

DISTRIBUTED LEARNING COMMUNITIES:  
AN ALTERNATIVE TO DESIGNED INSTRUCTIONAL SYSTEMS

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In the wake of the constructivist movement in psychology and education, the field of instructional design (ID) is re-examining its relationship to learning and instruction. Many ID theorists are calling for more situated approaches to the design of instruction, encouraging teachers and local groups to take ownership of the design process and adapt their methods and goals to the needs of students and stakeholders (e.g., Duffy & Jonassen, 1992; Hanaffin, 1992; Wilson, Teslow, and Osman-Jouchoux, 1995; Winn, 1993). Others have defended traditional views of instructional design as a prescriptive science or technology, charged with developing universal methods and strategies that will result in effective, efficient instruction (Merrill, Drake, Lacy, & Pratt, 1996).

The issue is further complicated by the growing negative connotation of 'instruction.' To many constructivist educators, what they are trying to accomplish with students cannot be captured by 'instruction.' Instruction is typically thought to have clear, prespecified learning objectives, teacher-determined activities and instructional strategies, and clear boundaries in time and space. What happens when learning occurs, but not in such clearly directed, controlled terms? ID theorists are examining alternate metaphors such as "learning environments" to describe situations where the learner assumes more direction and control over goals, content, and methods (e.g., Wilson, 1996).

The idea of "learning communities" has also been discussed as an alternative metaphor to traditional instruction. Learning communities are groups of people who support each other in their learning agendas. Learning communities are found in classrooms where everyone is in learning mode-including the teacher-and where a sense of cohesion and common purpose is present. Learning communities may also be found in work, home, and play settings.

What happens when groups of people gather together informally to provide mutual support for learning and performance? How would that work? Rather than being controlled by a teacher or an instructional designer, learners might "self-organize" into functioning communities with a general goal of supporting each other in their learning. The functions of guidance and control become distributed among group participants. Specific roles of group members are not assigned but rather emerge from the interaction of the whole.

This paper is our initial effort to outline the concept of a *distributed learning community* as an alternative to teacher-controlled or pre-designed instructional systems. We argue that distributed learning communities constitute an important alternative to centrally designed systems, and that communication technologies can serve to support such learning communities in their efforts. We present below an outline of our current thinking.

## WHAT IS A DISTRIBUTED LEARNING COMMUNITY?

We see distributed learning communities (DLCs) as decentralized learning groups focused and interacting enough to form a stable community. Let us unpack the elements of the term:

*Communities.* Groups become communities when they interact with each other and stay together long enough to form a set of habits and conventions, and when they come to depend upon each other for the accomplishment of certain ends. Communities exist where a local culture takes shape; that is, culture may be seen to reside within communities.

*Learning communities.* In truth, all communities learn. One of the lessons of situated cognition is that learning cannot be separated from action. We are learning every day, in everything we do (Clancey, 1992). We add the qualifying term to our definition to suggest a community sharing a consensual goal to support each other in learning. Everybody expects to learn and is prepared to engage in activities at least partly for that reason. This would distinguish learning communities from those solely concerned with entertainment, political action, or the performance of an immediate task. We would note, however, that groups can have complex agendas, and that a group may have multiple goals shared throughout the membership, such as supporting both work performance and learning.

*Distributed learning communities.* The term 'distributed' is added to distinguish the construct from traditional, centralized groups of learners found in many classrooms. We are using the term to suggest that the work of learning, decisionmaking, agenda-setting, and maintaining group cohesion—each of these responsibilities is distributed to group members and not controlled by an outside authority or manager. Transformative communication is the norm, with both sender and receiver of messages changed by the interaction (Pea, 1994; Ryder, 1995). Thus a classroom wherein the teacher assigns a project, expecting the students to learn something but not expecting to learn herself—such a classroom would not yet be a distributed learning community because all participants are not engaged in the learning experience.

From this description, we would expect DLCs to emerge in schools only rarely, because of the heavy influence of teachers and administrators, and because of their accountability to school boards and the community. DLCs, like weeds, will tend to pop up between the cracks of established learning programs. DLCs will take shape in settings where learning is needed, but where formal instruction, for whatever reason, is not available.

Specific attributes characterizing DLCs are offered in Table 1.

