

Why Good Design Isn't Enough for Web-Supported Communities: New Conceptions of Community Design

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“What makes for a successful online community is often poorly understood. At this time (1996), the tendency of those involved in building graphical virtual worlds is to create visually compelling worlds that look good, but do a poor job of fostering social interaction. Many of these systems have more in common with lonely museums than with the vibrant communities they set out to create.”

Over the last decade we have seen more and more instructional designers work towards crafting something like community. A fundamental premise of these efforts is that these designs will facilitate groups of individuals in coming together with the goal of developing relationships in which all members struggle with and construct notions of what constitutes meaningful practice. However, in general, we are still in our infancy in terms of understanding the dynamics that characterize and drive internet-supported communities of practice (CoP),

especially those in which a sponsoring body intentionally designs them to support a particular learning agenda. Although it is ten years since Kollock (1996, p.58) made the above opening quote, it still serves as a salient warning to those of us charged with designing web-supported communities of practice. Educators need to adopt new conceptions of what it means to design for community if they are to succeed in capitalizing on what community affords.

Many attempts to build online community may have failed because of the very design efforts meant to facilitate them. These efforts unduly focused on the implementation of fine grained design and highly structured web architectures while neglecting the social infrastructure that is at the heart of any community. Experience clearly shows that ‘good design’ in socially-oriented environments is neither held as a prelude to community nor enough in and of itself to stimulate and support community. Designers, managers and facilitators need to build more than a tolerance for the ‘messiness’ inherent in social systems, they must learn to leverage it. Issues of improvisation and balancing tensions arise as we consider how to plan for, and cultivate, sociability, emergence, participation and ownership.

This chapter presents, from the authors’ varied experiences, a set of critical considerations to move the reader toward a practical new conception of community design. Specifically, we draw on a number of practical experiences as well as those from literature, to communicate the ever-present tensions and the ways in which these tensions can be recognized and leveraged for effective web-supported community design.

Some key tensions are between:

- Content Transmission → Engaged Participation
- Open Participation → Bounded Participation
- Pre-Defined Structure → Emergent Structure

- Focus on Tool → Focus on Systems
- Concern with Usability → Concern with Sociability
- Instructional Design Process → Participatory Design Process

These six foci can be thought of as design tensions that should be weighed up if the focus is to develop web-supported communities. These tensions operate not as opposites but as tensions or dualities with the challenge being to establish an environment that appropriately leverages aspects of each design tension for the specific community at hand. They do not represent clear choices to be made and adhered to in the initial design for community; they are issues to be mindful of throughout the life of the community. As you will see in the cases we present successful communities are flexible and extensible and able to leverage the tensions to build stronger communities.

Communities of Practice

The concept of “community” has a long and rich tradition, and is likely to evoke distinctly different images for each of us. The term has also gained recent popularity as a design focus for projects in varied disciplines from anthropology to computer science. While there are many rationales for its recent allure, in academia and instructional design, much of the current interest was spurred by the work of Lave and Wenger (1991; Wenger, 1998; Wenger, McDermott & Snyder, 2002). Primarily resulting from their anthropological work examining the interrelations of communities and learning, they advanced the term “communities of practice.” In Wenger’s (Wenger, McDermott, & Snyder, 2002, p. 4; Wenger, McDermott and Snyder, 2002, p. 4) work he describes a community of practice as a group of people who share a concern, a set of problems, a passion about a topic, and who interact on an ongoing basis to deepen their knowledge and expertise in this area.

Building on this work and research in fields such as anthropology, education, and sociology, Barab, MaKinster, and Scheckler (2004, p. 55), define a web-supported community of practice as “a persistent, sustained social and technical network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and/or mutual enterprise”. When we enlist the term community of practice we, ideally, are referring to a group of individuals that have: (1) a common practice and/or shared enterprise; (2) opportunities for interactions and participation; (3) mutual interdependence; (4) overlapping histories, practices, and understandings among members; (5) mechanisms for reproduction, and, ideally, (6) respect for diverse perspectives and minority views. Clearly, community is a complex term and one that belies one particular definition or meaning. However, and even with this appreciation, we feel it is necessary for the reader to evaluate the claims being made in this article that they appreciate the characterization of community that we hold.

Wenger (1998) describes the community of practice (CoP) as having three interdependent components; community, domain and practice. For Wenger these three components need to be the focus of explicit attention to ‘create a context for the negotiation of meaning’. Through engagement in all three of these components of the CoP members surface the tacit knowledge of a skilled practitioner and the processes essential to the maintenance and innovation in the practice. The difference between the domain of knowledge and the practice can be seen when John Seely Brown argues that “On one hand a learner takes on the explicit knowledge of the field of physics and on the other the takes on the practices in the field and continually open up the tacit knowledge in the community of physicists” (Brown, 2000, p. 9; Brown & Duguid, 2000, p. 20). In this way, being a core member of a community and being knowledgeably skillful with respect to the

practices and knowledge of the community are inextricably intertwined (Barab & Duffy, 2000).

More generally, the interrelations among meaning, practice, experience, identity, and community are what make community of practice such a powerful design “intervention” for educators. The anthropologist Jean Lave (1993) argued that “developing an identity as a member of a community and becoming knowledgeable skillful are part of the same process, with the former motivating, shaping, and giving meaning to the latter, which it subsumes” (p. 65). This is consistent with the paradigmatic shift that has occurred in the learning sciences, from theories emphasizing individual thinkers and their isolated minds to theories that more fully acknowledge the role of the physical and social context in determining what is known. From this perspective, the community constitutes both content and context, providing implicit and explicit structures some of which are human and others that are reified in material objects, tools, and resources. It is a valuable approach for supporting learning because it aims not simply to support content acquisition but is focused on transforming practices and even identities, and it does this by putting the power of this transformation in the actions of its members.

The evolution of community is truly emergent and cannot simply be prescribed (Baym, 1998 ; Havelock, 2004; Wenger, McDermott, & Snyder, 2002). The challenge becomes how to intentionally design to capitalize on emergence in such socio-technical spaces with learning as the end goal. As we have argued, a community of practice is more than a temporary coming together of individuals. Akin to a living organism, they are self-organizing, continually evolving according to the dynamic constitution of their members and the accepted practices of the community. Barab, Barnett, and Squire (2004, p. 496) stated:

... to speak of communities in a theoretically grounded manner is

to acknowledge that communities emerge through interactions rather than design, and gain their richness, complexity, and opportunities for learning through their multigenerational structures and member pathways for movement through the community. A central design and research challenge is to understand the dynamics that characterize, drive, and maintain community functioning.

There has been a call from several commentators suggesting that it is time to empirically operationalize online communities (Havelock, 2004). Yet it seems we cannot build a road map to community development because community is in itself idiosyncratic and organic by nature. There is a great deal of debate about whether community can be contrived or orchestrated and whether it is only truly effective when naturally occurring. If community development is most effective when occurring as a natural process, how can community managers and facilitators emulate that natural process? Wenger suggests that communities can never be the result of a design only a response to it (Wenger, 1998).

There is clear evidence that designers can establish enabling environments through frameworks, architectures and spaces that invite, promote or facilitate interactivity. However it is the social activity of the members that builds the sense and value of community (Brook & Oliver, 2003; Havelock, 2004). It is not an accident that many of the leading theorists in this field explain community design in terms of gardening metaphors; describing how organisations, managers and coordinators act to cultivate or grow community (Seely Brown & Duguid, 2000; Schlager et al, 2002, Wenger et al 2002). Further, if we plan to design an opportunity for community to grow, we must sustain our attention and care as the gardener continues to

tend garden beds. We cannot front end load the community with a 'good' design process and return at given intervals to evaluate our product. Community design requires a commitment to ongoing and sustained design and management of community as a negotiation process as well as a discrete entity (Fernback, 1999).

One concept that has proven especially effective in understanding and advancing both our theoretical and practical work has been the idea of duality or core tensions. Consistent with the work of Engestrom (1987) and Wenger (1998) tensions are necessary, conflicting, and frequently overlapping, functions that drive a system and that need to be weighed and leveraged—not eliminated. We have come to believe that understanding and exploiting these tensions is a key challenge in intentionally and successfully designing *for* a community of practice.

The Web-supported Community of Practice

It is important to note that while we are talking about communities that leverage technology, we believe that communities intentionally designed to support learning will rarely be successful if entirely online (Schwen & Hara, 2004). Instead, a core assumption underlying our work is that a more successful model is to simultaneously support and leverage both face-to-face and online participation with the goal being to have a *web-supported* community (Barab, Kling, & Gray, 2004). Here we adopt Bruckman and Jensen's (2002) pragmatic definition of success in online communities as being a prolonged level of member activity and engagement. 'If people choose to participate, they likely think that they are benefiting from the experience in some way. If this were not the case, they would not spend their valuable time participating in the online community' (Bruckman & Jensen, 2002, p. 22).

