Cornerstones for an On-line Community of Education Professionals
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In a prior issue of Technology and Society [1], McFarland argues that we should not view the Internet as a superhighway, but rather as a gathering place, or *agora*, that "brings people together, encourages participation, and supports creativity," a place that is "always growing, adapting, and changing in response to new ideas and initiatives." We agree with McFarland's metaphor and quibble with only one point. We believe that many of the key social issues raised by McFarland—what form of governance and facilities are needed to support cooperation and group work; how can people with similar interests find one another; how are the benefits and costs of the system shared equitably; and how to foster cooperation and trust—cannot be addressed solely at the level of the Internet as a whole.

We propose viewing the Internet as a landscape containing many gathering places and addressing both design and social issues from the perspective of each individual place and the community that shapes it. Different kinds of public gathering places, or *third places* as Oldenburg [2] calls them, attract and serve the needs of different groups of people both by design and adaptation. We have been working in a small corner of the Internet for the past two years to create a third place for practitioners of a particular profession—education. Our goal is to learn how to grow a self-sustaining on-line community of education professionals that supports and enhances the professional growth of it members over the length of their careers. In that respect, our third place is intended to be both workplace and informal gathering place. In the spirit of McFarland's search to find an appropriate metaphor, we have found that a *coral reef* might best describe how we are trying to grow a diverse and thriving community [3].

The technology underlying our on-line environment is of general applicability. Yet, we believe we have tuned it to fit the particular needs of this community. We are not out to push the technology; many others are pushing hard enough. We are trying to enable as many education professionals as possible to participate *right now* in the kinds of on-line activities that we believe will be commonplace several years from now. Our technology development approach is to stay one step ahead of teachers at the right tail of the technology power curve, while supporting those at the left tail as they acquire new technology and the skills to use it.

Our environment is built on two core technologies that have been in common use for several years—telnet-based multi-user virtual environments (MUVEs) and the Web—making the system cross-platform compatible and accessible by any computer that has Internet capabilities.[1] An optional Java client applet (called TAPestry) enables those with appropriate bandwidth and horsepower to gain a few added affordances. In a few years, commercial technology will likely overtake our technology platform. By starting now to develop and practice new models of professional interaction on-line, we

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[1] We give credit for many of our environment's basic features to Diversity University Inc., Dr. Ken Schweller, and anonymous MOO wizards who contributed to the several generations of Jay's House and LambdaMOO cores. Our developers, Dr. Patricia Schank and Richard Godard, have given back to that community several new design concepts and functions.

believe that the teachers in our community will be better prepared to select and employ emerging technologies effectively to support their own professional growth as well as the learning of their students.

We refer the reader to [3] (http://www.tappedin.org/info/cscl97.html) for a more in-depth description of the theoretical considerations and practical design constraints used to develop the on-line environment that supports the community. In the balance of this article, we focus on how our concept of an on-line community of education professionals and the community itself have co-evolved over time, each feeding the growth of the other.

The Informal Nature of Professional Development

To better understand the needs we set out to address and the rationale behind our design, we begin with an admittedly oversimplified scenario that we hope illustrates some of the unique constraints of professional development within the K-12 teaching profession. In most professions, professional development is predominantly an informal process that occurs in the context of daily practice. Professionals take for granted the autonomy, tools, and workplace conditions needed to manage and sustain their own professional growth. Imagine a day in the life of a "typical" veteran engineering professional named Maria. What might Maria do when she has an unexpected technical problem and needs another's perspective to work through it, wants to brainstorm an idea with a few colleagues, or discovers a new technique that she wants to share? She might fire off an email to a newsgroup, pick up the phone to consult with a colleague, or meet some colleagues around a whiteboard in the hallway. If her company has a sophisticated intranet, she may even get on-line with a colleague at another location.

From time to time, Maria needs to learn a new programming technique, get up to speed on a new software package, or satisfy some other professional development goal associated with a new project or career advancement. She might set aside some time to close her door and "play" with the new software, modify some sample code she found on the Web or in the latest book on the subject, or ask a colleague to walk her through some examples. She might form an ad hoc group with a few colleagues who are also interested in the topic. Only as a last resort, Maria would submit to leaving her work to attend a 5-day training seminar at some local hotel or her company's training center.

