Assessing the Impact of a Large-Scale Online Teacher Professional Development Community

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Abstract: TAPPED IN™ is an online community that supports teachers' professional growth through both formal education and professional development programs provided by a coalition of partner organizations and informal activities that occur year-round. The authors of this paper are members of both the community and a research team investigating whether and how the design of our online environment can help foster a culture of learning within a large and diverse community of education professionals. The community is now three years old, and we believe it is time to examine its impact more closely. In this paper, we review data collected from a survey that was recently sent to the educators in the community. Specifically, we examine how experiences in TAPPED IN affect teaching and teachers.

Overview of TAPPED IN

The concept of *community of practice* has become a major theme of teacher professional development (TPD). Advocates claim that communities of practice can be powerful catalysts for enabling teachers to improve their practice (Lieberman, 1996; Hawkins, 1999) and for innovative TPD efforts to achieve sustainability and scalability (Schlager & Schank, 1997; Schlager, Fusco, & Schank, in press). Currently, professional development in the teaching profession differs from that in most other professions in that the process is heavily skewed toward pockets of formal, highly structured activities outside the context of their actual work (Loucks-Horsley, Hewson, Love, & Stiles, 1998).

Similarly, most teacher education programs provide students with little access to the larger community of education professionals outside the university, at best providing internships at a local school. To understand the profession and become contributing members of the teaching community of practice, preservice teachers need access to that community on a sustained basis. Although we cannot change school policies or find more time for professional development, TAPPED IN, as an education community of practice, can help provide opportunities and mechanisms for teachers of all levels to overcome their isolation and make more effective use of time spent on professional growth.

Our view is that professional development is a lifelong process in which teachers' needs change from year to year. Our goal is to begin supporting teachers during their preservice education and continue to serve them as they become leaders in their professional community. We envision a year-round TPD process that balances formal TPD efforts and informal professional activities that are characteristic of other professional communities of practice. Our approach is to invite organizations representing divergent perspectives to be tenants in the TAPPED IN environment and use it to help accomplish their own TPD agendas. In this way, online tools and practices become part of their institutional culture rather than tangential add-ons. If one tenant organization leaves, another can take its place, and the community continues evolving over time as individual groups form and disband and projects begin and end. Each organization leaves behind a bit of its expertise in the form of members who continue to participate in the community, thus enabling the community to become an ever-widening source of expertise.

We currently support a growing community of 15 organizations and over 6,000 members. On any given day in TAPPED IN, one can observe teachers, administrators, district coordinators, state staff, staff developers, university faculty, graduate students, undergraduates, researchers, and the occasional curious guest being resources for one another. Members can be central or peripheral participants in the community. This

ability to participate peripherally (Lave & Wenger, 1991) in the activities of others (both as a resource and as a seeker of assistance) is a hallmark of a community of practice and one that we believe is essential to establishing and sustaining professional relationships. By sharing space in TAPPED IN (as opposed to locking teachers into their own proprietary environments), the organizations enable their teachers to have rich interactions with a wide variety of other educators.

Our technology is a platform-independent, Web-based, real-time environment designed to meet the needs of a large and diverse community of education professionals (see Schlager & Schank, 1997, for a more complete description: http://www.tappedin.org/info/cscl97.html). Activities occur in virtual rooms that provide a basic yet powerful set of communication mechanisms (directing speech to specific people, whispering, paging, emoting) and support tools (whiteboards, notes, tape recorders, and Web viewers). The structure of the TAPPED IN community and its environment allow great flexibility in designing opportunities for pre- and in-service teachers to interact with one another and share information, both within and across institutional boundaries.

As technology proliferates in schools, the issue of how best to prepare teachers to use it effectively to support their learning and that of their students has come into the fore. For educators to embrace technology and integrate it into their classrooms, they must explore, experiment, and collaborate as a community. We have designed TAPPED IN to be a place that encourages ongoing experimentation and collaboration, and that offers immediate support to teachers as they learn the ropes of both the technology and the community. The TAPPED IN community has been growing for over three years. Since we began conducting community-wide activities, an average of 15% (with a range between 10% and 20%) of members log in at least once each month. In this paper we will present a summary of who our members are, what kinds of activities they engage in online, and how they use technology in their classrooms. In addition, we examine the relationship between how often a member logs in and their perceptions of the benefits they gain from their TAPPED IN experiences. Though a time investment is required before most users become comfortable with the environment, we believe (and many of our experienced members tell us) that the return is well worth the effort. We hypothesize that those who rate themselves as more frequent users of TAPPED IN will report lower levels of professional isolation and positive effects on their knowledge of subject area and teaching techniques.