There is a radical difference between what might be conceived as an online or virtual community and one that is Internet-mediated (Stuckey, in press) or web-supported (Barab, Kling, & Gray, 2004). Many unsuccessful attempts at intentional design of community begin with the most difficult set of conditions, working with a wholly distributed group of individuals, not yet known to each other but expected to build relationships, identities, collaboration and trust while communicating over unfamiliar technologies. Alternatively, there is significant evidence that the strongest web-supported communities have at their core people who have a shared understanding of the value of being together (Stuckey, in press). This core group might be realized in an advisory board, stakeholder steering committee, the community leaders or sub-community groups depending on the nature of the community. Very often this core group will have the capacity to meet face-to-face.

In a multi-case study, Stuckey (in press) examined twelve successful Internet-mediated communities of practice. All twelve communities established some level of face-to-face engagement, often beginning with a shared experience in the physical world and moving online to enhance and extend the community activity and relationships. The face-to-face activities and events varied from structured meetings and conferences to ad hoc and opportunistic gatherings. For example ACT-KM (<http://www.actkm.com/>), a knowledge management community for Australian public sector worker, began with the vision of its founder Shawn Callahan to bring knowledge management workers together in an informal setting, share war stories and network. The highly successful wine and cheese nights each month lead to people outside the geographic locale seeking to join ACT-KM, and precipitated a move online for the community to broaden its membership and continue the dialogue between meetings. Today, the community still maintains

the informal monthly gatherings and has developed an annual conference managed and presented by a distributed web-supported community now numbering 1500 members (Callahan, 2002, 2004; Stuckey, in press).

In another example, members of CPsquare (<http://www.cpsquare.org>), a globally distributed CoP community with members collaborating almost wholly online, opportunistically found ways to graft community gatherings onto international events and conferences; thereby, extending into members' face-to-face communities (Stuckey & Smith, 2002). A section of the community's online discussion is devoted to events on the horizon that might serve as viable opportunities to meet. People able to attend do gather and continue their community work, initiate projects and carry out deep reflection on the effectiveness of their practice. There is a recognition that not everyone can attend but that these gatherings still serve to strengthen the community as a whole through serving the needs of that small group. These events often serve to network people in their own cities who may have known each other online for some time but have not established a face-to-face relationship. An online component very often accompanies these face-to-face events to bring the online members into the activity or keep them informed.

Regular face-to-face components, whether for small groups or whole of community activity, can serve to create the rhythm for the community and allow people to manage their periods of high and low investment. They help people remain in the community above the constraints of technology, online identity and time. A spike in online activity is not unusual before and after face-to-face events and community managers report these face-to-face gatherings served to re-energize the community and support members moving from the periphery of the community. It would be fair to say that that if you looked closely at any successful online

community you would find that, whether planned, grafted or ad-hoc, members do have face-to-face contact as part of their community life.

Six Tensions of Community Design

In reflecting on our own work and that of our colleagues we have identified six key design/implementation tensions that are endemic to online community design. What follows is a presentation each of these six tensions, drawing on multiple examples adapted from various works related to design for community. In particular, we begin with an explicit description of the tension, describing what we mean and the core challenges. From here, we then illuminate these tensions through specific examples chosen to concretize the tension at the same time disentangling this context in such a way that will be useful to others in their own work.

I. Content Transmission → Engaged Participation

Many educators and designers have treated learning and knowing as if they were self-contained processes that occurred in confines of individual minds. Spurred by the computer metaphor, the mind was likened to a storage device in which the focus of education was on transmitting content to the passive learner—a “coldly” cognitive process. Knowledge was treated as a thing, and knowing was tantamount to possessing that thing. In the early nineties there were a number of researchers who began to advance a different perspective on what it meant to “know” something (Brown, 1992; Brown, Collins, & Duguid, 1989; Greeno, 1989; Lave & Wenger, 1991; Lave, 1993; Suchman, 1987). At the core of this work was the offering of a new metaphor, one that emphasized *participation over acquisition* (Sfard, 1998). When learning as part of a community, the emphasis is on carrying out

the core practices of the community in the context of community-defined goals. One should not take this argument to imply that understanding content is unnecessary, but rather that it is only part of the story. Further, there is much tacit learning that occurs through contextualized participation that does not occur when simply memorizing content.

In terms of instructional design, one needs to consider how to support learners both in accessing and understanding content and in meaningful participation with others. In fact, the focus from a community of practice perspective is how to arrange technical structures to stimulate meaningful participation through which members of the community come to better understand and in time create their own content. In this way, engaged participation as part of the community and becoming knowledgeable skillful with respect to the community are integrally related. This tension is borne out in Wenger's duality of participation and reification as a key to negotiating meaning. Where participation is about acting, interacting and living in the world, reification is about the development (process and product) of artifacts and objects that embody aspects of the practice. As Wenger calls it to give "thingness" to the often implicit qualities of the practice (Wenger, 1998). This tension of content and participation needs to be balanced variously according to the community and at its stage of development.

Situating this argument in a specific example, we turn to the case of teacher education. While it is possible to reflect on one's own practice in isolation, it is a much richer experience to engage in conversations with others about one's own and about each other's practice. Engaging in rich dialogue, around real practice, with other teachers is one of the opportunities of shifting from a content transmission view of teacher development to a community-of-practice approach. At the same time, engaging in collaborative discussions around practice brings

with it a host of challenges. For example, teachers have limited time and while engaging in collaborative discussions with other teachers about the practice of teaching might be desirable in theory, most teachers are struggling with simply finding the time and resources to teach the next class period. Additionally, finding other teachers with similar interests and who understand the particular classroom needs of another teacher also takes time.

In light of these challenges, we undertook with support of the National Science Foundation to develop a web-supported community of in-service and pre-service mathematics and science teachers sharing, improving, and creating inquiry based pedagogical practices (see Barab, Kling, & Gray, 2004, Chapters 1, 3, 5, 11). Founded in previous research and consistent with the community-of-practice pedagogical commitment, the Inquiry Learning Forum was designed around a "visiting the classroom" metaphor, with the belief that teachers need to be full participants in and owners of their virtual space (<http://ilf.crlt.indiana.edu>). The hallmark of this environment is that teachers with a broad range of experience and expertise can come together in a virtual space to observe, discuss, and reflect upon pedagogical theory and practice anchored to actual teaching vignettes. Specifically, the Forum supports teachers in learning about inquiry practices through: (a) participating in discussions with other teachers, scientists, and educators; (b) gathering and sharing inquiry-based lessons plans and resources; (c) examining videos of teachers' classrooms; and (d) developing personalized professional development plans. Through captured and streamed video, teachers can virtually visit actual classrooms where they observe and discuss the challenges of inquiry-based learning. The ILF supports sharing among community members at all stages of skill development, from master teachers to teachers in training.

A core tension for the project is between having teachers use the Forum as a repository and to download a lesson plan as opposed to engaging in rich discussion with other members about the practice. The design challenge has been to make sure that teachers can locate specific information at the same point that there are opportunities for professional development if they choose to go deeper. In this way, every available resource has a discussion board attached through which teachers can leave notes and engage in dialogue on the use of the resource in practice. Additionally, where relevant, there are links to classroom videos, topical discussion groups with other teachers who are interested in thinking about how to use the resource at a deeper level, and other resources that are topically or conceptually related. Resources are linked such that when a teacher engages in learning about a particular topic (e.g., scaffolding, collaborative learning, classroom management, or inquiry more generally) they are connected into a *network of human and technical resources*. In this manner, teachers do not simply learn the dictionary definition of the topic or concept but engage a rich inquiry process.

This has not been without problems, with one teacher commenting in an interview: "I just wish the site developers would tell us what we need to know. They are the ones with the expertise, which is why we are coming here in the first place." While we have many interviews indicating an appreciation for the fact that the site about inquiry does practice what it preaches and for the deep insights they have gained through this process, it is clearly a design tension. For wouldn't it be easier to simply develop a well-organized site that had clear and definitive answers to the questions that teachers have about best practice? It is our theoretical conviction that for many of the difficult questions that teachers need to grapple with around inquiry, definitive answers may not exist. Instead, it is more useful to engage teachers in rich examples, providing

information resources and supporting a collaborative group through which teachers can develop relationships and "contextualized" understandings that will more meaningfully impact their practice. At the same time, we have had to include rich resources, including lesson plans that some teachers can simply download. The challenge has been to situate these resources such that teachers are likely to also participate in the web of activities that will help them gain a richer appreciation for the topic of interest.

The design focus, however, is on facilitating participation as part of a network and that participation includes, but is not limited to, acquiring important resources (tools, instruments, documents, and proformas). The 'grab and run' action of many new members was cited as a cause for frustration for many community managers (Stuckey, in press). The process of moving from resource-based use to dialogue and collaboration seems to take significant time and ongoing exposure to the norms and culture of the community. Indeed the manager of one community quipped, 'It took me three months after I started working here before I first posted. It was like walking blindfolded into an auditorium and being told to yell'.

