

Moving Professional Development Online: Meeting the Needs and Expectations of All Teachers

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There is widespread agreement that teacher professional development (PD) is critical for the success of standards-based reform in U.S. schools (Committee on Science and Mathematics Teacher Preparation, 2001). However, the current infrastructure for professional development is ill-equipped to serve the numbers of teachers who need support in order to employ innovative teaching methods advocated by national standards, such as inquiry-oriented or project-based learning. Online PD is one possible solution for bringing high-quality PD to ever-growing numbers of teachers. This paper is about a program of empirical research to examine the needs, expectations, and experiences that teachers who are engaged in systemic reform have for online PD. The goal of this research is to understand how to design online PD environments that are useful for and usable by broad populations of teachers, as part of the design of Knowledge Networks On the Web (KNOW) (Fishman, in press), an online PD tool developed for use by the Center for Learning Technologies in Urban Schools (Blumenfeld, Fishman, Krajcik, Marx, & Soloway, 2000).

Chief among the factors motivating this study is the fact that research on PD in general does not link directly to outcomes and there is little evidence that PD has an effect on classroom practice, and less evidence linking PD to student learning (Frechtling, Sharp, Carey, & Vaden-Kiernan, 1995; Wilson & Berne, 1999). This is also true of research about online PD where most available studies have focused on issues such as community formation and online discourse patterns (Bautista, 1998; Hammond, 1998), *not* on teacher learning or the impact of online PD on student learning. This link between PD and student learning is an important connection to make if we are to determine the worth of any PD opportunity. This study is the first in a series of studies on the design and use of online PD tools (we plan to explore the connection between PD and student learning in future work). Another important factor motivating this proposal is that most PD research, both online and traditional, has been conducted with “volunteer” populations of teachers (Bobrowsky, Marx, & Fishman, 2001). Without claiming that there are necessarily differences in terms of professional development needs between volunteer and other populations of teachers, it does seem likely that areas such as motivation are likely to differ, and must be attended to in design. We need to understand the PD needs of *all* teachers if systemic reform is to be effective. Finally, few published studies have focused on needs assessment related to the design of on-line professional development, so there is little empirical guidance for the design of online PD environments such as KNOW.

In the first part of this paper we provide a brief description of KNOW the on-line professional development environment we studied and a concise literature review that situates

our work within the existing corpus or research surrounding on-line PD. Next we describe the methods we used to collect our data and the criteria for selecting our sample. In the findings section we discuss the results of our needs assessment and the design implications stemming from our analysis of the logging data and participant interviews. We close the paper by reviewing the next phase of research we intend to conduct with KNOW.

Knowledge Networks On the Web (KNOW)

KNOW is an on-line professional development environment developed by hi-ce for use with curriculum materials that were originally developed as part of LeTUS. KNOW provides an environment that is intended to leverage knowledge held by a community of teachers who enact particular curricula in their classrooms and make that knowledge available to others attempting to use that same curriculum. KNOW is built around standards-based, inquiry-oriented, and technology-rich curriculum materials, and uses videos, student work, and other materials and resources designed to help teachers understand how to interpret curriculum so that it becomes more useable in their local context. KNOW provides teachers with access to a level of detail and customization that is impossible to achieve using traditional text-based materials, but is ideally suited to the web. Furthermore, KNOW supports ongoing asynchronous conversations about how to teach specific curricula, linked to an organically growing set of examples and elaborations, generated jointly by the community of teachers using KNOW and by the curriculum developers. In a sense, logging on to KNOW is like walking into a room full of teachers talking about and sharing their personal experiences of curriculum enactment with its multiple challenges. Teachers who use KNOW employ it variously as a substitute for and an enhancement of face-to-face professional development, as a planning tool, and as a community forum and collaboration environment.

Literature Review

Existing technology affords us the ability to provide a wide range of content via the Internet but it's important that we maintain a clear objective when designing online learning opportunities. Simply because we possess the technological capability to conduct professional development online is not sufficient rationale to do so (Ely, 1996). Dede (Dede, 1996) asserts that future advancement in distance education is not dependent on *technological* development but rather on the *professional* development of those who design and participate in these learning environments. In our design of KNOW we are committed to creating an online environment driven by the needs of our users rather than the capabilities of the technology which is why we decided to conduct a needs assessment for KNOW.

Existing literature related to traditional PD settings suggests that teachers have different expectations and needs based on their experience level (Adams & Krockover, 1997; Hewson, Tabachnick, Zetchner, & Lemberger, 1999). Teachers new to the profession are concerned with gaining more classroom experience so they can hone their lesson planning and classroom management skills. Inservice teachers are often more accomplished in these areas and look to spend time in professional development discussing issues of pedagogy and curriculum at a

deeper level (Barab, MaKinster, Moore, & Cunningham, 2001). Research also indicates that teachers differ in their feelings about technology based on their years of experience. In a survey commissioned by the National Center for Education Statistics (NCES) Rowand (2000) found that teachers with fewer years of experience felt more prepared to use computers and the Internet in their teaching than their more experienced colleagues. These findings aren't necessarily surprising but they highlight other differences among users that one might expect to find when designing for a broad population of teachers engaged in systemic reform. Acknowledging that these differences exist, we included questions in our needs assessment that would help us understand the experience level and teaching background of our sample group.