Survey Collection and Data

Our survey was developed to help us learn who our members are and how their experiences in TAPPED IN have affected their professional lives. We invited every member of the community to fill out a 133-question survey. We are collecting data on (a) standard demographics and professional development activities, (b) technology use, and skill rating, and (c) TAPPED IN use, affordances, and barriers. We began collecting data on August 30, 1999, online through Web-based forms (available to members at their convenience). We made available a .pdf file for members to download and mail or fax back to us. We also offered to Email, fax, or mail a hard copy of the survey to any member who requested it. Two announcements were Emailed to all the members of the community; reminders were also included in the monthly e-mailings and on the log-in page. The data being examined in this paper were collected through October 28, 1999. Data collection is still ongoing; the reader should consider this paper as a preliminary look at the survey results.

The demographics of the survey sample closely match the overall membership. The data set includes 851 survey responses from 282 males (34%) and 550 females (66%); 19 respondents did not specify gender. The gender breakdown of all members (as of 11/29/99) is 4188 females (64.9%) and 2262 males (35.0%). Average age of the respondents was 43.72 (SD = 9.74), with a range of 21-67. Table 1 shows that the sample's breakdown is comparable to that of the entire community, and that the sample represents the different occupation categories in TAPPED IN. Although the majority of members are teachers, we believe that it is important to have a diverse community of education professionals. Having administrators, librarians, subject area experts, professional development organizations, and others online allows for informal conversations where ideas can be exchanged. In addition, we have a wide range of experience among the teachers. The respondents who listed teaching as their primary occupation have taught from as little as half a year fulltime to 39 years full time with 25% having taught 5 years or less, 50% having taught 13 years or less, and 75% having taught 21 years or less. Table 2 shows that the different subject areas taught by the teachers in TAPPED IN represents a cross-section of the teaching profession.

In terms of technology skills, 2.2% of respondents rated themselves as having minimal Internet skills, 21.5% as having moderate, 48.5% as having strong, and 27.8% as having expert Internet skills. Table 3 presents information about reported online technology use by our respondents, and Table 4 presents information about the use of computers by teachers in relationship to their classroom.

Occupation	n	Percent of respondents	Population as of 9/99
K-4	98	11.8	18.9[a]
5-6	64	7.7	11.4[a]
7-8	58	7.0	
9-12	125	15.1	13.9
K-12 Teacher (total)	(345)	(41.7)	(44.4)
Community College	12	1.4	n/a
School of Ed. Faculty	27	3.3	2.5
University Faculty (other)	32	3.9	4.4
Library/Media Specialist	37	4.5	5.5
Professional Dev. Staff	31	3.7	4.9
Tech. or Curr. Coordinator	83	10	2.5[b]
School Administration	28	3.4	3.8
15 other occupations on survey	41	20.0	
Other	64	7.7	20.1
Missing	23	n/a	n/a

[a]Because of differences in the wording of occupations, we can't be sure how teachers classified themselves in grades 5-6. On our membership form 18.9% identified themselves as elementary teachers, and 11.4% that identified themselves as middle school teachers on our membership form. On the survey, the grades were specified.
[b]Just Technology Coordinators.

Table 1: Survey respondent occupations as compared with occupation breakdown of the community of TAPPED IN.

Multiple Subjects	168	Computing	104	Physical Education	25
Science	122	Programming	11	Industrial Arts	7
Language Arts	82	Mathematics	109	Foreign Language	19
Fine Arts	46	Social Studies	92	Other	46

Table 2: Subjects taught by the respondents in the 98-99 school year (respondents could select all that applied).

