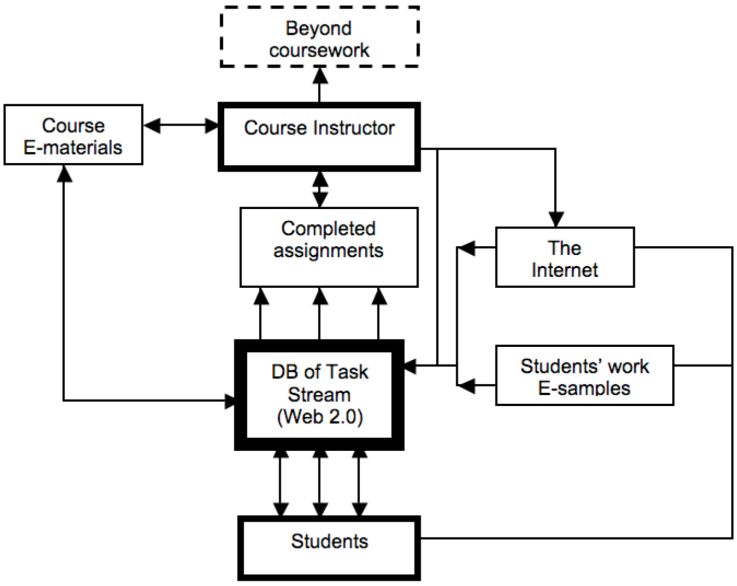
Task Stream includes a version of e-mail called the Message Center, which allows messages to be sent to an individual or group from within the system. When enabled, the system sends a notification to recipient’s external email address when he or she gets a message in the Message Center. One current shortcoming of the DB is that there is no such notification to external email when a new posting has been made. This means that the users must go to Task Stream and check the DB for new posts on a regular basis. In a class setting, the instructor should make students aware of the need to check the DB regularly. All things considered, Task Stream does provide a robust communication platform to support students’ engagement and intellectual growth.

USING DISCUSSION BOARD AS AN EXTENSION OF CLASS COMMUNICATION

As was introduced above, a community of practice refers to the process of social learning that occurs when a group of people, having a common interest in some subject or problem, collaborates over an extended period of time (Wenger, 1998). These communal activities mediate the learning of the participants of the community. Wenger focuses on the participation–reification duality in explaining how the community advances its learning agenda. Reification is a process of presenting abstract ideas in concrete forms. Here, the focus is on representation. However, knowledge of representation itself is not sufficient for the learning to occur. It also requires participation in the activities. Typically, effective learning requires that these two processes operate in a reciprocal manner. A Web 2.0 technology provides a medium for such reciprocal participation where ideas, concepts, and their representations can be validated through practice.

For example, technology developed to support a concept representation and/or the development of abstract ideas through the concreteness of computing by prospective teachers requires their understanding of the operational design of the computational medium being used. Without such understanding, there is a danger that technology "can hide broader meanings in blind sequences of operations" (Wenger, 1998, p. 61) when the teachers are attempting to use it as a way of reifying an abstract concept. Discussion made possible by a Web 2.0 setting enables successful interaction of reification and participation through coordinating different representations and actions towards a common goal of learning. Like the hidden mathematics curriculum framework (Abramovich & Brouwer, 2003) can help prospective teachers gain conceptual insight into material they teach, this interaction can reveal hidden aspects of the computational environment used by the teachers to aid both conceptual and operational understanding.

Figure 1. A Web 2.0 community of practice



Therefore, the DB feature of Task Stream can be understood as a platform that supports a community of practice associated with a teacher education course (Figure 1). The DB acts as the central hub that organizes and structures learning and communication activities related to the course. These activities include creating topics on the DB around which class discourse takes place. The instructor includes directions to students on his or her expectations for their use of the DB (e.g., number of posts, length of posts, etc.) and designs and structures the course by using e-materials. Typically, these materials are made available to the students at the beginning of the course through the Internet or a local server. However, because of the DB discussions, some of the materials may have to be revised or extended to reflect the Web 2.0 interactions over time. These modified e-materials, when attached to messages posted by the instructor on the DB, extend students' work on the course assignments, thus further enhancing learning.