Looking beyond academic communities, successful management of this tension can be seen in a number of other Web-supported communities like West Point's *Company Command* (Dixon, Allen, Burgess, Kilner & Schweitzer, 2005), the *Australian Flexible Learning Community* (Stuckey, in press). The managers of these communities found that earning a reputation for the quality of their resource offering became a great hook for new members (and sponsors) and set an expectation of value for further engagement in the community. Community managers described a pattern of use where member's first visits to community were to resolve very specific goals or challenges and people sought to locate a specific instrument, information, solution or advice. If their

experience in their first forays into the community were successful, they recognized quality in those resources and got high return for their time investment, they were often motivated to look around and see what else the community has on offer.

For the Australian Flexible Learning Community the currency and quality of the resources, links to information and expertise was vital to new community members. Many new members reported their first activities in the community were to download resources and seek information from experts. This was a pattern that many maintained for the first year of membership. The community manager described going into the field and meeting members whose feedback suggested they found it easy to download resources but daunting to speak out in such public spaces. To move those members beyond resource collection, and support engagement from the periphery, the community manager worked in the 'back-channel' by phone, email and instant messenger to greet new members, raise member contributions, and to broker links between new members mentors, activities and tools.

In the case of CompanyCommand.com many of the highly valued strategic tools and instruments are developed by members and these make up the greatest number of downloads from the community site. The availability and numbers of each tool or instrument allows for just-in-time learning for members preparing for new commands. Pete Kilner, a community leader describes the learning design of the community as based around the relationship of elements in the Con4-P model (Kilner, 2004). This model proposes that ensuring a quality interrelationship of *Content*, *Conversation*, *Connections* and *Context*, with a clarity of *Purpose*, is the basis of cultivating vibrant knowledge sharing environments.

It is important to note that in mature communities, the resources will be the products

of community collaboration rather than just an aggregation of individual member or centrally developed contributions. MirandaNet (Cuthell, 2002), a mature community of educators working in school-based action research, has funded its community operations through just such collaborative efforts. A large number of the resources of the MirandaNet Fellowship are available over the public side of the community Web site. It is accessed by over 1000 visitors a week seeking resources and advice. The most accessed parts of the community site are the member profiles with associated partnerships and the case studies. These case studies are the work of community members, many are the results of research projects the community tendered for as part of its consultancy program. In CompanyCommand.com the results of collaboration can be seen when commanders returning from deployment overseas were supported by the community management to create a hard copy resource of hints, tips and advice for their colleagues about to deploy. Such project activities involve members in professional and highly reflective discourse involving authentic contexts and compelling needs. The artefacts that result serve to surface implicit knowledge and reify practices.

The key to effectively positioning resources in communities of practice is to contextualize them with surrounding tools such that they serve as a "gateway" to richer community participation. While resources need to be high quality and of immediate practical value to the community, they should be positioned in such a way as to ensure an effective juxtaposition of dialog and activity for community members (Powazek, 2002). Resources alone will not sustain community nor will they alone serve to transform practice. It is the discourse of the community, and often discourse that surrounds objects, that interrelationship of participation and reification, that builds the greatest opportunity for meaning making in communities.

II. Open Ended → Bounded Participation

With the advent of the Internet and following the success of commercial ventures like E-Bay, Amazon, and AOL there was initially a somewhat naïve optimism that: (a) developing something like online community was as easy as purchasing a server and a good graphic designer, (b) Internet technologies would necessarily create anytime, anywhere learning, and (c) totally open-ended spaces and activities would be sufficient for establishing an online community. The truth is somewhat less clear because boundaries do appear to be very important to communities of practice, and successful online communities are quite challenging to develop. In a successful community of practice, boundaries (whether extended, permeable or distinct) have a part to play in enhancing the membership, engagement commitment and norms of the community. Decisions about community boundaries can be seen as communities focus on the development of such aspects as subgroups, time-based activities, delimited foci and topics, and community norms. Pragmatically we can say that while the technology can support ubiquitous usage, individuals do not actually have such open schedules and while the idea of any place, any time learning is attractive in theory, most busy practitioners appreciate some level of boundedness (Barab, MaKinster, & Scheckler, 2004).

Beyond the obvious boundary decisions of creating an open or passworded community space, deciding and adhering to the focus of the community is paramount. The practice is central to the community and it is important that design and facilitation efforts always honor that focus. For example, boundaries strictly define the purpose, domain and topics for CompanyCommand.com. The community's rigorous attention to its focus of preparing commanders for intense, battle-ready command is integral to its success. The community managers

describe the community as operating as a laser beam powerfully concentrating light on this one area of military interest. This is not a community to talk about the redesign of military uniforms, there are other places for that, this is a place for specific discussion of current command concerns and practices.

In the Inquiry Learning Forum, the initial focus was on supporting online community more generally. In fact, the initial name of the site was the Internet Learning Forum referring to the technical aspects and not those aspects that would be of value to teachers. From here, the name changed to the Inquiry Learning Forum and the splash tagline changed from Building a community of Indiana math and science teachers," was changed to "Supporting student learning and teacher growth through inquiry" (Barab, MaKinster, Moore, Cunningham, and the ILF Design Team, 2001). From a theoretical standpoint, the transition symbolizes an appreciation that online communities are not simply about using technology to develop spaces for participation but about supporting individuals whom have a common purpose. While focusing on student inquiry began the process of establishing a bounded focus, it was found that boundaries still needed to be put more tightly around participation—a problem that would not be solved simply from the adoption of a new tagline.

The final set of solutions to this problem resulted in two new features of the ILF: The ILF Collaboratory and the Inquiry Lab. The ILF Collaboratory as a technical space where groups of individuals, referred to as Inquiry Circles, come together around some specific collective experience and/or curricular interest. An Inquiry Circle is a group of teachers who are part of a class, workshop, or are simply share a similar curricular interest—similar to Gee's (2003) notion of affinity groups. In contrast to the broad notion of inquiry, these groups focused on a particular topic like inquiry and motion or

different types of lessons for addressing a particular standard or outcome. These groups ranged from 7-20 members, included a facilitator, and usually had time-restricted activities. The ILF Collaboratory included a sweet of customizable tools that members could use to manage their group, share resources, create common links, collaboratively build lessons, establish private discussion groups, post announcements, and directly link to other ILF videos and classrooms in the more public parts of the community.

The challenge in developing these spaces was to create seamless links that allowed the Inquiry Circle to have privacy at the same time continually connect them into the larger community. The group's facilitator was responsible for determining if the group was private or public, and each group was responsible at the end of a designated period to posting something back to the broader community—lesson plans, summaries of lessons learned, other resources. The facilitator was also responsible for ensuring that member participation worked toward the larger goals as established by the circle. These bounded groups of 7-20 instead of the larger community of over 4000 were where over 70% of the discussion posts occurred.

The Inquiry Circles included those in which participation was voluntarily and those that were mandatory—i.e., pre-service classes being led by a faculty member. The most successful groups in terms of online participation were those that also had face-to-face relationships in which they occasionally communicated in conjunction with the technical resources (Barab, MaKinster et al., 2001). Many of the inquiry circles involved individuals who already had existing relations but saw the electronic tools and community of the ILF as a space where they could continue collaboration. It is important to clarify that at the same time as advocating for bounded groups of participation, it remains important that they are situated as part of the larger community. For example, MaKinster, Barab, Harwood, and

Anderson (in press) compared the reflections and carried out interviews with members assigned different conditions in which they either reflected on their experiences in a private journal, in a collaborative discussion forum involving other members, or in a public discussion forum in the public ILF Lounge area. The Private Journal group wrote more complete initial reflections, but described the experience as simply an assignment and attached little meaning or value to the exercise. In contrast, members in the Private Discussion Forum posted less quality reflections but several members expressed more perceived value in the experience. However, the members in the more public ILF Lounge Discussion Forum posted even less quality reflections but literally all of these members expressed significant value in the interactions with their peers and with the larger ILF community.

The value of small group or sub-group activity and private spaces is revealed in other case studies of successful Internet-mediated communities of practice (Stuckey & Smith, 2004). Like the ILF, the Australian Flexible Learning Community, Talking Heads and the Government Online International Network (GOL-IN) all discovered the need to develop small private group spaces as part of the community's evolution. In some cases, MirandaNet and GOL-IN, these spaces were part of the project-based nature of the community collaborations. In others, Talking Heads for instance, groups formed to hone in on specific practice like fostering religious tolerance within their community engagement. Activities like conference management, community research, or special interest groups intent on building capacity in certain practices, have all called for spaces where the conversations were more freely flowing but less divergent than in the main community forums. The trick was to ensure that the boundaries are somewhat permeable. These groups need to remain part of the larger

community, reporting out at regular intervals and not becoming silos or closeted communities.