KNOW is designed to serve a population of teachers enacting the LeTUS curricula as a result of their involvement in a systemic reform effort (Fishman, in press). This is unique from other existing online PD environments such as the Inquiry Learning Forum (ILF) (Barab et al., 2001) and TAPPED-IN (Fusco, Gehlbach, & Schlager, 2000) that are intended for use by self-selected or volunteer teachers. KNOW must address the needs of all teachers involved in the reform effort including those individuals whose participation may have been strongly encouraged or even mandated by district policy. This distinction in user population is worth noting because much of the available research on professional development focuses on groups of volunteer teachers who are, more often than not, motivated to change or try something new (Supovitz & Zeif, 2000). It is as yet unclear what the implications of this focus on “motivated volunteers” are for our understanding of the role of online PD, but we argue that the differences are sufficient to warrant investigation (Bobrowsky, Marx, & Fishman, 2001). By drawing our sample from a group of teachers involved in systemic reform we have an opportunity to study the impact of online PD across a broad range of users rather than limiting ourselves to those volunteers who seek out such learning opportunities on their own.

Methods

This study proceeded in two phases. It involved a focused needs assessment study conducted with 36 middle school science teachers. The sample was drawn from Detroit Public Schools (DPS) teachers participating in the Center for Learning Technologies in Urban Schools (LeTUS). Through their participation in LeTUS the teachers are provided with multiple opportunities for professional development that include monthly workshops, in-class support, participation in focus groups and an educative curriculum (Ball & Cohen, 1996; Schneider & Krajcik, 2002). KNOW is just one of the many PD sites DPS teachers can access in order to help them implement the curriculum.

Teachers were selected based on their anticipated use of a particular middle school science curriculum developed as part of LeTUS. All subjects were expected to be users of KNOW, though none had used KNOW at the time of this needs assessment. Another unique feature of KNOW is that it is designed to help teachers learn about and enact specific curriculum materials, as opposed to being (for example) oriented around general principles of inquiry-oriented teaching. Our intent in the design of KNOW was to develop a tool that would be immediately relevant to teachers engaged in systemic reform. By conducting this needs

assessment we hoped to determine what kinds of features teachers were looking for in an online PD tool and, more specifically, how they expected to use KNOW.

The survey (see Appendix A) included questions about teaching experience, involvement in reform efforts, prior experiences with online PD and computer proficiency. Teachers were asked about how they became involved in the current curriculum effort and about their anticipated PD needs related to implementing the unit. Specific questions pertaining to expected use of various features incorporated into KNOW were also included. Surveys were administered to teachers during two separate workshops held during the summer.

The second phase of data collection included observations of how teachers actually used online PD (KNOW). Usage of KNOW was tracked by compiling data from web logs, which allowed us to see what features of KNOW teachers were using and how long they spent accessing each of those features. Logging data for the various features of KNOW was also aggregated across the sample population in order to make comparisons between teachers' *expected* and *actual* uses of online PD. To augment the logging data informal interviews were conducted with a sub-sample of users. These teachers were selected on the basis of their login frequency and the different perspectives they each brought to KNOW.

Findings

In this section we review the results of the needs assessment and analyze the logging data collected through KNOW. A detailed analysis conducted on the usage patterns of three participating teachers is also included in this section. These mini-cases provide insight into how the system is being used and raise several new design challenges that must be addressed in order for KNOW to be valuable for all teachers.

Needs Assessment

Teachers in our sample have an average of 9.3 years teaching experience, 4.3 years teaching science and nearly all of the teachers previously taught the specified LeTUS curriculum. All but 3 of the teachers were certified to teach science. The majority of the sample considered themselves proficient and comfortable in using computers to create and transfer documents, download files and software and navigate the web.

While all the teachers reported that they have computer and Internet access at home and school, the majority anticipated using KNOW primarily from school in order to take advantage of the faster Internet connection. Everyone in the sample had experience using web search engines to locate content specific information and lesson plans but this is the extent of the online PD experience for most of the teachers surveyed. Only four teachers reported having taken a course online and likewise there were only four who had participated in an online discussion group.

To better understand the motivation of our sample we asked teachers how they became involved with the LeTUS curriculums and what degree of choice they felt they had when deciding to enact any or all of the units. All of the teachers reported that either a fellow teacher

or building administrator introduced them to LeTUS. 12 of the teachers said they chose to teach the units, 18 said they were encouraged and 5 stated that their principals required them.