Students are expected to contribute to the DB discussions also. These contributions may include sharing electronic samples of their work to support postings and inquiries, and to inform other students as well as the instructor about their progress. The instructor responds to student contributions and initiates new discussions (and potentially new topics) on the DB. Both students and the instructor are able to support their communications through including links to Internet resources. In doing so, the community of practice continually fertilizes the DB.

Furthermore, completed assignments go to the instructor for evaluation. The instructor evaluates student work as it is submitted. With the encouragement of the instructor, excerpts of the best student work can be shared within the community of practice as well as developed further with the goal of being presented to a larger community at teaching conferences or other professional development meetings. Finally, through Web 2.0 communication between professor and students, new micro communities of scholars can be created, as participants communicate with each other on issues of special interest that may extend beyond the formal coursework.

SUPPORTING MULTIPLE VOICES BY ENCOURAGING STUDENT CONTRIBUTIONS

A primary value of applying Web 2.0 technologies in educational settings is to create learning environments that encourage student development, overcoming such limitations as time constraints and class size (MacKnight, 2001). Instructors who are already using Task Stream as an assessment tool may choose to use some other Web 2.0 features of the system to support student learning. This section will consider the question of how multiple student voices can be encouraged through the Web 2.0 enhanced learning of mathematics.

The use of the Task Stream DB provides a safe space for students to ask questions and post messages. In contrast to the immediacy of the classroom dynamic, the asynchronous nature of the DB interaction gives students time to think about the questions or comments they want to contribute to the discussion. The additional time provided for thinking and reflection allows students to formulate better contributions and also to feel more confident in posting them. In addition, students take more care in posting messages, knowing that others will be reading them. Students are often insecure about taking intellectual risks in the classroom, particularly when mathematics is the focus. The use of the DB creates a safer environment for students to take such risks, as they are not “put on the spot” to respond without having the opportunity to think about their reply. Furthermore, similar to Dysthe (2002) and Matusov, Hayes, and Pluta (2005), students’ contributions to the DB discussions are not graded directly on their content to avoid putting barriers in the way of open discussion of ideas; yet contributions are counted towards the student participation grade to reward engagement. It should be noted that course credit (or extra credit) for class participation and the *quality* of participation is easier to measure when using a tool such as the DB. Perhaps one should announce that this metric will be used as a measurement instrument for given (extra) credit so as to encourage students posting meaningful questions, and not getting the idea that the quantity and not the quality of messages is most important.

At the same time, some mathematics students may be hesitant to ask questions fearing the possibly awkward situation of when their professor might not be able to adequately answer a question. If this observation is correct, then a teacher’s knowledge can affect the quantity and quality of students’ questions. Indeed, one can recall the phenomenon reported by Bruner (1985) who, referring to work by Tizard and her colleagues, observed a reciprocal relationship between parents’ knowledge and their children’s ability to ask questions. In the context of the classroom, teachers can be substituted for parents. The DB environment, controlled and maintained by a skilled instructor/facilitator, stimulates students' participation in these discussions and encourages them to ask good questions – ones for which they are confident a reasonable response will be made available.

SOCIAL ORIGINS OF INDIVIDUAL MENTAL FUNCTIONING

Many studies on technology-mediated communication in education, following the Vygotskian tradition of seeing learning as an internalization of human-to-human interaction (Vygotsky, 1978; Wertsch, 1991), have emphasized and capitalized on the notion of the social origin of individual mental functioning (Laurillard, 1993; Kang, 1998; Zhu, 1998; Dysthe, 2002; McDuffie & Slavit, 2003; Matusov, Hayes, & Pluta, 2005). A Web 2.0 technology enables asynchronous communication within a learning community that strongly supports this notion. By posting a message on the DB, one strives to structure it in such a way as to engage other members of the community of learners in a Web 2.0 interaction. There is evidence though that in a community where members have differential authority (e.g., instructor vs. students) the initial communication may be delayed when the subordinate members of the community are hesitant to initiate the discussion (Light, Nesbitt, Light, & Burns, 2000). Therefore a social factor like the grading of communications posted by the members of such a non-symmetrical community may affect the efficiency of communication. Moreover, as was mentioned above, it is important that students' contributions to the DB discussions are not graded directly on their content. In the same way, this may typically be the case in a heterogeneous community of faculty when junior faculty members are reluctant to communicate their thoughts openly through an electronic medium.