Another structure that frequently overlapped with ILF Inquiry Circles, began as part of the Inquiry Laboratory but then extended to self-created expectation cycles. In particular, “inquiry modules” were initially established where there was a clear trajectory and a beginning and an end to one’s participation. One example of this trajectory could be seen in a group defining a course credit or a professional development unit in terms of completing a pre-determined set of activities. At times engagement involved completing a number of posts, or reflections after the viewing of a virtual classroom, or facilitating a particular discussion, or even uploading particular resources into the online library. The important point in the above examples is that while there did exist a larger community structure, the designers worked to support bounded pockets of participation that, different to the larger community, had a clear beginning and end. These were more than just academic course offerings as members could participate in the larger community with aspects of their bounded group participation feeding out to and drawing from the larger ILF community. Such bounded groups might be seen in other communities as special interest groups and project teams.

Bounded activities have proven an integral part of the creation of the rhythm of communities (Stuckey, in press; Wenger, McDermott & Snyder, 2002). For instance in the Australian Flexible Learning Community a monthly newsletter would announce a series of events for that month. In these activities was an *Expert Spruik*, an invited thought leader who would lead a discussion on a cutting edge topic. The discussion would remain open for the first two weeks of the month and a summary of the dialogue posted to the community by mid-month. Also, in that month would be a fun poll or competition, related to a flexible learning theme

or for fun to a topical issue or technology. These time-based regular events and activities, including the newsletter itself, served to draw members back into the community as the spike on page hits would attest. Often a time-based activity, like a book club discussion or a guest speaker visit intensifies the visible activity and may revive a flagging community. Members are often drawn to an event, volunteering as leaders and participants, if they know how long they are required to engage and can come prepared for an intense burst of activity.

A community of practice should expect to offer different levels of activity at different times. Activities bounded by the level of commitment or engagement they call for can be very valuable for community building. For example, in the Company Command community a very well positioned but seemingly simple scenario tool, called the *Command Challenge*, allowed members to quickly engage with a topic and reflect on how they and others may have handled a key situation. Response to the scenario itself involved rating a selection of options on a short form with pull down menus, but the conversation that ensued in the linked discussion was highly reflective and powerful. The low level of commitment in completing the task was an enticement into dialogue on an important topical issue and the way the activity is structured allowed members to decide the depth to which they engaged. Similarly in the AFLC, members could engage in low commitment activities through activities like polls and games. These smaller opportunities for engagement allowed members to maintain, or make first steps toward, community engagement through various levels of participation and commitment. Community members were able to choose from a number of activities, large and small, formal or informal, public or private that would suit their current availability and energy levels. It is important therefore that communities offer diversity and levels of engagement that allow members to stay

in touch with community themes and activities without having to continually carve out large chunks of time from their busy schedules. It is interesting to note that a number of community managers have commented that they did not initially invite members to join a 'community of practice' but to simply network with colleagues. This was because joining a community implies a BIG commitment, one that individuals fear they will not be able to sustain and that they will may become lost to the community.

In all of these communities vibrant open-ended discussions were also opened and sustained by members and facilitators. None would suggest that all community activity should be time-based or bounded, but being able to offer the community members "light and shade" and to create their own rhythm for engagement is vital to the long term stability of the community. Members will wax and wane in their attention to the community, sometimes collaborating at the centre and at other times reading and watching from the periphery, and it is only fitting that design for community activity allow for this.

III. Pre-Defined Structure → Emergent Structure

Aspects of this tension can best be described by telling the stories of two very successful and long-lived Internet-mediated communities of practice. Each was in part successful because of the choices made in terms of the structure of the community. In the first story of *Webheads in Action* the emergent and totally fluid nature of the community design, activity and roles prove integral to its value and success. *Webheads in Action*, a community of TESOL teachers, is arguably one of the most organically structured and, from the perspective of its members, most successful communities of practice online today. (<http://www.homestead.com/prosites-vstevens/files/efi/papers/eltoc2001/webheads00.htm>) *Webheads in action* began in 1997 when the

founder Vance Stevens, having taken a position that no longer saw him teacher for a living, started an online group in the 3-D environment of *The Palace* called English for Webheads. The meetings were where classes of students learning English and teachers would get together. At that time they did, as they do to this day, explore a lot of cutting edge technology and activities together in their quest to learn the English language. They ventured into role plays in the avatar-based *Palace* chat space and developed media files and *Hear Me* experimenting with voice. The meetings were informal and unstructured and moved in and out of technologies to suit the mood and interest of the group assembled. By the year 2000, the group had begun to attract more teachers to community to experiment with online technologies and language teaching, a trend that continues to the present time. *Webheads in Action*, the teacher community, was formed in 2002 and is now a vibrant and active community of practice.

The community has met every Sunday since the summer of 2000, some 400 meetings in total. What to the uninitiated is a disorganized process, can actually be thought of as a process that one community member described as "chaos navigation" and revised in recognition of its effectiveness for this particular context to be "intuitive chaos navigation" (Stuckey, in press). The gatherings last for some three-or-four hours, and are like an open house for a group of very close friends. The community founder, Vance Stevens, describes it as a neighborhood meeting place, and such it is open and rowdy with the hospitality and housework shared amongst all the community members present. A typical meeting might start in Tapped In (described later in this chapter) where the community has an office, or Yahoogroups instant messenger or the Learning Times room the community is sponsored with. Somehow people manage to come and go, finding each other across all these technologies during the time. There is no set agenda and yet

they never end up without one, having decided it most often on the fly.

The community has a recorded history of its chats, meetings and accomplishments for all these six years of activity, over a website that spider webs its way out to many different contributing member sites. There are no formal roles or titles and yet someone always steps up to record the meetings, take notes and do any follow-up that might be required. Community 'elders' have been invited to keynote at TESOL and technology conferences, and the group itself manages an annual online event for the domain. In 2005, the community hosted a highly successful online conference called Webheads in Action Online Convergence, Bridges across Cyberspace. The three day online conference saw keynote speakers and Webheads positioned about the globe present to an audience of 300+ people using podcasts, VOIP, munes and other synchronous technology. All this was managed by a distributed team of volunteer members. It is a tribute to the community that they have sponsorship relations with some very visionary technology developers, who know that putting tools in the hands of this community will gain them immeasurable usability and credibility.

There is a palpable sense of community for a visitor joining a Webheads in Action community meeting, for this is one group that certainly demonstrates it can tend to the periphery as well as the core of their group. Members serve the community with genuine offers of support, coaching, partnership and peer review, and they have established a high level of interdependence and reciprocity. The group does not just talk about issues, while that is part of their purpose, the members explore and experiment with cutting edge technologies and pedagogies in an environment that is safe and supportive. The group is truly self-sustaining and shows very steady growth patterns to its current membership of 400 with few members ever leaving the community. This amorphous group has found a

way of cultivating community that really works to build capacity for its membership.

The second story, and in stark contrast to the unstructured design of the Webheads community, but equally outstanding in its success, the MirandaNet Fellowship community (<http://www.mirandanet.ac.uk>) is built solidly on a tried and tested structure and clear community progression. The *MirandaNet Fellowship's* (Cuthell, 2002) evolution began after the closure of the Toshiba sponsored London Computing Centre. The team of academics involved wanted a way to stay working and learning together about instructional communication technologies, and MirandaNet was born under the vision of its founder Christina Preston. The MirandaNet Fellowship has been operating for twelve years, bringing educators together to carry out action research in schools. The domain of this community is innovative practice in the use of instructional communication technologies in education. To this end, MirandaNet does more than draw people together in conversation spaces; the community supports people working together in collaborative action research projects to build capacity in the profession.

MirandaNet is a community of educators (teachers, academics, consultants and bureaucrats) working together to carry out high-quality, school-based action research. People apply to join the community and, if accepted, enter as members. When a member takes on a personal action research program they are promoted to Scholar status. They work on that research project under the guidance of the senior community member known as a Fellow. Upon the completion and acceptance of their research project, and publication on the community Web site, they themselves become Fellows. Fellows are the inner circle of the community, and the people drawn upon to work in consultancy, mentoring and leadership roles within the community.

MirandaNet's purpose is best expressed in the community's mission statement. 'MirandaNet strives to enrich the lifelong learning of professionals involved in education. Using advanced technologies the Fellowship spans social, vocational, cultural and political divide to create lifelong learning solutions for the education marketplace' The community norms express a clear view of teachers as professionals and the members work to position classroom teachers in roles as action researchers, accorded a certain professional status. The community director described the community activity as being "working groups of people moving forward together" (Preston, 2003).

An ongoing stream of research, assessment, and demonstration projects over the last twelve years has provided a rich learning environment in this community. The Fellowship's work is largely funded through these tendered and sponsored action research projects, and industry partnerships. The community activity is clearly situated in authentic contexts for the integration of information communication technologies. This situativity and the community's adherence to quality research make MirandaNet's research capability of compelling interest to teacher researchers, academics and technology vendors alike.