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Distributed learning communities (DLCs) are groups of people who form a learning community generally characterized by the following:

- distributed control;
- commitment to the generation and sharing of new knowledge;
- flexible and negotiated learning activities;
- autonomous community members;
- high levels of dialogue, interaction, and collaboration;
- a shared goal, problem, or project that brings a common focus and incentive to work together.

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We would expect to see the following additional characteristics over time:

#### Positive Outcomes

- capacity to adapt to local conditions and evolve over time;
- creativity and innovation;
- crossing of traditional disciplinary and conceptual boundaries;
- appreciation of diversity, multiple perspectives and epistemic issues;
- community members who are responsible and skilled at diagnosing and addressing their learning needs;

#### Negative Outcomes

- short-term inefficiencies;
  - lack of central control;
  - lack of predictability.
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Table 1. Characteristics of distributed learning communities (DLCs).

DLCs are the sort of open, adaptive system described by Kevin Kelly in his book *Out of Control* (Kelly, 1994). Complex, adaptive systems are defined by "(1) the absence of imposed centralized control; (2) the autonomous nature of subunits; (3) the high connectivity between the subunits, and (4) the webby nonlinear causality of peers influencing peers" (p. 22, reformatted).

According to complexity theorists (Kelly, 1994; see also Gleick, 1987; Hayles, 1991; Prigogine & Stengers, 1984; and Waldrop, 1992), a complex, adaptive system takes on life-like qualities such as intentionality, self-correctability, self-preservation, and even intelligence. Examples of complex systems include the stock market, ecological systems, and living organisms. Similar qualities of intentionality and adaptivity should emerge in a learning community if they have the characteristics noted in Table 1 and further discussed below.

*Distributed control.* In a typical classroom, the teacher is in charge. The teacher makes all the important decisions, such as what to teach and how to teach it. Student become involved to the extent that teachers delegate authority to students. In a DLC, nobody is in official control-or rather, everybody is unofficially! Conventions, shared understandings, rules for settling disputes or for governing communications-All of these are negotiated and agreed upon by the group as a whole. So are learning goals. If one member has a different vision for where the group should be going, this is presented to the group and discussed. The community is bigger than any single member, yet it encompasses the perspectives of all members.

*Commitment to the generation and sharing of new knowledge.* Everybody learns. Nobody stands apart, pulling the strings for the sake of the others. By sharing, listening, watching, and imitating, all members of the learning community benefit. This is consistent with Vygotsky's (1978) emphasis on social support for learning, and the related notion of scaffolding (e.g., Newman, Griffin, & Cole, 1989). Those with greater expertise play critical roles in helping and modeling, yet they are expected to learn, solve problems, find answers, right along with the rest of the group.

*Flexible and negotiated learning activities.* Specific learning goals and activities largely "happen." There is a sort of natural selection of activities-Those that are successful and lead to learning are repeated and developed and shared, while those that are not supported by the group fall into disuse. This can lead to inefficiencies and a meandering process of development, but it can work.

*Autonomous community members.* One of Kelly's key components of complex systems is that of "autonomous agents"; that is, community members must have a certain room to direct their own activities and make decisions. There needs to be room for variation and differences among community members; otherwise the system devolves down to a single controlled perspective.

*High levels of dialogue, interaction, and collaboration.* High levels of connectivity are essential to complex systems and to DLCs in particular. A neighbor may be doing great things, but if that information is not shared via constant communication, then other community members will not be aware of it. Information is what drives the feedback loops that lead to new learning and change in the overall system (Bateson, 1972; Pask, 1975, 1984).

*A common focus and incentive to work together.* DLCs need a reason to exist. This may come from shared interests, or a common goal, problem, or project. Outside constraints, such as market or job demands, may provide an incentive for a group to form. Work groups may be motivated to keep their jobs. The free market of Internet listservs may allow communities to coalesce around very localized interests, such as breeding border collies or following the fortunes of an NFL franchise. Public-school students may converge on a project or major assignment, such as a yearbook or newspaper. Students in Carnegie-type classrooms may be hard-pressed to find a threshold of common purpose sufficient to create a truly distributed learning community. Certainly such a concept competes with the bulk of school conventions and cultural forms.