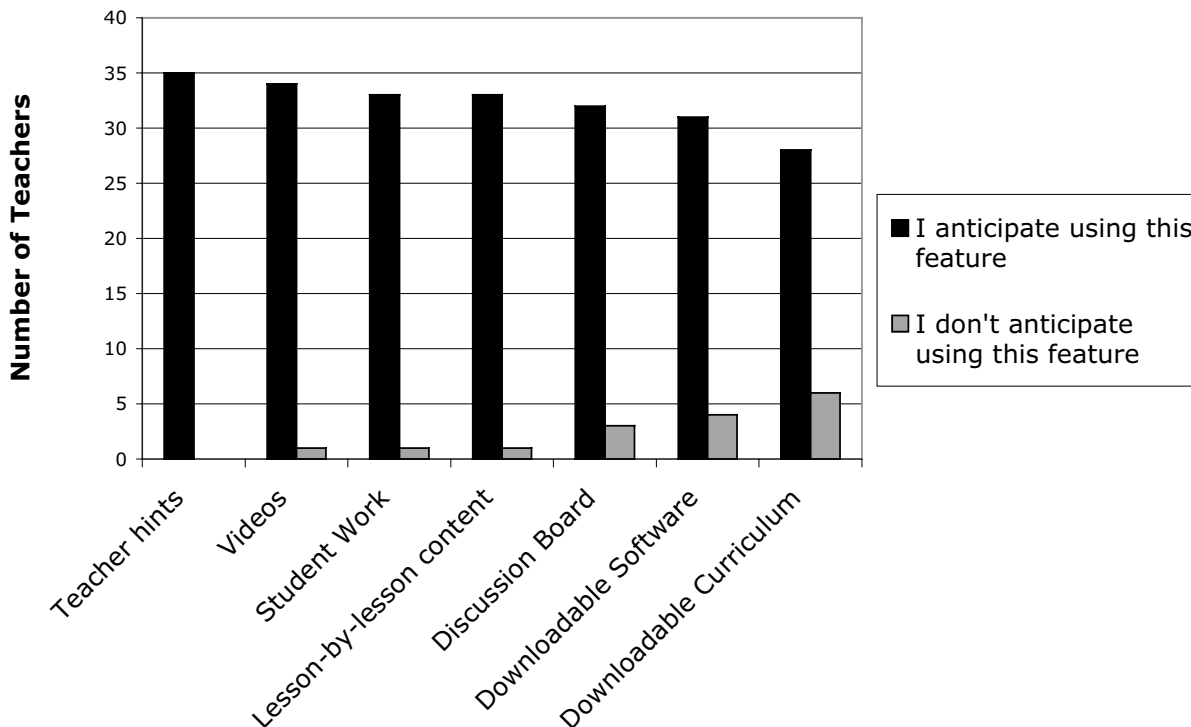


Figure 1. Teachers’ anticipated use of features in KNOW.

Results from the needs assessment further indicated that teachers anticipated using the many features available on KNOW with the same degree of frequency. Figure 1 shows that the majority of our sample anticipated using *every* feature on KNOW with a similar degree of frequency (n=35, but some teachers did not answer all questions, so values do not always add up to 35). In conducting this survey we expected teachers to show preferences towards those features they felt held more value. As it turned out, the lack of familiarity with KNOW (and all on-line PD in general) made it difficult for teachers to assign meaningful value to any particular feature and correspondingly to anticipate a greater use of one feature over the next. We also expected that teachers might show a preference towards resources such as videos, student work examples and the discussion board because they represent resources only provided online through KNOW. This wasn’t the case because teachers had a difficult time visualizing how these resources would help them implement the curriculum due to their lack of experience with KNOW.

Teachers were given seven different PD formats to select from and asked first what formats they would *expect* to participate in as they taught the unit and then what formats they would *choose* to participate in to help them implement the curriculum. Online PD was the format teachers expected to use with the highest frequency with 63% of respondents indicating that they would use online resources at least once a week or more. The written curriculum,

which included all the materials provided to teachers in a curriculum binder at the beginning of the unit, was the only other PD format that teachers expected to use with any frequency. Less than 18% of teachers expected to use the remaining PD formats (study groups, focus groups, in-class support, Saturday workshops and for-credit coursework) on a weekly basis. Conversely, when asked what they would *choose* to participate in there was a broader array of responses as illustrated in Figure 2. The written curriculum, Saturday workshops and online resources were still the preferred formats but the remaining PD formats all rated fairly high in regards to teacher preference. However, since teachers both prefer to use online resources and have higher expectations in regards to their use of these resources it appears that our sample group anticipated a heavy reliance on KNOW and other web-based sources.