Partnerships are a key in the MirandaNet Fellowship. Some partnerships evolve through the prescribed structure of the community and the attendant roles. Members, as they progress to Fellow, are able to operate in collaborative groups as mentors, peer reviewers, buddies, team members and leaders. Partnerships also exist at senior and executive levels with the educational institutions, government agencies and vendor groups. These partnerships are actualized in the community dialogue, research projects, the Advisory Board membership and funding opportunities. A large part of the attraction for these highly respected senior partners, at least in the early days, was the credibility and high regard

in which the community founder was held in this domain. She had been a very successful developer and researcher and had established relationships with many of these organizations in past collaborations. Twelve years later the attraction is the high regard in which the total community is held. This respect is in part for the caliber of its membership, but also for the community's reputation to consistently produce high quality research and professional development.

MirandaNet operates on one level as a research consultancy providing advice to education, industry and government. It does this by carrying out research, not rooted solely in academe but, through partnerships with classroom teachers in schools with teachers as research partners. "What MirandaNet does is to provide an innovative and inclusive forum for the agents of change. This is achieved through peer mentoring and action research strategies" (Cuthell, 2001 p.3). This recognition of classroom teacher expertise and teachers as researcher partners is critical to the community that is the MirandaNet Fellowship.

The MirandaNet Fellowship, by virtue of its structure and norms, develops strong ties and interdependency between the members, clients and partners. This is a small selective and clearly bounded community of 200-300 members. The two tiered framework of Scholars and Fellows creates mentoring and leadership relationships amongst peers. The research project partnerships, between people in different educational contexts, create strong bonds between members as they come to rely on and relate to each other when working together. Members build individual and group knowledge and capacity through their relationship with each other.

What these two examples demonstrate is that community instigators need to know their prospective membership and the practices at hand, and to have a clear vision for what community can look like in that context. These

communities are about the same size and both involve teachers working to improve their respective teaching practices and yet they could not be more different in the design and structure. It is no accident that both of these communities were founded by a well respected, passionate and visionary leader. In both cases the founder was close to the work practices of the prospective membership and could envision ways of being together that would develop and inspire members. The community takes time to honor member achievements and to celebrate the community work and success. Both communities hold open flexible time in the schedule for social activity and celebration, indeed being highly social and professional is a hallmark of both groups.

Not every community will relish the “chaos navigation” of Webheads nor thrive moving through the rites of passage of Miranda Net, but all communities need to view design as an ongoing process built upon closeness to and genuine and effective feedback from the members. Design actually begins with those first ‘what if’ conversations with stakeholders, it begins in listening to their needs and keeping close to the practices they care about. Like the investment in a design ethnography that instigated design for the Quest Atlantis community (described later in the chapter), community designers need to invest in finding out what communities, relationships and modes of communication already exist, how people currently share knowledge, and what technological affordances they could see themselves leveraging online (Agre, 1998). Many community designers make the mistake, like a child’s oversized pair of shoes. Of thinking the community will grow into the architecture they have designed. This is rarely the case and as Wenger (Wenger, 2003) suggests a community design heuristic should aim to “design a little and practice a lot”. What this means is that we should design enough to enable social interaction and the first steps in collaboration and put energies into

building the social capital, all the while on the alert for new design opportunities in architecture and infrastructure that the community itself may call for. For designers this means having enough technology and infrastructure in place to look like there is value, while being flexible and extensible so that the community can build ownership. Knowing if and where to place or remove boundaries is clearly part of any effective design process.

IV. Focus on Tool → Focus on Systems

The fourth identified tension had to do with the focus of design. It is very easy to get caught up in the actual technology, assuming that one is developing a technology. In contrast, we have come to appreciate that when designing something like community, one is working to facilitate a system of which the technology is one aspect. Kling, McKim, and Fortuna, and King (2001) and Kling and Courtright (2003) used the term socio-technical interaction network to capture the interactions that the technology was designed to facilitate, with technology simply being a node of the larger network. According to Kling et al. (2001), a STIN includes people (including organizations), data, equipment, documents and messages, legal arrangements and enforcement mechanisms, and resource flows. From an interaction network perspective, any characterization of the technology (e.g., an online community) must capture the networks of interactions among people that both define and are defined by the technology. A community of practice must take into account and relate to the systems of the larger community from which it draws.

Reflecting on a project designed to facilitate the growth of a web-supported community, we gain insight into what this switch in focus means. In this other project, known as Quest Atlantis, we developed a multi-user virtual environment to engage children 9-12 in inquiry-

based learning (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2004). Quest Atlantis (QA) uses a 3D multi-user environment to immerse children, ages 9-12, in educational tasks. Building on strategies from online role-playing games, QA combines strategies used in the commercial gaming environment with lessons from educational research on learning and motivation (<http://questatlantis.org>). Quest Atlantis members are able to travel to virtual places to perform educational activities (known as Quests), talk with other members and mentors, and build virtual personae. A Quest is an engaging curricular task designed to be entertaining yet educational.

Completing Quests requires that members participate in real-world, socially and academically meaningful activities, such as conducting environmental studies, researching other cultures, calculating frequency distributions, analyzing newspaper articles, interviewing community members, and developing action plans.

Drawing on an appreciation of the tensions discussed here, Quest Atlantis while leveraging a 3D engine to establish a game-like environment, might be thought of a collective network of participation (a STIN), with the multi-user virtual environment simply being one aspect of community participation. In fact, no member can join Quest Atlantis except as part of a regular, face-to-face classroom or after-school setting. We spent much time first in classrooms understanding the systems both *within* which this tool would be used and the systems that this tool might *establish*. While these two aspects of system as related to technology as tool (the system in which it will function and the system that it establish) are not mutually exclusive, we feel that for the sake of discussion will be useful to parse.

The first systems we needed to understand were the schools and after-school centers themselves. We spent 18 months simply

collecting data about the types of activities that children did and the types of activities that were and could be brought into schools and after-school activities. Elsewhere, we discussed the methods we used as part of our design ethnography process (Barab, Thomas, Dodge, & Squire, 2004). As we started forward on our design work we realized that we weren't going to simply implement our designed tool into static contexts. During the implementation process we gained an appreciation for the challenges and mutual customization that occurred during the implementation process. Rather than view our designs as separate, we found it much more useful to understand our design work as becoming a part of these larger systems. We began to see our work as primarily creating potentials to facilitate rich interactions with the final design being less of a thing and more as a possibility whose identity would be distributed across its component parts and the systems in which they would or would not become a part.

Quest Atlantis is both a system of participation and is continually integrated into existing systems. Its success lies in its potential to succeed in both these forms. Beginning with its identity as a system, Quest Atlantis is much more than a technology. It includes: 1) a 3-D multi-user virtual environment, 2) inquiry learning Quests and unit plans, 3) a storyline, presented through an introductory video as well as a novella and comic book, involving a mythical Council and a set of social commitments, 4) a globally-distributed community of participants, and 5) a community of youth and adults who associate themselves with the community. The technology is only one aspect of the larger brand context, QA as system, through which the design bears meaning and potential. In terms of its being integrated effectively into existing systems, we could never have even got teachers to use the technology if we did not link participation to standards—the current primary accountability structure of schools. Also, while an effective

inquiry task does not easily lend itself to 45-minute instructional blocks, we had to develop activities that could be successfully completed in this time period and then used “missions,” “investigations,” and “units” as umbrella structures through which to group and give meaning to individual tasks. These are but a few of the local constraints within which we had to ensure that working with our system can operate.

This design work is intended to support learning and participation that extends beyond the technological space. More generally, we do not believe that one can simply design a community, but rather that one designs for a community—establishing a system, not producing a tool. Conceptualizing web-supported communities as interaction systems, we first try to understand the larger functioning that we intend to support and then at which points our technologies can be of most aid. In this way, the technology is not a word into itself but a piece of a larger world in which the learning will be useful. On the other hand, we are designing “something” and this something is intended to facilitate the emergence of at the same time becoming a community of practice. For this reason, we also critically examine and have high expectations for the technologies we develop. By conceptualizing the “design” as a system, and not simply thinking of the system as the context in which it will be used, we begin to think more expansively about the potential designed product. The trick is to both develop a tool that can serve as a tool that is integrated in other systems at the same time designing a space that is a system of its own.

This is not so suggest that every community has to build its own tools. It is true that many thriving communities of practice are hosted over simple third-party, listserv-based technologies like Yahoogroups. ACT-KM (<http://groups.yahoo.com/group/act-km/>), Online Facilitation (<http://www.yahoogroups.com/list/onlinefacilitation/>) and Communities of Practice

(<http://groups.yahoo.com/group/com-prac/>) for instance are highly distributed communities that have all flourished in this currently free user-friendly environment. This environment suits many busy community members as it allows for push of dialog messages in email, while archiving as threaded discussions, allowing a small document repository to be built and for other synchronous chat and VOIP tools offered by Yahoo to be harnessed if and when the community needs them. Other communities of practice like MirandaNet, Talking Heads and The Australian Flexible Learning Community and CompanyCommand.com chose to partner with technology vendors to design and develop purpose-built architectures and tools to tailor to the needs and purpose of the community. CPsquare's community discourse is effectively carried out over WebCrossing a relatively inexpensive tool, designed by the vendors and supported by a user community, heavily customized specifically for this community. Cabweb (<http://www.cabweb.net/portal/index.php>), a community of higher education professional is successfully experimenting with an adaptation of Moodle, an opensource learning management system (LMS). The thing all these communities have in common is that they are attune to the needs of the members; their selection of tools is informed by the systems their members operate within.