Now, imagine that Maria moves to a new company where she can no longer walk down the hall to consult a more knowledgeable colleague because she is the only software engineer who knows about the latest techniques. Maria has no telephone in her office to call a colleague because she has no office. The only computer Maria has access to is available to her after hours only when her staff and colleagues have gone home. Finally, imagine that her company cannot afford to pay for the book or allot the time she needs behind closed-doors to figure out the new software package or technique and pass that knowledge on to others. Instead, she is required to attend a course six months from now taught by a consultant who disappears after the course is over. When Maria returns from taking the course, she will be responsible not only for applying what she learned, but also training her (unmotivated) colleagues. She receives no time, resources, or compensation for this added responsibility. On occasion, the company pulls her away from her job to attend workshops that have little impact on her job, except to disrupt her work schedule. And, until Maria comes up to speed on the

new technology, the company assigns her a part-time teenager to run her equipment. (The teenager has not received better training than Maria but has had the time to learn the new techniques at home doing things that are relevant and personally rewarding, i.e., talking to friends and playing games.)

The Formal Nature of Teacher Professional Development

The latter depiction of professional development is a stereotypical collage of problems that is not far removed from common practice in the teaching profession. Teacher professional development (TPD) differs from most other professions in several significant ways. Traditionally, teachers are isolated from their peers (who may not be in their own school) during the workday and have little access to, or support for, the kinds of *informal* learning opportunities that most of us take for granted [4]. Professional development for teachers is heavily skewed toward pockets of formal, highly structured activities outside the context of their actual work [5]. The predominant approach for disseminating new knowledge and skills is the "train the trainer" model, which rarely scales up to reach the majority of teachers [6]. Research on teacher professional development suggests that teachers need more opportunities to access and discuss exemplary reform-based materials, co-construct and publish resources for new teaching practices, and collaborate on the creation of locally relevant solutions [7], [8]. Teachers need to participate in professional communities of practice [5], [9] that are more like other professions.

Although we, as technology application developers, cannot change school policies or find more time for teachers, we *can* help provide opportunities and mechanisms for teachers to overcome their isolation and make more effective use of the time they spend on their own professional growth. This goal has led us to partner with several nationally-recognized education organizations, educational website hosts, preservice teacher education programs, local and state education agencies, and innovative teachers to jointly establish a new on-line TPD community concept called TAPPED IN™. The TAPPED IN environment went on-line in September, 1996 and both the community and the technology have been evolving ever since. Today (in October, 1998), TAPPED IN membership numbers over 2000 education professionals and 12 partner (or *tenant*) organizations (with a growth rate of approximately 100 new members a month). Our path has not been without obstacles and a few changes in course. Below, we attempt to summarize the co-evolutionary process that our vision and our community have undergone over the past two years.

Forming the TAPPED IN Concept—Two Initial Cornerstones

Recent advances in computer-based conferencing and Web-based information sharing technologies (including chat rooms, discussion boards, netcourse environments, video conferencing, profiling and search tools, 3D virtual worlds, synchronous application sharing software) provide capabilities that effectively support key aspects of collaboration and social interaction that are central to professional development (in any profession). The availability of these technologies suggests that any education organization can select from a menu of tools to support its own on-line community. While it is true that any organization can implement its own set of on-line tools, we do not believe that this approach will be effective in achieving a scaleable or sustainable on-line TPD community.

Viewing Internet technologies as tools to choose among (e.g., synchronous chat versus asynchronous email; listservs versus bulletin boards) perpetuates artificial distinctions that are not characteristic of the way that people work together. For example, myths such as "synchronous communication is good for social interaction while asynchronous is good for reflective discourse" or "real-time meetings are too hard to schedule, so a Web discussion board is the only mode of interaction needed in an on-line course" have arisen in on-line discourse largely as artifacts of technology limitations, with little empirical or theoretical foundation. Yet, like software bugs that have become features, these myths have become touchstones for education technology developers and district technology coordinators to support the use of a particular type of on-line technology.

One of our favorite anecdotes is the story of the asynchronous netcourse system developer who proudly told us how his resourceful students discovered that they could fire off emails to one another in rapid succession to approximate a conversation. Although the system clearly did not support one of the users' basic needs—that of real-time interaction—the developer defended the system by citing the advantages of asynchronous communication. It is not always easy to schedule a real-time meeting, but sometimes meetings are the best way to get work done, as those students demonstrated. Eliminating the opportunity for a group to decide on its own the mode of discourse that is most appropriate in a given situation by a priori omission of an entire channel of communication from a system does not serve the interest of collaboration or learning.

One cornerstone of our concept is that *an on-line environment should support the same ebb and flow of communication and information sharing that face-to-face work teams engage in over time.* Some work occurs in highly interactive group sessions and other work occurs individually. Information is shared in real time, by sending email, or by leaving documents in a central, persistent place. Group membership changes over time and groups disband. We are attempting to weave a set of on-line capabilities into a seamless collaborative work environment so that people are not bound by a predetermined set of tools, but rather choose the modes of communication and information sharing that best suit their needs in the context of their current work. In that context, people have little difficulty deciding whether a mailing list or a web-based bulletin board is more appropriate, when to hold real-time conversation or send email, or when to send documents via email, leave them in a virtual room for others to review later, or project the text of a document in real time. We do not claim to have achieved our goal of a fully integrated system, but we are moving toward it.