	Percent of respondents				
How often do you do the following?	Never	Once or twice	Monthly	Weekly	More often than weekly
Use email	0.1	0.2	0.1	2.7	96.8
Access the WWW	0	0.1	7.8	7.1	91.9
Use WWW search tools	0.1	1.0	4.4	15.0	79.5
Participate in Listservs, Discussion Boards or Newsgroups	11.9	15.5	10.4	11.7	50.4
Participate in online chat rooms other than TAPPED IN	33.9	33.1	15.4	9.0	8.6
Participate in an online commuity other than TAPPED IN	39.0	26.1	11.4	9.7	13.8

Table 3: Frequency of selected online activities of survey respondents. (The n's for the questions range from 832 to 837.)

In which of the following ways do you use computers to prepare for teaching your classes or in other professional activities?	Percent of respondents				
	Never	Once or twice	Monthly	Weekly	More often than weekly
Record or calculate student grades	25.2	8.1	9.6	17.3	39.8
Make handouts for students	1.2	3.4	11.4	30.3	53.6
Correspond with parents	15.7	17.2	29.7	19.9	17.4
Get information or pictures from the Internet for use in lessons	5.3	7.0	12.4	31.3	43.4
Use camcorders, digital cameras or scanners to prepare for the class	33.9	33.1	15.4	9.0	8.6
Exchange files with other teachers	39.0	26.1	11.4	9.7	13.8
Post student work, suggestions for resources or ideas	34.0	25.9	16.5	11.8	11.8

Table 4: Frequency of computer use by teachers on professional activities. (The n's range from 405 to 412.)

Barrier	N	Mean	SD	Barrier	N	Mean	SD
Lack of computer at school	808	1.42	.93	Difficulty learning the TAPPED IN commands	804	2.1	.92
Lack of computer at home	809	1.2	.66	Not comfortable with real-time (chat) interaction style	808	1.68	.95
Lack of Internet access at work	802	1.48	1.01	Difficulty arranging to meet others in TAPPED IN	805	1.85	1.02
Lack of Internet access at home	806	1.21	.70	Lack of time to participate in online activities	820	2.85	1.09
Lack of experience/skill using the Internet	804	1.21	.54	Lack of administration support for it at my workplace	796	1.68	1.05
Difficulty logging into TAPPED IN	817	1.71	.94	Lack of useful resources or activities	790	1.5	.83
Having to type to communicate	800	1.42	.72	Lack of online help from TAPPED IN staff	788	1.25	.63
Difficulty learning to navigate the environment	804	1.98	.92				

Table 5: Average ratings of barriers to using TAPPED IN for the whole sample. The question asked was, "Which of the following are barriers to participating in TAPPED IN?" Possible responses: 1=Not a Barrier, 2=Minor Barrier, 3=Moderate Barrier, 4=Major Barrier

Impact of TAPPED IN	R	N
Reducing professional isolation	.47	789
Professional Relationships	.48	789
Participation in professional discourse with other educators	.49	786
Changes in how I teach	.37	782
Changes in what I teach	.32	786
Knowledge of new subject matter	.37	784
Use of technology in my teaching	.35	779
Ability to find web resources	.31	793

The scale for the independent variable of how often have you logged into TAPPED IN was: 1=Never, 2=Once or Twice, 3= Less than one a month, 4=At least once a month, 5=At least once a week, 6=More than once per week. The scale for the dependent variables was: 1=Very negative, 2=Somewhat negative, 3=No impact, 4=Somewhat positive, 5=Very positive. Higher values of R indicate a stronger relationship between the time spent online and the positive impact that members report from TAPPED IN.

Table 6: Correlation between how often a member logs in and impact of TAPPED IN.

Correlations were computed between the self-reported data of how often a member logs in and the perceived impact that TAPPED IN has in different areas of an education professional's life to test our hypothesis that the more time spent online, the greater the perceived impact. We report Spearman's Rho correlations. See Table 6 for the actual areas of professional life and for correlation coefficients. All of the correlations reported differed significantly from zero ($p < .0001$).