V. Concern with Usability → Concern with Sociability

When a community is mediated online the infrastructure requires inclusion of some form of technological architecture. Research has shown that, to the detriment of social development, the technological architecture can assume a precedence for many intentionally developed online groups (Barab, Barnett, & Squire, 2002; Baym, 1998; Klecka, Clift, & Thomas, 2002; Stuckey, Lockyer & Hedberg,

2001). Shirky (1995, p.91) put the technological and sociological aspects of community into perspective when he reduced the online architecture to simple physics: "... the basics of electronic space can be broken into two parts: group dynamics and simple physics. The simple physics is the movement in electronic space and is governed by software and tools. The group dynamics is social interaction governed by human behaviour"

The literature is dotted with evidence that a design that focuses overly on the technological aspects, attempting to build the community out from the tools rather than harnessing technology to community needs, is often doomed to failure (Klecka, Clift, & Thomas, 2002; Preece, 2000; Saint-Onge, 2003; Stuckey, Hedberg, & Lockyer, 2001). This does not suggest that the technology has no influence on the activities and style of community discourse that may develop in a space. Preece (2000) reminds us that just as home architecture can influence how we live, online architecture can influence how communities behave. She suggests that community design must attend to both usability and sociability. Usability involves interface design, navigation support, archiving, scalability, software and users and may focus on the experience of the individual user. Sociability entails aspects of purpose, interaction, presence, codes of practice, etiquette and facilitation and most often focuses on the experience of the social group.

Even a more technologically rich context like Tapped In (<http://www.tappedin.org>) has had to prioritize the socio aspect in order to have success (Schlager & Fusco, 2004). Tapped In began in the USA in 1997 under National Science Foundation (NSF) grant funding. The community has throughout its life utilized synchronous communication tools which in the early days the community ran over a purpose-built MOO (Schlager, Fusco & Schank, 1999), and an infrastructure that enables members to create a personal space, profile, network while exploring

community collaborations and leadership. The vision was that of a shared 'virtual place' (Schlager & Schank, 1997) with an infrastructure designed as a conference centre within which professional dialogue would take place. It is variously described in the literature as a community, an 'online workplace' (Arnheim, 1998), a 'Teacher Professional Development Institute' (Craig & Turner, 2003) and a 'crossroad' (Riel & Polin, 2004). None of these descriptors adequately describe the professional, respectful and supportive atmosphere that the community projects, and the amount of time that the team has targeted to social supports over continuing technological developments.

The project has worked to better understand local social networks, and prioritize technological developments that support and expand these existing relationships. Rather than focusing simply on human-computer interactions, interdependency is prioritized as members, operating with appropriate internal scaffolding and support, take on various roles and projects within the community context. It is in supporting member interaction and not downloadable acquisitions that is the focus of this community. Multiple volunteer roles within the community, and the ability to move in and out of these roles, allow members to establish credibility and identity. At its core, the project prioritizes human relations, building technology around and in the service of these social interactions, with an emphasis on prioritizing communication and collaboration.

The ILF (discussed above) and Tapped In communities designed and developed their environments in-house, using fairly large financial investments and time from a group of designers. However, many of the other community spaces discussed here have thrived on substantially less technological developments. The point to take away from the diversity of toolsets and designs is that community does not need to be constrained by modest budgets and

short deadlines to start-up. And this availability of tools is about to make the possibilities for community even simpler while moving control away from the center. Web2.0 social software will allow individuals to build and find community for themselves. The emphasis on community design, from our perspective, should be less on sophisticated technological developments that allow individuals to interact with the technology (human-computer interactions) and more on how to use the technology to support individuals in connecting with other members (human-human as mediated by computer interactions).

Most recent community of practice and knowledge management (KM) literature recognizes that effective knowledge sharing as more than a 'catch and release' program. It builds on a socially situated view of knowledge as central to any truly effective knowledge sharing practices (Wenger, McDermott & Snyder, 2002; Pollard, n.d). The principles for effective knowledge sharing practices are embodied in a series of shifts that acknowledge the social nature of learning and capitalise on the growth of intuitive and readily appropriated social software. These shifts are illuminated in Table 1.

[insert Table 1 about here]

Today, one does not need to know the answer to every problem but to know **where** to find a solution. Today, when the problem is complex and the volumes of information overwhelming, that 'where' is more likely to be found in social contexts than terabytes of data.

Expertise location is a big issue in companies today. The goal is not only to provide access to information, but to provide access to people that have the information... I don't want raw data, I don't want information, I want the judgements of people I can trust (Boone, 2001 p. 22)

Currently available social software allows individuals to link to each other and to see representations of each others interests, knowledge and social networks. Use of these tools allows individuals and their networks to operate as instruments of reputation building, knowledge sharing and quality control. This is an 'architecture of participation' where the value of the tools grows as more people use them; much as the now ill-fated Napster provided value through the users of the service. More recently, Wikipedia has rapidly grown to be an accepted and arguably authoritative source with vastly distributed authorship. The wide adoption of such tools and application of collective acts as a quality control on the voracity of the knowledge shared through their use (O'Reilly, 2005; McAndrew, Clow, Taylor & Aczel, 2004). More and more we see communities of practice adopting social software like blogs, wikis, podcasting, and tagging tools to network and make meaning. It will be interesting to see how these socially-oriented tools change our notions of community in the next few years.

Even within the current Web1.0 tools and architectures, sociability and collegiality have proven vital in establishing effective professional learning communities. An embodiment of collegiality can be seen in *Webheads in Action* (Stevens, 2005), MirandaNet social events, or the Tapped In community (Schlager, Fusco, & Schank, 2002). The Webheads community relationships are described by its community founder as, "Active WIA participants bring evidence of strong bonds of online collegiality and loyalty, while questioning and reflecting critically upon our experiments, tinkering with free communication tools and environments." MirandaNet has hosted a number of social events, not least of which is its ten-year birthday party. The community founder describes this attention to the sociability as an important part of honoring and celebrating the work of members. Sociability has been a high priority in the Tapped In as

designers from the first conceptions held sociability, facilitation and networking as a cultural goal. This is evidenced by the first greetings from a volunteer on duty to the generous offers of support and guidance by regular members.

While collegiality is attainable over online technology there are also strong caveats in the literature to a picture of ready and productive collegiality. Managers and facilitators of online community-based professional development courses report that teachers often proved either reticent to communicate or unwilling to critique each others' work (Riel & Polin, 2004). Some, like Schlager and Fusco (2004), believe the culture of collegiality must be acquired locally first if more than early adopters are to benefit from collegially-based online activity. Others have reported that teacher engagement, in such online environments, has been a struggle to cultivate and sustain (Barab, Makinster, Moore, & Cunningham, 2001). Many long-lived Internet-mediated communities and networks report various patterns of engagement waxing and waning over time. The long term sustainability of such activities depends on the critical mass of interaction (Preece, 2001), effective facilitation and moderation (Ferry & Kiggins, 1999; Salmon, 2000) and a clear purpose and value perceived by participants (Wenger, McDermott, & Snyder, 2002).

VI. Instructional Design Process <---> Value-sensitive Design Process

Instructional design in information systems can be described as a content-independent process used to interpret learning theory and develop instructional systems (Reigeluth, 1999; Wilson, 1997). The most well known, the traditional ID process (Main 1993: 38-39), describes a series of steps in a design cycle. The cyclic process in this model is known by the acronym of ADDIE for the steps, analysis,

define, design, implement and evaluate. There are many other instructional design models that have also advocated different processes for design (CTGV, 1993; Reigeluth, 1999; Young, 1993). Regardless of the steps that one project decides as relevant for their particular project, we advocate that one also must consider the ethical (value-sensitive) principles underlying the design—especially when designing something like community.

Value-sensitive design is a construct that builds on the democratic principles of participatory design but goes further to bring ethics, agency and values into the equation.

Value-Sensitive Design is primarily concerned with values that center on human well being, human dignity, justice, welfare, and human rights. Specific values include trust, accountability, freedom from bias, access, autonomy, privacy, and consent. Value-Sensitive Design connects the people who design systems and interfaces with the people who think about and understand the values of the stakeholders who are affected by the systems (Friedman, 1999).