We also believe that isolated on-line environments provided by every education organization, large corporation, or local project will not achieve the rich variety of ongoing human interaction that characterizes thriving professional communities of practice. As one educational Website developer we spoke with observed, "there are 2000 educational websites out there with their own web bulletin boards, listservs, and chat rooms. They all want to be the place where all teachers go." The reality is that most will not be around very long ("the funding ran out" or "the company had to cut back") leaving the teachers on their own.

A second cornerstone of our concept is that *a scaleable and sustainable TPD community of practice requires the participation of several organizations representing a variety*

of approaches and perspectives. Teachers shouldn't have to ascribe loyalty to one vendor's Website to the exclusion of others; nor should they have to join a host of different on-line communities (with different interfaces, tools, and norms) to find new colleagues, information resources, or activities. Our approach has been to invite education organizations and local education agencies to be tenants in the TAPPED IN environment and use it to help accomplish their own agendas with their own teacher affiliates. By sharing TAPPED IN, the organizations enable their affiliated teachers to gain access to expertise, ideas, and resources that no single organization could provide by itself. In return, the organizations gain access to a pool of teachers that are ready to work effectively on-line. As funding runs out for one project, another takes its place; the community lives on because the teachers are the glue that holds it together, not the organizations.

Implementing the Concept—Two New Cornerstones Emerge

We began the process of assembling the core tenants in the summer of 1996. Our initial goal in the start-up phase was to bootstrap the community by assisting 4 TPD organizations to adopt the TAPPED IN concept and implement on-line activities that use TAPPED IN year-round to supplement summer institutes. The plan was that each organization would identify and train an initial cohort of teacher affiliates and begin to conduct on-line activities with them on a regular basis. Other teachers affiliated with the organizations would join in over time.

We soon discovered that the organizations' business models focused virtually all their effort on the summer institute window of opportunity. None of the organizations had the resources or expertise in place to host year-round on-line activities; nor did they have a clear understanding of how best to use the environment, the costs, and the benefits that they and their teachers could expect to gain. It would take many months, if not years, of incremental progress by each organization to re-invent its TPD approach and consequently years before TAPPED IN could hope to achieve the level of ongoing on-line activity that we believed necessary to sustain the community.

We had a chicken-and-egg problem. Teachers were immediately excited about the possibilities but had no compelling reason to log in on a regular basis. Most times, nothing was happening that related to their immediate needs and few resources resided in TAPPED IN that they could not find on the Web itself. We couldn't attract teachers to log in until the organizations ramped up their activities and content, and we couldn't reach a critical mass of activity without participating teachers.

This dilemma led to the third cornerstone of our concept—a *community can grow in the spaces between tenant organizations.* We realized that TAPPED IN must provide activities and services apart from those hosted by our tenants and that the community must serve groups and individuals who are not affiliated with our tenant organizations. To encourage and scaffold the participation of unaffiliated members in the community and encourage affiliated members to log in between their own organization's events, we added a community activities director to our team and expanded our services in several ways.

As word of TAPPED IN spread through listserv postings and conference presentations, we began to see unaffiliated teachers, school librarians, and faculty and

students from schools of education logging in as guests and subsequently joining the community. To support these members, we decided to provide free bare-bones offices (as opposed to custom-designed tenant suites). We began with 72 offices and have added 6 new floors. Over 300 of our 500 offices are now occupied.

Providing free offices also enabled us to attract small groups of education professionals (and scouting parties for larger organizations) looking for an on-line venue to hold group activities. We have developed partnerships with 8 new organizations that started out experimenting with the environment in this way. Engaging these organizations in dialogue in the context of their trial activities has enabled us to assess their readiness for on-line activities. Moreover, the organizations were able to develop trust in the technology and our ongoing support that is central to their and our success.

We have also established a class of on-line events called *community-wide* activities that both serve the community's needs and scaffold members as they learn to participate more fully in the community. With TAPPED IN staff and community *elders* serving as cyberspace *sherpas*, we are finding that teachers can discover for themselves how on-line activities can support their professional growth. One example of how we are scaffolding the community as it develops its own activities, goals, and identity is the model we have implemented for our *After School On-line* (ASO) discussion series. ASO is a weekly series of hour-long real-time discussions on topics suggested by the community and led by volunteers recruited from the community. The topics for the month are announced to all TAPPED IN members via our monthly newsletter, *…On the Tapis*, and on a Web calendar. Those wishing to participate simply log in at the scheduled date and time.