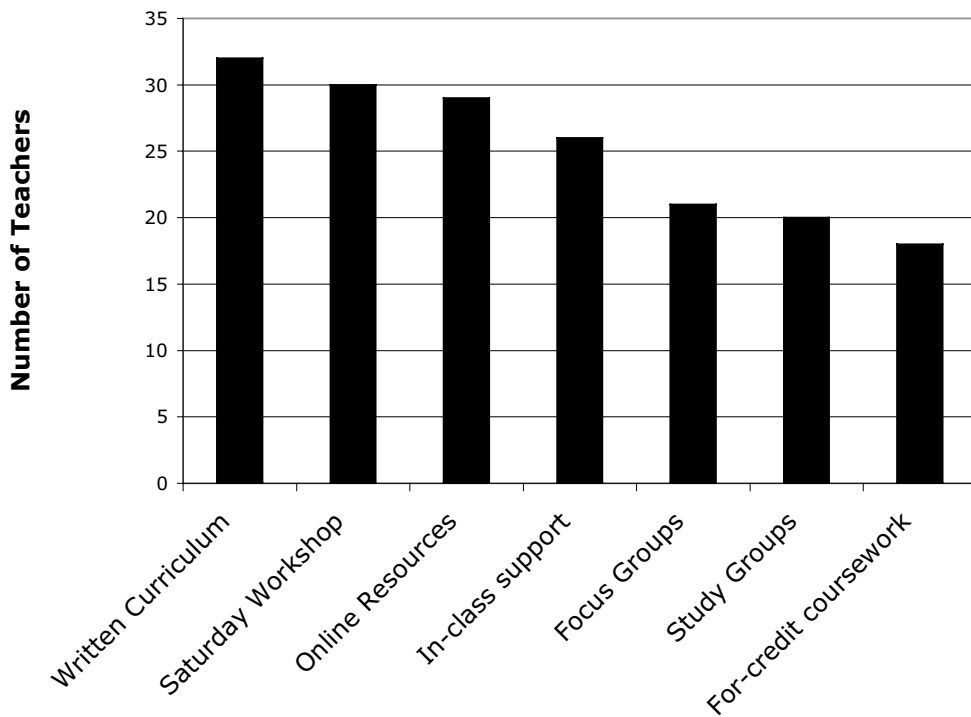


Figure 2. Teachers’ preferred mode of professional development.

Logging Data

In reviewing the logging data it's clear that teachers expected to use KNOW far more than they actually have. Figure 3 indicates that 91% of our sample expected to use KNOW at least 1 to 3 times per week. In reality, less than a third of the teachers are using the site with this kind of frequency. During the four-month period in which we reviewed logging data 8 teachers didn't access KNOW at all. The average number of logins for the remaining 27 teachers was 9.3 with a high of 27 and a low of 1. Since KNOW is still in the early stages of developing a community of practice (Lave & Wenger, 1991) this level of usage is not necessarily surprising. The majority of logins occurred during Saturday workshops when teachers were given specific

tasks to accomplish on KNOW such as posting in a discussion or viewing a video. We have the opportunity to facilitate this kind of directed use since KNOW is part of a larger reform effort. By embedding the use of an online PD resource within the context of a traditional workshop setting we are able to introduce teachers to the various features available on KNOW in the hopes of increasing their proficiency at using the site as a PD tool.

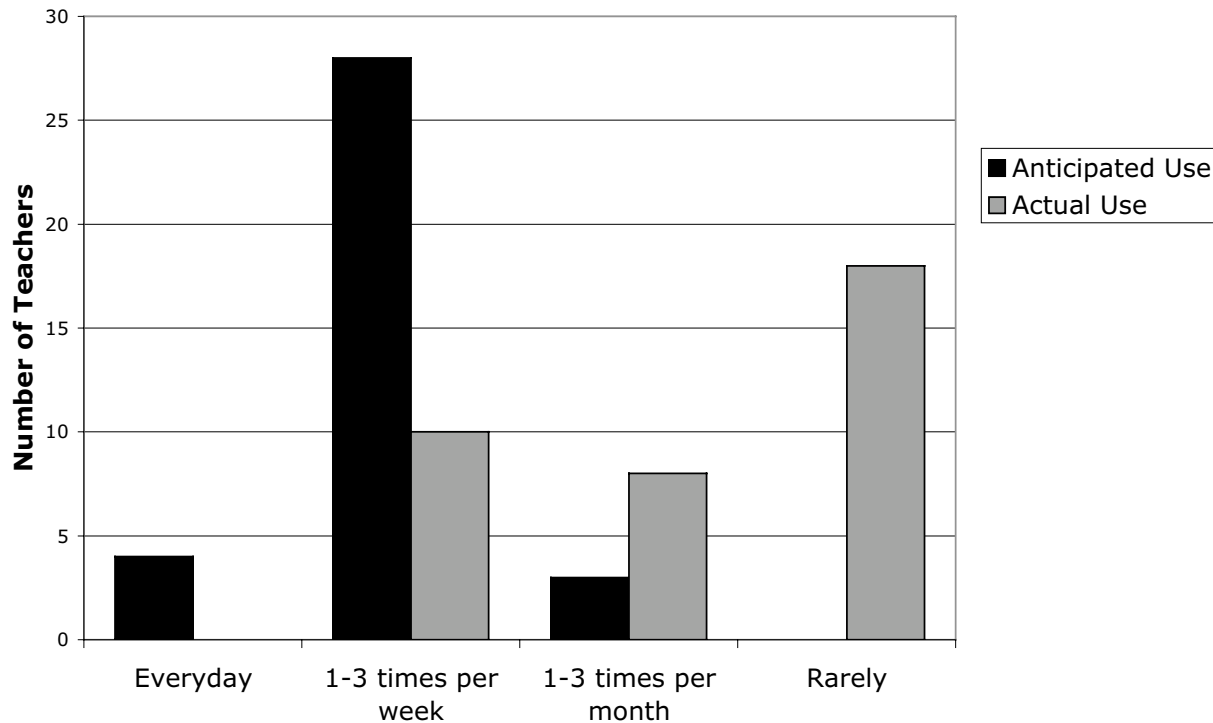


Figure 3. Teachers’ anticipated versus actual usage of KNOW.