Design for community often requires designers to marry or at least integrate these two visions for learning design. Whereas instructional design focuses on delivery and a more discrete staged processes, value-sensitive design focuses on the development of the more intangible aspects of relationships, trust and agency for all stakeholders. Where instructional design might focus on building knowledge, value-sensitive design focuses on ethics, culture and on building safe, enabling and empowering environments. Elsewhere we have discussed design tensions and the reader is most likely familiar with particular design models, so here we will focus here on describing value-sensitive design, and the implications for web-supported communities of practice.

A community based on value-sensitive design involves an infrastructure and process where communities do more than take root; they build ownership and establish a safe harbor for learning. Such environments will support the community in collaborative activities promoting formation of identity, relationships and networks. The community infrastructure supports developing, modeling and sustaining community norms. This is about establishing an ethos that pervades all aspects of community life, and in a mature community, is apparent to members from their first entry into the community space. Accessible and active community facilitators have a big role to play in establishing this ethos. (Babinski, Jones, & DeWert, 2001; Brook & Oliver, 2003; Chapman, Ramondt L., & Smiley, 2005; Marx, Blumenfeld, Krajcik, & Soloway, 1998). Facilitators who may be community managers but are often different from community leaders (Wenger, McDermott, & Snyder, 2002), serve as the first point of human contact in community. The ways in which they work to model the tone and etiquette of the community cannot be underestimated. Effective facilitators spend a great deal of time in one-to-one relationships in these many-to-many environments, working with members to support psychological safety.

One example of this tone setting is the Tapped In community context discussed earlier. The first experience of Tapped In is not a clinical helpdesk transaction but a lively and welcoming invitation into the space that hints at the culture that resides inside. People are moved and given confidence to emulate the tone, values and implicit norms modeled by these volunteer leaders. The tone set for the community in this first engagement flows through most community experiences as members recognize novices, freely volunteer advice, and provide support and coaching. It is easy to develop close ties in such an environment and a basis for trust and confidence. Several other communities of those

we have encountered embody value-sensitive design. Webheads, MirandaNet and CompanyCommand have variously designed for values development. In Webheads it is the culture of collaboration and unconditional support that pervades the community activity. In MirandaNet, it is professionalism and high teacher morale that are a constant and its sister community World E-Citizens carries high ideals and moral purpose for world citizenry. CompanyCommand builds on ethos of the wider military community of integrity and selfless service.

One community that explicitly marries instructional design and value-sensitive design is the Quest Atlantis student community. At its core, Quest Atlantis sits at the intersection of *education*, *entertainment*, and the project *social commitments*. The designers have worked to develop a technology-supported environment that is not a game yet remains engaging, that is not a lesson yet stimulates learning, and that is not evangelical yet nurtures a social agenda. This social agenda is explicitly defined as a priority of the design team:

More generally, our design work is an example of what we refer to as *socially-responsive design*. This type of design work involves building socio-technical structures that are explicitly designed in collaboration with, and towards the continual growth of, individuals and those communities in which they are nested. In our case this type of design work has involved balancing the educational, motivational, and social priorities that underlie our work. (Barab, Thomas et al., 2005, p. 88)

In this work, the social agenda at first was more subtle, but as the work progressed it became an

explicit part of their marketing such that it now plays a core part of the project identity (see <http://questatlantis.org>). In fact, they have organized member identity around participation related to these life commitments such that for each member their performance in relation to these commitments becomes a core part of how their identity is perceived from their project home page (Barab, Arici, & Jackson, 2005).

While not all projects need to explicitly display their identity so centrally, the message we wish to convey is that designing community is a value-sensitive process. While not all would agree that at its core community design has roots in a Marxist, socialist ideology. However, we have argued that community design involves valuing all members and a commitment to ensuring a member-negotiated (not simply a designer-determined) identity. Even if the community agenda might be socially transgressive there remains an element of member empowerment, simply because the designer has chosen to enlist a design type that necessarily encourages local voice. However, value-sensitive design goes one step further, encouraging the designer to integrate ethics, agency and values into the design equation. It serves to create a culture. This means looking beyond how to support content learning, but also to think about the nature of that content, as well as how the learning environment facilitates the development of trust, accountability, freedom from bias, autonomy, and differential access.

Conclusion

The power of the Internet coupled with the learning potential inherent to a community-of-practice model for supporting learning has led to a number of design efforts to develop so-called online communities. Some of these have proven very successful, others partly successful, and still others have failed. While different people have different views of what constitutes community

and what counts as success, no one who has tried to develop a web-supported community in the service of learning could deny the challenges in doing so. Communities are self-organizing structures, continually evolving in ways that cannot be prescribed through some particular design. They grow, evolve, and change dynamically, transcending any particular member and outliving any particular task. To truly acknowledge the complexity of communities or practice in a theoretically grounded manner is to acknowledge that they emerge through interactions rather than design, and gain their richness, complexity, and opportunities for learning through their multi-generational structures and member pathways not pre-determined channels. A central design and research challenge is to understand the dynamics that characterize, drive, and maintain community functioning.

In this chapter, we have highlighted six design tensions that, in our experience, lie at the heart of why “Good Design Isn’t Enough” when designing to support something like community. Further, these tensions are not simply overcome and, we have argued, overcoming these tensions or simply working towards one side of the tension should not be the target. Instead, tensions, as discussed in this chapter, need to be continually checked and reflected upon, providing benchmarked reminders that can serve as checks from which to evaluate one’s design decisions. If the designer goes too far to one of the poles of these designs, unless clearly warranted by member needs, they run the risk of obfuscating the power of web-supported communities. The trick is to remain in dynamic interaction, providing features and interactions that sway back-and-forth among the two sides of the seven tensions. For, tensions give life to systems and without the interplay among these poles the community, and the learning of individual members, will most likely stagnate. For example, if all a community a community

was simply about participation but had not content then it would provide less value to its members (Wenger, 1998); similarly, if the designers simply focused on supporting content transmission than there would be little sense of community and all that that entails. As another example, while we have argued for bounded participation, if it was too bounded we would be slipping back into traditional course structures and lose the potential power of a community model for situative learning.

Clearly, designing for the emergence of a web-supported community is not an easy task. In this chapter we have discussed those particular tensions that we identified in our own work, and have presented them in a manner that we hope will prove valuable to readers as they reflect on their own work. We have described community design as part of the challenge, but have emphasized sociability challenges and how communities are emergent and not simply designed. As such, the lines between design and implementation become blurred, with much of the identity of any particular community taking shape in the unfolding member participation and not initial design specifications. A great deal of the work is carried out by facilitators in the back-channel activity, away from the public gaze of the membership, and involves welcoming, encouraging, building trust, making introductions and linking people, information and activities. In successful web-supported communities, the facilitator is a vehicle for community feedback as their interactions allow them to constantly take the temperature of the community.

We have also emphasized the point that when designing something like community it is practically impossible, and we would argue undesirable, to remain ethically neutral. Communities have agendas and have the potential to accomplish transformative work. If one spends time really trying to understand the systems within (or through) which the technology will transact, she will necessarily become attuned

to problematic issues—they exist in all walks of life. For example, spending time in classrooms helped us simultaneously appreciate the many constraints under which teachers operate at the same time becoming disheartened at the ways in which our current obsession with standardized test scores and breadth over depth has led to impoverished pedagogical practices. Or, as another example, our appreciation for the complexity and power of videogames also led us to feel disheartened at some of the underlying and explicit messages that these games communicate to youth. It is our hope that this chapter will aid our colleagues in actualizing those agendas that they, and the members of the community with whom they are designing, view as significant. More generally, we have emphasized that the building of a community takes a community, and cannot be simply prescribed by even a well-intentioned designer.