ASO has no full-time discussion moderator; teachers learn to conduct their own on-line sessions from participating and observing their peers. The discourse-support objects in TAPPED IN lend themselves well to planning and facilitating discussion. For example, leaders can prepare *notes* containing a set of discussion points in advance, which they can *project* to the other participants during the session. Some leaders outline an agenda or record ideas generated during the discussion sessions on the room's whiteboard. Another commonly used capability (though our TAPestry Java applet) enables one person to cause a web page to open on the computer screens of others in the virtual room. This feature makes sharing a favorite Website with a colleague very easy. Typically, sessions have attracted 4-6 participants, which is manageable for a novice leader.

The fourth (but clearly not final) cornerstone of our concept is the way the members of our fledgling community are helping us gain a better understanding of *teacher professional development as a life-long process that occurs in the context of daily practice* and turn those words into practice. For example, TAPPED IN recently began supporting a few school of education faculty experimenting with the environment. The participation of those faculty and their students has helped us grasp the need to situate community and its activities in the context of teachers' growth from preservice teacher education and initial certification through masters and Ph.D. programs for veteran teachers. One relationship has blossomed into a formal alliance between TAPPED IN and a university offering a Master's degree program for teachers. Master's students from around the country use TAPPED IN daily as their on-line meeting place. It is the

one place where they can be both professional colleagues *and* students of their profession.

The value of mingling preservice and inservice teachers in a single environment is illustrated by how one professor introduced her preservice students to TAPPED IN in the context of an educational psychology course. The initial assignment was to log into TAPPED IN over the period of a week to find resources and engage in conversations with educators they ran across. The next week, the professor arranged for the entire class to log in at one time, break into four groups, and hold a 1-hour discussion on a specific topic with one of four veteran teachers that the professor had recruited on-line. After the discussion session, the professor asked the class to reflect on their experience in writing. The following quotes are representative of the students' comments:

"I learned the most from conversing with [Teacher3] and my classmates ...her discussion of the stages a first year teacher goes through (e.g., anticipation, disillusionment, survival) has made me more prepared. I have heard that the first year of teaching can be a nightmare, because it is like learning how to swim by simply jumping in the water. I now feel like I know a little bit of what to expect and am prepared for what it will be like."

"With Tapped In, I saw how there are teachers who are dedicated to the professions. We often hear of teachers who are sick and tired, who get burnt out, and those who quit. It is often hard to hear stories of the teachers who spend extra hours at places like Tapped In to increase their classroom knowledge. That was definitely a reaffirmation to study the field of education."

Our members have also pointed to the need to *situate professional development activities closer to teaching and learning in the classroom*. Individual teachers are taking it upon themselves to conduct activities along with their students in TAPPED IN. Many have requested that we develop facilities that will enable them to bring their students into TAPPED IN. In response, we have built a Student Activities Center and a new class of membership for students. One recent After School On-line session sparked collaborative project over two months that involved teachers and students from California, Indiana, Pennsylvania, and Kentucky. The project culminated with an on-line civil rights forum attended by approximately 90 student participants.

By working together as a group on this project, the teachers gained new perspectives that they otherwise might have never experienced. The teachers learned technology skills as they learned how to organize and facilitate a meaningful and motivating on-line experience for their students. Equally important, they accomplished the project without outside intervention, funding, or formal structure. One teacher wrote in a recent email, "I am sure learning a lot about civil rights! I know the kids will benefit from the forum, but I feel like these planning sessions and discussions have helped me to become a better teacher."

We have also begun to question whether TAPPED IN should be for *teacher* professional development only. What about school librarians, for example? The profession of school librarian is busy trying to produce a new generation of librarians who are trained to work alongside teachers as digital media resource specialists. We are now trying to better understand the role that school librarians can play in TPD activities

and how they can be involved in the TAPPED IN community and the benefits they can derive from it.

Building the Foundation between the Cornerstones

To conclude, we raise some of the practical concerns associated with building a network of on-line communities. Because the focus of this magazine is technology's impact on *society*, we also indulge in some questions regarding the effects that such communities could have on the profession of teaching, education reform, and public schooling (we raise the lid on that can-of-worms only slightly).