Mini-Cases

Considering that KNOW is in the early stages of implementation we aren't surprised by the lack of usage revealed by the logging data. Rather than lamenting the fact that teachers aren't making more frequent use of the site we decided to identify individuals who were using KNOW regularly so we could learn what they found valuable about the site. We want to learn from the people who *are* using the site in order to make KNOW a more valuable option for those teachers who *are not* currently logging on. To do this we selected three teachers from our sample and analyzed their use of KNOW. Each of the teachers we selected accessed KNOW 1-3 times a week during our period of data collection and they each come to KNOW with unique characteristics.

Ms. Bradley serves in a leadership role within her district. In her role she has been asked to lead workshops, review/pilot new curriculums and serve as a content expert for her colleagues. Mr. Jackson represents the population of users who are unable to attend regularly scheduled

face-to-face workshops and rely on KNOW to serve as surrogate in place of the workshops. These teachers may have varying levels of experience and content area knowledge so even within this group there is variation in usage and needs. Ms. Daniels is the third teacher we profiled. She attends workshops regularly, is new to LeTUS, and like many of her colleagues her use of KNOW is largely restricted to directed usage opportunities provided during the face-to-face workshops.

Ms. Bradley

Like many schools across the nation, the districts we work with often utilize their own teaching staff to plan and lead professional development sessions. Teachers are usually selected for these leadership roles as a result of their experience and content area expertise (Fogleman et al., 2003). Ms. Bradley has taught several of the LeTUS units over the past five years and has been a lead teacher for her district since the beginning of the 2002-03 school year. She has planned and facilitated several curriculum specific workshops for her DPS colleagues this school year. We analyzed her use of KNOW to determine what unique user characteristics she might have as a lead teacher.

Logging records reveal that Ms. Bradley is one of the most frequent users of the system, accessing KNOW 26 times during our four-month period of data collection. She reported that her primary purpose in logging on to KNOW was two-fold. First of all, she likes to visit the discussion boards to read new messages and reply to questions her colleagues post. She also uses the discussion boards on KNOW to communicate with other lead teachers as they plan upcoming workshops. A discussion conference was created specifically for the lead teachers to facilitate this communication. Ms. Bradley was one of the most frequent users of this conference not only replying to messages but taking the initiative to create discussion threads as well. This initiative stimulated use of KNOW by other lead teachers who replied to the posts. However, Ms. Bradley stated that she wasn't always sure if other teachers were reading her discussion board posts so she often sent duplicate messages via e-mail, which resulted in a higher response rate. The lack of feedback, immediate or delayed, in asynchronous chat environments is often detrimental in the creation of sustained interactions (Barab et al., 2001; Bautista, 1998). Users aren't likely to sustain an online discussion if they perceive themselves as the sole conversant.

Ms. Bradley indicated that she also logs on to KNOW to review lessons in the curriculum and download student worksheets and supplemental reading materials, which are referred to as "student readers" within the unit. While Ms. Bradley appreciates the opportunity to preview the curriculum online she had hoped to be able to customize worksheets and other documents to make them more specialized for her students. Currently, documents download from KNOW as PDF files making them difficult to edit electronically. This issue of customization will become increasingly significant as the site scales to a larger population of teachers representing a more diverse array of students.

In her needs assessment survey Ms. Bradley indicated that she was particularly interested in using KNOW to view videos of demonstrations and classroom enactments. This hasn't happened as frequently as she originally anticipated for both technical and practical reasons. Initially, Ms. Bradley had trouble downloading and viewing movies because of outdated

software on her computer. Technological barriers are often the first hurdles that need to be cleared in order for online PD to be successful. On KNOW, we have taken several steps to break down these barriers so that teachers can access the multimedia content available on the site (Fishman, in press). However, addressing the technological problems for Ms. Bradley did not have a significant impact on her viewing of KNOW videos due to an unexpected consequence of her experience and facility with the unit. Because of her knowledge of the curriculum Ms. Bradley has been the subject of several classroom enactment videos. In addition, she has helped narrate and “star” in many of the demonstration videos available on KNOW that show how to set-up and operate the different apparatus used throughout the unit. Ms. Bradley reported that these videos are not particularly helpful for her since she is familiar with the lessons and activities they are designed to support.

Mr. Jackson

Mr. Jackson has experience teaching the inquiry based science units produced by LeTUS but at the time of our data collection he was teaching at a new grade level and therefore did not have previous experience with the *specific* curriculum he was using. Mr. Jackson reported that he would like to attend the Saturday workshops but personal obligations keep him from participating on a regular basis. Like Ms. Bradley, he visited KNOW 26 times during our period of data collection. Mr. Jackson stated that his usage of KNOW is directly related to his absence at the workshops. He often checks the discussion boards to read any posts that might summarize what took place at the workshops. He has also tried to access resources shared at the workshops and made available for download in the discussions area. Mr. Jackson reported trying to post a document that he created on the discussion board but aside from this attempt he has not initiated any other posts nor replied to any existing posts. Mr. Jackson indicated that he appreciates the opportunity to connect with workshop participants via KNOW but he feels that he often misses important information by not being physically present.