Another socio-cultural aspect of communication through a Web 2.0 medium deals with a well-known phenomenon that when students hearing other students explain difficult concepts in their own, potentially not fully professional, language provides a very effective learning experience. This is consistent with notion that "an utterance reflects not only the voice producing it but also the voices to which it is addressed" (Wertsch, 1991, p. 53). In such cases, being aware that, to a large extent, within this kind of interaction "the codes of the speaker and listener most completely coincide" (Lotman, 1988, p. 34), the instructor is wise not to interfere unless providing clarification and refinement of such student-to-student explanations is necessary. However, unlike a non-recorded student's utterance spoken in the classroom, a student's written posting on the DB appears to manifest more culturally appropriate language, which therefore reflects the teacher's voice as well. It should be also noted that DB postings can be edited any time thus allowing for an individual's growth through Web 2.0-based interactions.

LEARNING TO USE MATHEMATICS AS SOCIAL LANGUAGE

The focus on the use of social language in analyzing teachers' communications in a mathematics content course is due to the course requirement of a culminating portfolio which, by its didactical design, should serve as a major source of information about mathematical concepts during the teachers' inductive years. Through communications via the DB, teacher candidates learn to use correct mathematics terminology that is very important for their professional development as teachers of elementary school mathematics. The DB is a setting within which teacher candidates can learn using correct mathematical terminology and, subsequently, communicate mathematics to their students in a culturally accepted way. The Web 2.0-based interactive communication between students and the course instructor constitutes an important learning experience for the teachers.

Illustration 1. In one particular instance, the instructor used the DB of Task Stream to advise a teacher on the correct use of mathematics language (terminology) in the context of mathematical problem posing. In giving that kind of feedback, the instructor extended the learning environment of the classroom to allow for new concepts and definitions to be introduced. Furthermore, the public nature of the DB implies that only the right terminology has to be recorded.

So, in response to the question about numerical coherence (Abramovich & Cho, 2008) of the problem: "The cost of three identical meals is $45.23 before tax. What is the cost of one meal?" a teacher correctly divided 3 into 45.23 to get 15.0766… and then stated that this number does not exist. Although the meaning of what the teacher had in mind was clear to the instructor (that is, a price of one meal can only be represented by a number with two digits after the decimal point), the latter saw here an opportunity to further develop the teacher's knowledge of mathematics terminology by referring to this number as a repeating decimal, a rational number. Here, the instructor can go beyond the course curriculum and even explain the difference between rational and irrational numbers in terms of their decimal representations. However, through the DB, this could be done in a non-intimidating manner in comparison with making such a passage into mathematics within a classroom setting. Those students, who want to learn social language, do learn it. By modeling culturally appropriate communication within the DB, the instructor helps students develop skill in using the professional language of mathematics. When the voice of prospective teacher incorporates the voice of the course instructor one can conclude that professional growth has indeed occurred.

The teacher candidates taking a mathematics content course are asked to reflect on their work by answering specific yet open-ended questions by the instructor. The command of professional language used in these reflections varies to a large degree. However, it has been observed that the teacher's participation in the DB discussions contributed to the development of their use of professional language of mathematics. By that we mean that teachers use correct terminology that matches the concepts introduced and the situation discussed. To encourage online discussion about the use of a spreadsheet in problem posing, the following exchange between the instructor and a student was initiated in a public forum.

Instructor: I have a question for you. Consider the problem: The cost of three identical meals is $45.23 before tax. What is the cost of one meal? Is this problem numerically coherent? Why or why not?

Student: The problem is not numerically coherent because each meal would cost $15.07666… As this is a repeating number for infinity, the number does not exist. The problem isn't contextually coherent either, because there are definitely no denominations of money to account for .00666… .