Consistent with other complex systems, we would expect to see a number of additional features emerge in DLCs, some positive and some negative. These are briefly discussed below.

## POSITIVES

*Capacity to adapt to local conditions and evolve over time.* Because DLCs depend upon each member for information, DLCs should be able to pick up on changes in the environment more quickly than controlled instructional groups. Behavior of DLCs is more fluid and flexible than fixed-goal and fixed-strategy systems, allowing easier adaptation and change over time.

*Creativity and innovation.* DLCs will tend to be more pluralistic than instructional systems because behavior is not centrally controlled. Much variant behavior may prove unfruitful, but amid the diversity, some ideas will show promise. Thus creativity, change, and innovation should be more prevalent than in instructional systems. The DLC may experience more failures, but more innovative successes as well.

*Crossing of traditional disciplinary and conceptual boundaries.* Typically, a DLC cares less about its disciplinary base than the problem it is trying to solve. Workers from a variety of backgrounds, for example, may form a DLC if they face a common challenge or problem. Each person brings the baggage of their prior experience, and each submits to being influenced by the community. The cross-fertilization that results can lead to new categories and new perspectives not previously perceived by established communities.

*Appreciation of diversity, multiple perspectives, and epistemic issues.* Expertise is inherently multi-perspectival in a DLC. Members come to respect knowledge that comes from a variety of sources—people of different backgrounds and information of different types. Likewise, community members develop their own methods for testing proposed knowledge against a variety of standards and codifying that knowledge in a way that can be shared throughout the group and across situations and time. The upshot of this diverse environment is that community members progress in their epistemic understanding, perhaps moving from black-and-white views of knowledge toward more sophisticated views of how we come to know things.

*Community members who are responsible and skilled at diagnosing and addressing their learning needs.* Here is both a benefit and a challenge to DLCs. When control is distributed throughout the group, more demands are placed on individual members. Because teacher is no longer doing the hard work of deciding on goals, methods, and new knowledge, community members must meet the challenge of assuming these roles. Metacognitive knowledge-knowing how to monitor one's learning and how to address ill-defined problems-becomes an essential part of the community, which hopefully can also be shared throughout the group. A systemic analysis may conclude that a given group cannot become a DLC because of deficiencies in this area. On the other hand, a group may progress incrementally in these skills and move steadily toward more self- (or community-) directed learning.

## NEGATIVES

*Short-term inefficiencies.* Just as a Vermont town meeting can be more laborious and inefficient than a professionally managed city's well-defined processes, so DLCs can be more inefficient and indirect than controlled instruction. A well-packaged instructional program may be able to teach a fixed set of rules more efficiently. If such a product were reliably available, then a DLC would be wise to recommend its use. In the absence of such structure, however, DLCs may tend to "muddle through" (cf. Bateson, 1972, pp. 3-8) with its share of redundancies, inefficiencies, lack of focus, and lengthy processes.

In the long term, however, DLCs may be an efficient route toward learning. A cow does not look for the shortest route up a hill, but rather keeps its head down, walking steadily without noticeable climbing. The result is the most efficient use of its energy (Allen, 1996). In like manner, DLCs will tend to meander. But the shortest path may not always be the wisest path, and at times a meandering path may be the most efficient use of resources.

*Lack of central control.* DLC's decentralized control can be a handicap. The leadership and vision of a charismatic leader can marshal community resources and stimulate purposive action. At times, the unwieldy, amorphous character of DLCs can frustrate those who expect well-defined, focused direction in the learning process.

*Lack of predictability.* DLCs can frustrate the intentions of the best designers. A constant among initiators of DLCs is the reported surprise at the direction the group takes. DLCs seem to have a mind of their own, and where they end up is not where they start. This is true of distance-learning groups, collaborative workgroups, and learning communities within classrooms. Often the surprises are pleasant, but the evolving nature of the group can be difficult for people trying to plan for the future.

In one sense, DLCs can be thought of as being learner-centered. Community members must take more responsibility for their own learning than in most designed instructional systems. In another sense, however, the "centeredness" is found in the community rather than the individual learner. Ideally, community members lacking metacognitive skills may participate and receive support from the group. The group often dictates the learning agenda-or at least engages individuals in dialogue concerning that agenda. The thought of individuals isolated, setting individual goals, pursuing those learning goals individually-This is contrary to our conception of a

distributed learning community. So we tend to think of DLCs not simply as tools for self-directed learning, but as supportive communities wherein a variety of learning goals may be pursued, some individual and some shared throughout the membership.