The other reason Mr. Jackson logs on to KNOW is to view the videos much like his colleagues previously discussed. Unfortunately, Mr. Jackson has yet to experience success in viewing any of the videos due to technical problems associated with outdated software and slow Internet connections both at home and school. He has tried to remedy the technical problems he has encountered but admits that he doesn't have the time to spend troubleshooting. We acknowledge the difficulty he has experienced, a difficulty that is certainly not unique to his situation judging by the discussion of Ms. Bradley, and realize that we need to take further steps to make the media resources on KNOW more accessible.

Ms. Daniels

Ms. Daniels participates regularly in the Saturday workshops and roughly half of her 22 KNOW logins have occurred during these training sessions. This is her first full year of teaching but she did use the LeTUS units to a limited extent last year as a student teacher. When asked about her use of KNOW Ms. Daniels reported that she logs on almost exclusively to access the discussion boards. She mentioned that her dial-up connection at home made even basic web surfing difficult and that she did not have Internet access in her classroom at school. This lack of

access to a high speed connection was the primary inhibitor to her using other features of KNOW.

Ms. Daniels has used the discussion boards both to share information and to ask content specific questions. For example, Ms. Daniels is teaching a unit on communicable diseases and her students occasionally have questions that they prefer to ask anonymously. To protect their privacy she uses a question box in class where her students can submit questions and have them answered without being identified. On more than one occasion students have submitted questions that Ms. Daniels has not been able to answer. When this has happened she has posted the questions on the KNOW discussion board. Ms. Daniels reported that she has received answers to her questions in a timely fashion and feels confident that the answers she has been given by her colleagues have been accurate and appropriate for her students.

Her use of KNOW during the face-to-face workshops is also primarily focused on interacting with her colleagues through the discussion board. Ms. Daniels said she prefers using the discussion board during the workshops because she knows other teachers are posting messages and therefore it is more worthwhile for her to take the time to log in. Another common activity at the workshops involves looking at different parts of the curriculum on the KNOW site. Ms. Daniels reported that this wasn't particularly helpful for her since she had a hardcopy of the curriculum and she preferred using that version to review the unit.

Discussion

Several design implications can be gleaned from these three teachers. First of all, Ms. Bradley's inability to customize documents means that she is unable to localize the curriculum to meet her needs. This inability to customize learning for her students is in direct contradiction to what KNOW is intended to do. We plan to address this inconsistency by developing an area on KNOW that will house templates for various documents such as student worksheets, lab packets and quizzes. These templates will simultaneously give teachers a framework to follow in creating documents consistent with the tenants of inquiry-based learning and allow them to tailor the materials for their students.

Another issue raised by Ms. Bradley pertains to her inability to access relevant content that was generated by someone other than herself. It seems logical that we would want to disseminate the knowledge and expertise possessed by teachers like Ms. Bradley through KNOW. However, by providing content developed by these expert teachers we inadvertently made the site less useful to teachers like Ms. Bradley. Therefore, we need to make sure we populate KNOW with content from a wide-range of resources. These may include links to relevant websites, ideas for alternative activities and connections to the latest research related to the teaching of science and inquiry based learning.

The technological problems each teacher had with viewing movies is certainly not unique to KNOW. There simply isn't a foolproof method for providing video online and outdated software coupled with slow or unreliable Internet connection will continue to exacerbate this problem for the foreseeable future. To ameliorate the problems people are having we produced curriculum specific CDs that house all the movies for that particular unit as well as updated

versions of the software we require to play the movies. The CDs work in conjunction with KNOW so that when a user tries to access a movie on KNOW the computer checks first for the presence of the CD. If the CD is inserted the movie is played directly from there, which circumvents the arduous downloading process. This remedy isn't ideal but we believe it significantly reduces the potential problems users may encounter and we are interested to see how it may impact the viewing of videos on KNOW.

Mr. Jackson's concern that he was missing crucial information by not being present at the workshops provides another design challenge. KNOW needs to more adequately capture and reflect what happens at the face-to-face workshops so teachers like Mr. Jackson don't feel like they are missing out. One step we can take towards this goal is to implement a more systematic procedure for collecting the many resources shared at the workshops and insure that those materials are shared with others via KNOW. This could include scanning documents, taking digital pictures or video and posting a detailed summary of each workshop on the discussion board.

In addition to making modifications to KNOW we have decided to make some changes to our needs assessment survey as a result of this first round of data collection. Users are no longer asked about their anticipated usage of the different features on KNOW. We also eliminated the questions that asked users to rate their skill and comfort level with computers and technology as we found it difficult to draw any meaningful conclusions from the answers to these questions. In addition, to expedite our data collection we created an electronic version of the needs assessment survey. As users log on to KNOW for the first time they are asked to complete the survey. Results are compiled and aggregated on an ongoing basis so that we can maintain a clear picture of our user population. We also have the capability to administer surveys to a select group of users based on their usage patterns, curriculum affiliation, demographic setting or any other criteria we specify. For instance, logging records may reveal a particular group of users making extensive use of the discussion boards. We could create an electronic survey specifically for this set of users to help us better understand their motivations for using the discussion boards and learn more about the community that might be forming as a result of this communication.