References

- Barab, S. A., Arici, A., Jackson, C. (2005). Eat your vegetables and do your homework: A design-based investigation of enjoyment and meaning in learning. *Educational Technology* 65(1), 15-21.
- Barab, S. A., Barnett, M. G., & Squire, K. (2002). Building a community of teachers: Navigating the essential tensions in practice. *The Journal of The Learning Sciences*, 11(4), 489-542.
- Barab, S. A., & Duffy, T. (2000). From practice fields to communities of practice. In D. Jonassen, & S. M. Land. (Eds.). Theoretical Foundations of Learning Environments (pp. 25-56). Mahwah, NJ: Lawrence Erlbaum Associates.
- Barab, S. A., Kling, R., & Gray, J. (2004). (Eds.). *Designing for Virtual Communities in the Service of Learning*. Cambridge, MA: Cambridge University Press.
- Barab, S. A., MaKinster, J., & Scheckler, R. (2003). Designing system dualities: Characterizing a web-supported teacher professional development community. *Information Society* 19(3), 237-256.
- Barab, S. A., Thomas, M, Dodge, Carteaux, R., and Tuzun, H. (2005). Making learning fun: Quest Atlantis, a game without guns. *Educational Technology Research and Development* 53(1), 86-108.
- Barab, S. A., Thomas, M, Dodge, Squire, K., & Newell, M. (2004). Critical design ethnography: Designing for change. *Anthropology & Education Quarterly*, 35(2), 254-268.
- Barab, S., MaKinster, J. G., Moore, J., Cunningham, D., & the ILF Design Team. (2001). Designing and building an online community: The struggle to support sociability in the Inquiry Learning Forum. *Educational Technology Research and Development*, 49(4), 71-96.
- Baym, N. K. (1998). The emergence of on-line community. In S. Jones (Ed.), *Cybersociety 2.0: Revisiting computer-mediated communication and community* (pp. 35 - 68). Thousand Oaks, CA: Sage.
- Berge, Z. L. (1995). Facilitating computer conferencing: Recommendations from the field. *Educational Technology*, 35(1), 22-30.
- Brook, C., & Oliver, R. (2003). Online learning communities: Investigating a design framework. *Australian Journal of Educational Technology (AJET)*, 19(2), 139-160.
- Bruckman, A., & Jensen, C. (2002). The mystery of the death of MediaMOO: Seven years of evolution of an online community In K. A. Renninger & W. Shumar (Eds.), *Building Virtual Communities* (pp. 21-33). Cambridge: Cambridge University Press.
- Callahan SD (2002) Building a public sector CoP. *Knowledge Management* 6, 33-35.
- Callahan SD (2004) Cultivating a Public Sector Knowledge Management Community of Practice. In 'Knowledge Networks: Innovation Through Communities of Practice'. (Eds PM Hildreth and C Kimble). (Idea Group: Hershey PA)
- Chapman, C., Ramondt L., & Smiley, G. (2005). Strong community, deep learning: exploring the link. *Innovations in Educational and Teaching International*, 42(3), 217-230.
- Cuthell, J. (2002). MirandaNet: A Learning Community—A Community of Learners, Actis Limited, Rutland Mills, UK
- Darling-Hammond, L. (2000). Futures of teaching in American education. *Journal of Educational Change*, 1(4), 353 - 373.
- Dixon, N., Allen, N., Burgess, T., Kilner, P., & Schweitzer, S., (2005) CompanyCommand: Unleashing the Power of the Army Profession, Center for the Advancement of Leader Development & Organizational Learning, West Point, NY.
- Fernback, J. (1999). There is a there there. Notes toward a definition of cybercommunity. In

S. Jones (Ed.), *Doing Internet Research. Critical Issues and Methods for Examining the Net* (pp. 203-220). Thousand Oaks, CA: Sage Publications.

Gonzalez, D. (2002). Index of 'Webheads in Action' Web pages and related sites [Electronic Version]. Retrieved 13/03/04 from <http://www.malhatlantica.pt/teresadeca/webheads/wia-index.htm>.

Goodfellow, R. (2003). *Virtual learning communities: Communities of practice and other frameworks for conceptualising, developing and evaluating NCSL's initiatives in linking staff and school communities*: Open University.

Havelock, B. (2004). Online community and professional learning in education: Research-based keys to sustainability. *Association of Computing in Education*, 12(1), 56-84.

Klecka, C. L., Clift, R. T., & Thomas, A. R. S. (2002). Proceed with caution: Introducing electronic conferencing in teacher education. *Critical Issues in Teacher Education*, 9(28-36), 1-18.

Kling, R., McKim, G. W., Fortuna, J., King, A. (2000). *Scientific collaboratories as socio-technical interaction networks: A theoretical approach*. Trier, Germany: Digital Bibliography & Library Project. Available at <http://arxiv.org/pdf/cs.CY/0005007>

Kollock, P. (1996). Design principles for online communities [Electronic Version]. *PC Update*, 15, 58-60. Retrieved 07/07/03 from <http://www.sscnet.ucla.edu/soc/faculty/kollock/papers/design.htm>.

Kollock, P., & Smith, M. (1996). Managing the virtual commons: Cooperation and conflict in computer communities [Electronic Version], 15. Retrieved 20/12/03 from <http://www.sscnet.ucla.edu/soc/faculty/kollock/papers/vcommons.htm>

Lave, J. (1993). Introduction. In J. Lave & S. Chaiklin (Eds.). *Understanding practice: Perspectives on activity and context* (pp. 3-34). New York: Cambridge University Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.

MaKinster, J. G., Barab, S. A., Harwood, W. & Andersen, H. O. (in press). The effect of social context on the reflective practice of pre-service science teachers: Incorporating a web-supported community of teachers. To appear in *Journal of Technology and Teacher Education*.

Marx, R. W., Blumenfeld, P. C., Krajcik, J. S., & Soloway, E. (1998). New technologies for teacher professional development. *Teaching and Teacher Education*, 14(1), 33-52.

McAndrew, P., Clow, D., Taylor, J., & Aczel, J., (2004) *The evolutionary design of a Knowledge Network to support knowledge management and sharing for lifelong learning*, British Journal of Educational Technology Vol 35 No 6 2004, p739-746

O'Reilly, T., (2005) What Is Web 2.0 Design patterns and business models for the next generation of software. Retrieved 21/10/2005 from <http://oreillynet.com/lpt/a/6228>

Pollard, D., (n.d.) Preparing for conversations with Dave Pollard. Weblogs and other social software for knowledge work Retrieved 10/11/2005 from <http://www.kwork.org/Stars/pollard.html>

Powazek, D. M. (2002). *Design for community*. Indianapolis: New Riders.

Preece, J. (2000). *Online communities: Designing usability, supporting sociability*. Chichester: Wiley & Sons.

Preece, J. (2001). Sociability and usability in online communities: determining and measuring success. *Behaviour & Information Technology* 20(5), 347-356.

Riel, M., & Polin, L. (2004). Learning communities: Common ground and critical differences in designing technical support. . In S. A. Barab, R. Kling & J. Gray (Eds.), *Designing for Virtual Communities in the Service of*

Learning. Cambridge, MA: Cambridge University Press.

Reigeluth, C. (1999). (ed). *Instructional-Design Theories and Models: A New Paradigm of Instructional Theory*, Vol. 2 (*Instructional Design Theories & Models*). Mahwah, NJ: Lawrence Erlbaum Associates.

Saint-Onge, H. (2003). Guest speaker presentation given in teleconference discussion: CPsquare, May 3rd 2003..

Schlager, M., & Fusco, J. (2004). Teacher professional development, technology, and communities of practice: Are we putting the cart before the horse? In S. A. Barab, R. Kling & J. H. Gray (Eds.), *Designing Virtual Communities in the Service of Learning* (pp. 120-153). Cambridge: Cambridge University Press.

Schlager, M., Fusco, J. & Schank, P (2002). Evolution of an on-line education community of practice. In K. A. Renninger and W. Shumar (Eds.), *Building virtual communities: Learning and change in cyberspace*. NY: Cambridge University Press, 129-158.

Shirky, C. (1995). *Voices from the Net*. Emeryville, CA: Ziff-Davis Press.

Stevens, V. (2002). Webheads chat logs from September 8, 2002 [Electronic Version]. Retrieved 15/03/04 from <http://www.homestead.com/prosites-vstevens/files/efi/chat2002/wfw020908.htm>.

Stevens, V. (2005). Webheads - Intuitive chaos management in online collaborative interaction [Electronic Version]. *Knowtips Conference* Retrieved 20/04/05 from <http://www.homestead.com/prosites-vstevens/files/efi/papers/horizonlive/2005feb25whjam.htm>.

Stuckey, B., Hedberg, J. G., & Lockyer, L. (2001, September 8-11). *Growing an on-line community of practice: Community development to support in-service teachers in their adoption of innovation*. Paper presented at the The 9th Improving Student Learning using Technology Symposium, Edinburgh, Scotland.

Stuckey, B., Lockyer, L., & Hedberg, J. (2001). *The case for community: On-line and ongoing professional support for communities of practice*. Paper presented at the Education Odyssey 2001: Continuing the journey through adaptation and innovation - 15th Biennial Forum of the Open and Distance Learning Association of Australia, Sydney.

Stuckey, B & Smith, J (2004) Building Sustainable Communities of Practice in Paul M. Hildreth , Chris Kimble (eds) Knowledge Networks: Innovation Through Communities of Practice

Vance, V., & McKinnon, D. H. (2002, 7-10 July). *Teacher professional development online: Fertile ground or fetid swamp?* Paper presented at the Untangling the Web: Establishing Learning Links ASET Conference 2002, Melbourne.

Wenger, E. (1998). Communities of practice: Learning, meaning, and identity. Cambridge, MA: Cambridge University Press.

Williams, R. L., & Cothrel, J. (2000). Four smart ways to run online communities. *Sloan Management Review*, 41(i4), 81-91.

Table 1. Shifts evident in current knowledge sharing practices

From	To
Collecting assets	Connecting people
Technical focus	Social focus
Central content management	Personal content management
Top down strategies	Bottom up viral evolutions
Compliance	Enabling
Web 1.0 tools	Web 2.0 tools