Instructor: You said that the number $15.07666… does not exist. It does exist. It is called a repeating decimal, which is a rational number. However, it cannot represent the cost of anything for the reason you stated. Could you reformulate my problem to make it numerically coherent?

Student: Here is a problem that is both numerically and contextually correct: The cost of three identical meals is $45.75 before tax. What is the cost of one meal?
$45.75/3=$15.25.
In this case, the solution is numerically coherent because it can be represented by existing currency (before .666667 could not be represented by currency, although it was a number.) It is also contextually coherent because each meal can be represented by 1 ten, 1 five, and 1 quarter (or other combinations). These are all currency that exists in our American Culture.

Instructor: I recommend that you take a look at a paper by Abramovich and Brouwer (see the link Hidden Curriculum):

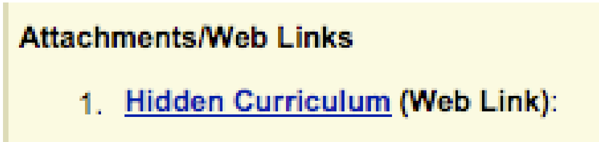


Figure 2. Sample Web Link

As shown in Figure 2, the Hidden Curriculum link will lead the student to Abramovich and Brouwer's paper. Note that the reference to other combinations of coins available in US currency made by the teacher in the context of numerical coherence in problem posing prompted making a reference to a hidden mathematics curriculum paper by the authors (Abramovich & Brouwer, 2003). Indeed, the above problem can be extended to allow for the following inquiry: *In how many ways one can pay $15.25 by using quarters and bills of ten and five dollar denominations?* The answer to this question is: There exist six ways of paying for the meal with the available bills and coins. This is just one example of how web links can support students' learning through the use of the DB domain of Task Stream.

USING THE DISCUSSION BOARD AS A TOOL IN SUPPORTING A FACULTY SEMINAR

One of the main goals of applying Web 2.0 technologies in educational settings is to encourage and enhance communication and collaboration. Recently, faculty members within the SUNY Potsdam School of Education and Professional Studies have initiated a research seminar. The goal of the seminar is to allow faculty in education to present their work to colleagues and receive feedback that would enable them to successfully publish their work in peer reviewed venues.

The seminar meets for one hour every other week in a smart classroom to allow for the technological enhancement of the forum. During their presentations, faculty use traditional technology tools such as PowerPoint and the Internet through which to demonstrate relevant web sites. The use of the Internet was further extended by utilizing Task Stream's DB. This Web 2.0 tool enables the forum to be enlarged, both in terms of time and space for discussion. Each presentation serves as a discrete topic within the DB and so allows focused interaction on each work shared with the group. Through asynchronous peer discussions of the work shared, a presenter can be asked additional questions with the expectation that they will be answered in a timely fashion. By the same token, presenters expect to be provided with feedback not possible in the more time-bound environment of a traditional seminar. DB-based discourse that occurs between two consecutive seminar meetings can then be revisited by all those present by projecting the record of such Web 2.0 interactions to the screen. Furthermore, any member of the group can revisit any topic at any time later, if he or she can add more to this discussion. Like in the case of faculty-student interaction through the DB, multiple voices heard in a Web 2.0 environment can animate the voices of those who want to participate in the discussion but have been limited by the time and format of the seminar.

Besides comments and suggestions included in peer feedback, such additions may include references to relevant literature. Just as an instructor, when recommending a paper to students, may include a link to that paper in a DB posting (see Illustration 1 above), any faculty member who initiates a message with a literature reference may enhance communication by including a persistent link to the document if it is available electronically.

Illustration 2. Within the field of education, there are many subdisciplines (for example, English education, mathematics education, special education, intercultural education, etc.), each with their own terminology, theoretical constructs, and rigor. So active participation in an education seminar may present a challenge as faculty members attempt to build bridges across the spectrum of disciplines. Particularly, this is difficult given the time constraints of a traditional seminar. Using the DB as a support system can foster one's ability to build such bridges in a setting that does not have the same time limitation. In what follows, participants interact over time with the presenter (on the topic of documenting critical incidences as a way of assessing international and intercultural education outcomes) in an attempt to understand the nature of the discipline under discussion and clarify certain definitions associated with it.