Discussion

Our survey was developed to help us learn more about our members. We were pleased to learn that we have teachers with all levels of experience in TAPPED IN, from the brand new teacher to the experienced veteran of 39 years. We learned that 75% of the respondents rated their own Internet skills as strong or expert, and that 96.8% used email, 91.9% accessed the WWW and 79.5% used WWW search tools more often than weekly. In addition, the teachers also reported using technology in many aspects of their profession. Over 65% of our sample record or calculate student grades using a computer monthly or more often; 95% of our sample make handouts for students using a computer monthly or more often; 80% get information or pictures from the Internet for use in lessons monthly or more often; and 60% correspond with parents using a computer monthly or more often. Smaller percentage use camcorders, digital cameras or scanners to prepare for the class (33%), exchange files with other teachers, post student work (35%), suggestions for resources or ideas or activities (39%) at least monthly. Our findings suggest that our members are more frequent and facile users of technology than one would expect in the overall teaching population. Becker's (1999) national survey of teachers' technology use collected in Spring of 1998 indicated that 68% of teachers had used the Internet to find information for lessons, and 28% of teachers did this more often than weekly. Over 95% of our respondents used the Internet to gather information for their lessons, and 43.4% of our respondents did this more often than weekly. One difference that must be considered is that our data were collected a year and one-half later.

What motivates people to use and prevents people from using TAPPED IN for online professional development are two areas we hope the survey will elucidate. In this paper we focused on the barriers. Respondents indicated that lack of time for online activities was rated the most significant barrier that inhibits their use of TAPPED IN. Although online interactions can decrease the time needed for attending a meeting (by eliminating driving time), there are still a finite number of hours in a day. Time can be made available through more professional development days, by paying for time over the summer, or by offering credit (which can result in salary increases), but these are things that will need to be considered at the level of school districts and states. Future analyses will focus on organizations that are currently providing incentives (stipends and district credit) for their members' use of TAPPED IN to determine whether that helps lower the barrier of lack of time. We hypothesize that when online interactions are a central or required part of professional development, time becomes less of a perceived barrier. When online interactions are another activity that teachers would like to take part in, they receive less priority and become one of the items perpetually on that "list of things to do." In addition, we believe that providing credit or a stipend for the first few times online when the learning curve is steepest may reduce the feeling that this is "wasted" time.

The next two most highly ranked barriers, difficulty learning the commands and difficulty in learning to navigate TAPPED IN, are issues that we as designers are working to resolve. We are developing a "newbie" (new person) interface to scaffold the experience for new or infrequent users. We hope these efforts will help reduce some of the time necessary to feel comfortable online. Technological advances and standardization in Java and Web browsers will help us address our fourth most significant barrier, difficulty in logging into TAPPED IN. We have a one-click log-in process, but because of differences in Web browsers and versions of browsers it is difficult to develop a client that works smoothly for all versions, and some members experience difficulty. The fifth most significant barrier cited by our respondents is lack of administrative support for online activity. We, and many others, are working to change this situation by demonstrating the benefits of using technology and integrating it into the daily lives of both education professionals and their students.

The results from this initial exploration of our survey data support our belief that online professional interactions have a positive impact on educators. We found evidence that the more often a member logs in (based on self-report), the greater the perceived reduction of professional isolation and the higher the positive impact on teaching practices (e.g., how I teach and what I teach). Getting teachers to experiment in the classroom is viewed as the first step toward that end. First, teachers must be aware of options for adjusting their practice. Next, they must make a change in content, method, or some other facet of their teaching. Whether the change can be deemed an improvement in teaching is not measurable by our data. Our data indicate only that members report a positive impact on changes in how and what is taught, the use of technology in teaching, knowledge of subject area resources, and knowledge of new teaching techniques and that these impacts are correlated positively with increased TAPPED IN use.

These preliminary survey findings are consistent with the anecdotal reports we receive from members each week, the observations staff make each day, and the more formal reports we receive from our partner organizations each year. Our future analyses will identify factors that contribute to the overall positive perception of TAPPED IN. We will examine the large section of the survey devoted to which activities in TAPPED IN were valuable to members and how frequently members participated in activities. We will also be investigating the relationship of group membership (which organization a member is affiliated with). Some of our partner organizations offer a stipend or credit for participation in TAPPED IN, and we will examine the effect of this practice on the barriers to participation and the perceived benefits of TAPPED IN. We will continue to report our findings and make adjustments to our community design as we continue to develop our model for professional development.

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