The TAPPED IN model depends on a coalition of organizations to provide expertise and resources for teachers on-line year-round and to underwrite the cost of maintaining the community and environment. For the organizations, TAPPED IN has to be a more effective way to interact with their teacher affiliates, more cost-effective, and a useful recruiting tool. Some organizations are more successful than others in adopting TAPPED IN. We're learning from these experiences that on-line activities are every bit as difficult to plan and conduct as face-to-face activities; they require committed staff, adequate resources, and experience. On-line activities should not be considered a replacement for face-to-face activities, and organizations should not expect that if they build it, teachers will come.

The TAPPED IN concept will not be successful if education professionals don't find it valuable and choose to invest some of their own time and energy in learning to master both the technical and social challenges inherent in being a member of a community of practice. Based on user feedback, we are incrementally refining the user interface almost daily. We still have a way to go before we consider TAPPED IN to be a walk-up system. Today, one's first experience in TAPPED IN can be quite frustrating, which leads some to criticize the technology as too cumbersome or say that "teachers are not ready for this." We and our members disagree with that view. The current generation of teachers will be the last that we will have to help understand the power of the technology and train to use it. The next generation of educators will already feel comfortable with the technology because they are using it to interact with friends today. We hope to help bridge the two generations by helping today's teachers lead the way through the maze of *social* barriers to sustainable on-line communities.

For example, new members almost always attribute the problems they experience to the technology. However, as we analyze feedback from first-timers, it is becoming clear that the barriers to effective participation are as often social in nature as they are technical. The ways that many new users describe their confusions and frustrations are very similar to those expressed by people thrust into a new *physical* environment with people, tools, protocols, and social norms that are unfamiliar to them. We liken the experience to a foreign tourist needing to catch a train in Grand Central Station on Friday at rush hour. One of our members expressed her first experience as similar to:

"...the feelings one has when one enters the teacher's lounge for the first time. I remember those feelings of insecurity, fear of the unknown, not knowing the rules of participation, etc. But, I also remember how at least one of the experienced teachers stepped forward and made it her mission to help me become more comfortable. ...She became a friend, a confidante, and a vast resource of information on just about

everything. ...Perhaps, more of us more experienced users should assume these roles. ...There is no substitute for experience and that requires time and patience."

New members need to learn the ropes and more experienced teachers must show them through their example. Even so, real-time, text-based interaction is not for everyone. We do not expect 100% participation within any group, and we encourage group leaders to offer alternative forms of participation. We are pleased that approximately 20% of our members log in over any given month. Some members have never logged in and that too is okay with us; we hope that they will in the future when they see an activity that interests them (e.g., in the monthly email newsletter) or when we implement a new feature that lowers a barrier to participation (e.g., audio conversation). From another perspective, many of us belong to professional societies (e.g., ACM, IEEE, AERA) that we rarely if ever participate in actively. But we feel that we derive benefit from the association even if we only attend a conference or read the organization's periodical on occasion. Why should we expect different participation patterns for an on-line professional society of educators?

The community will always need an organizer and, as McFarland [1] points out, it may soon need a governing body. SRI fills the organizer role now; we are also the environment's architects and technical support providers. Although the community is dependent on SRI staff now, we will not consider TAPPED IN a success until the community can stand on its own. We take very seriously the need to help the community become self-sustaining. Together we are learning how to reach that goal; we share lessons learned continuously. We are currently too young to need a formal governing body or strict code of rules. As the community matures, we fully expect that governance will be necessary (if only to regulate the tenants!). Will the governing body be controlled by educators from the community or tenants who pay the bills? Over time, we expect some partner organizations to spawn their own TAPPED IN community environments, effectively creating a network of regional communities. Who will organize and manage the other nodes in the network that we envision: universities, regional education consultants, school districts?

Finally, we need to be careful what we wish for. What if the TAPPED IN concept succeeds beyond our wildest dreams? Will TPD be transformed to a more effective balance of formal and informal activities or will the public school system be affected in less positive ways? What happens when *all* the organizations that work with teachers want to be tenants in their regional TAPPED IN? Will it transform the gathering place from agora to flea market that is no longer hospitable to or useful for teachers? Will communities compete rather than cooperate? Will the ability to engage in TPD activities on-line cause school districts to reallocate TPD budgets and how? Will teacher's unions denounce the communities as competing with their interests or as a subtle way to get teachers to put in more hours without being paid?

High school students today can enroll in classes taught by teachers in a different state through the Web [10]. Universities are already offering courses on the Web to attract more students and revenue. Will teachers who attract more students into their online courses command higher salaries? Will these developments affect movements such as home schooling, charter schools, or commercial models for K-12 education? We do not claim to have answers (or even the right questions). But, we hope that those who

study these societal issues watch us out of the corner of their eye and help us make midcourse corrections on the chance that we do succeed in *getting* what we wish for.

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