We were not surprised to find a direct correlation between activity on KNOW and the face-to-face workshops. For many of the teachers in our sample the workshops represent their only experience with KNOW. Interestingly enough, the feature utilized most often at the workshops is the discussion boards, a feature intended to allow teachers to communicate and collaborate from a distance. It appears that this directed usage is beneficial for users in more than one way. Mr. Jackson is able to participate at least partially in the workshops by reading the many posts generated in his absence. Ms. Daniels finds greater satisfaction in accessing the discussion boards because she knows people are populating them with comments, ideas and questions. In her role as lead teacher Ms. Bradley asks teachers to post updates on KNOW detailing where they are in the unit so she can quickly assess how each teacher is progressing through the curriculum. It remains to be seen what kind of impact this directed usage will have on the formation of a more permanent community of learners.

Conclusion

Our next step in this series of research is to build upon the work of our colleagues (Fishman, Marx, Best, & Tal, in press; Kubitskey, Fishman, & Marx, 2002) and investigate the link between professional development, specifically online PD, and student learning. The real test for KNOW will not only be its ability to sustain a viable community of learners but its ability to positively impact student learning.

We are also interested in exploring the impact of the design changes discussed in the previous section. It is our steadfast belief that teachers will make use of KNOW if it is viewed as a value to them. This means providing them with learning opportunities beyond what is available in the printed curriculum and making it easily accessible so that it is viewed as a worthwhile use of their time. We acknowledge this as an auspicious challenge, but contend that in order for online PD to become a viable alternative for the development of *all* teachers it is a challenge that must be met.

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Appendix A

KNOW Anticipated Needs Survey

Part One of Four

The following questions deal with your teaching background and experience as well as your current teaching assignment.

1. What subject(s)/grade(s) are you currently teaching?

Subject(s): _____

Grade(s): (✓ all that apply)

5 6 7 8 9 10 11 12

2. How many students will you be teaching the unit(s) to?

Number of Sections: _____

Average Class Size: _____

3. How many computers are available for your students in each of these locations and what is the Internet connectivity like in each location?

Answer only for locations where students will use computers for the hi-ce units. Write "NA" (not applicable) if a location is not used.

	Number of Computers Present	Internet Connectivity?		The Internet connection at this site is reliable.		
		No	Yes	No	Usually	Yes
My own classroom _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School library/media center _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer lab _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mobile Computer Cart _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Typically, how many students operate any one computer at one time during a class? ✓ the most common arrangement, or ✓ two if two are equally common.

- a. One student
- b. In pairs (2)
- c. In groups of 3-4
- d. Other (Please specify): _____

Part Two of Four

The following questions deal specifically with your access to, and use of, computers.

5. For how many years, if at all, have you had access to a computer at **school**? Internet connection? If you don't have a computer or Internet connection at **school**, please write "0".

- a. Computer at **school**..... _____ Years
- b. Internet connection at **school**..... _____ Years

6. For how many years, if at all, have you had access to a computer at **home**? Internet connection? If you don't have a computer or Internet connection at **home**, please write "0".

- a. Computer at **home**..... _____ Years
- b. Internet connection at **home**..... _____ Years

7. If you have Internet connection at **home** what speed is your connection?

- a. Dial-up modem (phone line)
- b. Broadband (cable modem/DSL)

8. How much experience have you had with each of the following types of computers?

	None	A little	Moderate Amount	Very experienced	Expert level
Windows/DOS PC (IBM style)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Macintosh	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Apple II series	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. We would like to assess your current **skills** related to using computers and the Internet.

I know how to:	No	Somewhat	Yes
use a web search engine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
participate in a discussion board or online chat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
compose, send and receive e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
download and install software from the web	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
download and view documents/files from the web	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
install software from a disk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
copy files from one disk to another	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
create and edit a word-processor document	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
create a slide show presentation (i.e. Power Point)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
create a new database and enter data into various fields	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
program my own software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
create a web page	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. We would like to assess your current **comfort level** related to using computers and the Internet. ✓ the statement that best describes your feelings towards each activity.

Activity	I am not at all comfortable doing this	I am not very comfortable doing this	I am somewhat comfortable doing this	I am very comfortable doing this
use a web search engine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
participate in a discussion board or online chat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
compose, send and receive e-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
download and install software from the web	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
download and view documents/files from the web	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
install software from a disk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
copy files from one disk to another	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
create and edit a word-processor document	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
create a slide show presentation (i.e. Power Point)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
create a new database and enter data into various fields	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
program my own software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
create a web page	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part Three of Four

The following questions deal specifically with your involvement with the hi-ce unit(s).