Participant 1: … I have a question to ask you regarding definitions of concepts that you introduced at the beginning of your talk. Are they universal across all scholarly work in your area or do different researchers use different definitions?

Presenter: International and intercultural education are relatively new fields and definitions associated with them are evolving, especially with increased scrutinization being given to outcomes assessment. You are quite right that definitions (even for the five terms I highlighted) are inconsistent at the moment. … For the purposes of this presentation, I offered working definitions.

This format can also be used to give presenters feedback of a more general nature as illustrated by the following exchange.

Participant 2: You revealed much about yourself in the presentation today and I think it's great when people can integrate their scholarly interests with their personal interests and goals. It's a nice model.

Presenter: Revealing oneself is risky business. In intercultural and international education outcomes assessment, it is imperative that the participants articulate how and what they've learned about themselves, others, and the world in which we are interdependent. … I appreciate this professional development seminar for the platform and support it can provide all of us as we continue to investigate our areas of interest.

It should be noted that the two participants were both unfamiliar with this educational subdiscipline. However, through DB-supported dialogue they were able to ask questions and further their understanding of the field new to them. The presenter receives valuable feedback and has the opportunity to clarify their thinking. It is clear that through such interactions, all parties benefit.

CONCLUSION

REMARKS ON THE USE OF TASK STREAM AS A WEB 2.0 TOOL

The authors found the use of Task Steam's DB worked quite effectively as a platform to extend discourse both in class and faculty seminar settings. In the case of the class, this platform enabled the enhancement of faculty-student interaction through more flexible use of electronic course materials. Drawing on the social origins of individual mental functioning, the instructor's use of the platform allowed for greater participation of all students, removing barriers that might have existed in a traditional classroom due to its inherently synchronous nature. Furthermore, students' postings on the DB increasingly demonstrated growth in the use of culturally appropriate language of mathematics.

In the case of the seminar, the use of Task Stream as a Web 2.0 tool provided medium to extend the intellectual space of the professional seminar, allowing faculty to present their ideas and be able to continue receiving ongoing feedback and respond to this feedback on their own pace through online discussion. One can argue that the use of Task Stream may be linked with the notion of outsourcing, commonly associated with Web 2.0 technologies. Indeed, asking seminar participants to reflect on and discuss ideas raised by a scholarly presentation makes more efficient use of the intellectual resources of the community. Moreover, the study revealed that some faculty who typically are not users of Task Stream become motivated to use the tool so as to be entirely aware of the full scope of discussion related to their participation. In that way, the use of technology in general is promoted among teachers education faculty potentially affecting their use of technology with teacher candidates.

In addition, the use of the DB has a number of advantages over the use of e-mail in educational settings. The ability to organize communication within defined topics, to view messages in multiple ways, to edit previously posted messages, to allow exchanges to be visible to the entire group, and to enable all members of the community to work with a common archival structure of communication – all these set the DB apart from the capacity of email; an application oriented on individual preferences. Furthermore, in certain settings, the entire DB of Task Stream serves as a complete record of past Web 2.0 activities for new users.

RECOMMENDATIONS AND OBSERVATIONS

In conclusion, the number of recommendations can be made. First, in much the same way as the DB supports extended discussion associated with a research seminar, department and committee meetings can be expanded to give more time for dialogue and discussion beyond the defined meeting time. Second, an apparent limitation of Task Stream is that it cannot be used easily across different campuses. There are issues associated with enrolling people from other local institutions who may be interested in participating in a faculty seminar but their schools have not adopted Task Stream. By the same token, the educational applications of Task Stream as a Web 2.0 tool discussed in this paper, despite this limitation, did serve users well by providing a more manageable environment for asynchronous communication. As with other technologies in the past, the more teacher education institutions use Task Stream as a Web 2.0 technology, the more functions will likely become available, thereby removing boundaries of intercampus discourse. The authors encourage the Task Stream developers to continue to expand the system's features so that the system may be used beyond its original design to further support Web 2.0-oriented activities described in this paper.

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