11. Which of the following hi-ce units are you planning on teaching next year? (✓ all that apply)

- a. Air Quality
- b. Water Quality
- c. Communicable Disease
- d. Big Things (simple machines)
- e. Helmets (physics)

12. What month do you plan to start teaching each unit?

	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Air Quality									
Water Quality									
Communicable Disease									
Big Things (simple machines)									
Helmets (physics)									

13. Which of the following statements best describes how you became involved with the hi-ce unit(s)?

- a. I received information about hi-ce while attending a workshop.
- b. My building/district administrator gave me information about hi-ce.
- c. My building/administrator asked me to attend a workshop about hi-ce.
- d. A colleague gave me information about hi-ce.
- e. The hi-ce unit(s) have been adopted as part of our curriculum.
- f. I was contacted by U of M about the hi-ce units.
- g. Other (please explain) _____

14. Which of the following statements best describes your decision to teach the hi-ce unit(s)?

- a. Teaching the unit(s) was an option for me.
- b. Teaching the unit(s) was an option for me but I was strongly encouraged to try them.
- c. Teaching the unit(s) was required for me.
- d. Other (please explain) _____

15. How often do you expect to participate in the following forms of professional development as you teach the hi-ce unit(s)?

Professional Development Format	Never	Once a month	1-3 times a month	Once a week or more	Almost daily
Saturday Workshop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For-credit coursework	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Study groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In-class support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Written Curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Focus Groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. If you were given the option to participate in any of the following professional development formats, which would you prefer to participate in most often? If there are two or more formats that you prefer equally, feel free to respond the same for both or all of them. It is **not** necessary that you rank the formats from highest to lowest preference.

Professional Development Format	I wouldn't participate in this format	I would participate in this format sometimes	I would participate in this format often	I would participate in this format very often	I would participate in this format each chance I had
Saturday Workshop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
For-credit coursework	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Study groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In-class support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Written Curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Focus Groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. Please indicate the frequency with which you have used the following online professional development resources.

Online Professional Development Resource	Never	Rarely	Sometimes	Often
Websites for subject related information/ideas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web search engines to locate subject related information/ideas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequently Asked Question (FAQ) features of educational or subject related websites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E-mail listservs to receive newsletters or updates from various organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussion groups that allow you to post and view comments and responses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online Coursework offered through a university or other organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. If you have used online professional development, how would you characterize your overall experience with these resources? If you have not used online professional development resources skip questions 18-19.

Online Professional Development Resource	Never Satisfied	Rarely Satisfied	Often Satisfied	Always Satisfied
Websites for subject related information/ideas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web search engines to locate subject related information/ideas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequently Asked Question (FAQ) features of educational or subject related websites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E-mail listservs to receive newsletters or updates from various organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussion groups that allow you to post and view comments and responses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online Coursework offered through a university or other organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Please use the space below to further describe your experience with online professional development. Explain why you have been satisfied/dissatisfied and whether or not you find it an effective way to learn. For instance, do you usually find the information you need in a timely fashion?

20.

21. What do you hope to gain from online professional development? (✓ all that apply)

- a. Strategies for implementing the curriculum
- b. Increased understanding of content specific material
- c. Assessment techniques and alternate ideas
- d. Strategies for teaching with inquiry based learning
- e. Strategies for teaching with technology
- f. Monetary compensation
- g. To earn CEU's/fulfill certification requirements
- h. Opportunities for peer collaboration/interaction
- i. Other _____

Part Four of Four

The following questions deal specifically with the KNOW website that has been developed at the University of Michigan. KNOW has been designed as an online professional development resource to support teachers using the hi-ce units.

22. Place a ✓ in the box that best matches your anticipated use of each feature. Please make sure to ✓ a box for each feature.

KNOW Feature	I wouldn't choose to use this feature	I don't anticipate using this feature much	I anticipate using this feature occasionally	I anticipate using this feature often
Downloadable curriculum:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Download and print the entire unit including student readers & worksheets 				
Student work samples:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> View samples of student work Read teacher comments about each piece of work 				
Videos:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> View teacher demonstrations, software tutorials & classroom enactments 				
Downloadable software:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Download software associated with each unit Download software updates associated with each unit 				
Lesson-by-lesson content:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> View each lesson with individual lesson objectives, materials, assessments and instructional sequence Links to relevant videos, student work and teacher helpful hints are organized within the lesson 				
Teacher testimonials & hints:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Comments, tips and alternative ideas from teachers who have taught the units before 				
Discussion board:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> A forum to communicate with other teachers using the units. 				

23. What other feature(s) not already mentioned would you look to find on a website like KNOW in order to help you teach the hi-ce unit(s)?

24. Please select one of the KNOW features from item 21 that you consider to be valuable. Use the space below to explain why that feature is important to you. Include in your response any specific uses you anticipate for this feature.

25. **Where** do you anticipate using KNOW?

- a. At school primarily
- b. At home primarily
- c. Both home and school equally
- d. Other _____

26. **When** do you anticipate using KNOW? (✓ all that apply)

<u>Time of Day</u>	Minimal use	Less than 25% of use	25-50% of use	At least 50% of use	Primary use
Early morning (before school)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
During school hours (prep period)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After school hours (afternoon)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Time of Week</u>					
During the week (Monday-Friday)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
On the weekend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

27. How often do you anticipate using KNOW while you are teaching the hi-ce unit(s)?

- a. Almost everyday
- b. 1-3 times per week
- c. 1-3 times per month
- d. Very rarely

28. What kind of reform or school improvement efforts are you involved in at your school?

29. How central are these efforts to your work?

Thank you for taking the time to complete this survey. Your answers are very important to us and we appreciate your participation.