### THREE SCENARIOS

To this point we have outlined a concept, but critics may question whether DLCs can be found out there in the world. Are the defining characteristics too demanding? Would distributed leadership be too impractical to sustain over time? Would centrifugal forces break up fledgling groups? These are legitimate questions that deserve further attention. Our workgroup at the University of Colorado has reported some work in this area (Sherry & The University of Colorado Internet Task Force, 1996; Sherry & Myers, 1996; Sherry, Myers, & The Internet Task Force, 1996). We are presently engaged in two more empirical studies aimed at identifying processes used by DLCs and describing their functioning in more detail (Ryder & Wilson, 1997; Morse, 1997). Below we present three settings we have observed, where distributed learning communities (or DLCs) are beginning to take root.

*Workplace learning.* Martin works with a group of engineers charged with developing new products and specifications for supporting those new products. Martin finds himself working on products whose standards have not yet been finalized, which in any case will be replaced within 18 months by another standard or a newer, more capable product. When a standard doesn't exist, where does an engineer go to get answers? Off-the-shelf training is no help except for generic skills. Customized training products such as computer-based training take too long to develop and would not be cost-effective for the engineers' specialized needs. Hiring a consultant/trainer to come from the university and give lectures is a possibility, but often the expertise is not available, and when it is, the cost of pulling people away from their work in a high-pressure environment can be enormous. Even performance support systems—electronic or otherwise—exact a toll in time and effort. These systems must be designed, and therein lies the problem: nobody knows enough to design them, and if they did, they would be too busy putting out immediate fires to take the time. In short, expertise is scarce and doesn't exist in any form specifically designed for instruction or support.

As an alternative to traditional training and performance-support solutions, Martin has been promoting the concept of shared problem solving and archiving of solutions. When an engineer needs to know something, she asks for help among the workgroup. If someone has an answer, the solution is shared publicly and archived for future reference. Getting engineers to think in terms of mutual, collaborative support is a challenge, but given the pace of change and the demands for expertise, they really have no choice. They must learn to cultivate and share expertise, or they will not survive in their competitive environment.

*Academic culture.* What is an academic program in higher education? Is a masters program the sum of courses required of students for the degree, or is it something more? How does an academic unit's local culture serve to encourage learning—within classes, on collaborative projects, or among individual students and faculty? Brent has been reflecting on ways that students, faculty, staff, friends, and alumni all work together to foster learning and professional growth. The communications

infrastructure provided by e-mail and the World-Wide Web can serve to facilitate higher levels of connectivity and participation and new learning.

In the case of higher education, faculty members benefit as much as students from the interaction and sharing of expertise. Because faculty members do not typically return to school for more degrees, they rely on professional interactions-including stimulus from students-as a key resource for new learning.

For the last couple of years, our research team has been exploring ways to strengthen the collaborative sharing and out-of-class learning that naturally occurs in and around the academic program (Sherry and the Internet Task Force, 1996; Sherry & Myers, 1996; Sherry, Myers, and the Internet Task Force, 1996; Wilson, Ryder, McCahan, & Sherry, 1996). Students with resources of their own become less dependent on professors and courses as sources of expertise, and move toward a wider variety of learning activities and interactions. Over time, these informal interactions come to constitute a learning community, and become as important to the education of participants as formal courses.

*Internet discussion groups.* Globally, a swell of informal or distributed learning initiatives has taken shape, using the Internet as its medium. Indeed, the Internet serves as a sort of "petri dish" wherein a variety of colonies of organisms and learning experiments have begun to grow. Many of these learning initiatives are independent of traditional instruction. Participants in a listserv such as ITFORUM, for example, may engage in high-level discussions, yet their participation may not be reflected in course credit and may not be governed by a teacher or instructional designer (Bennet, Al-Ghafry, Rieber, & Leshin, 1996). People may especially benefit from participating on global forums when expertise is rare within their local environment. In a way, the monopoly of expertise is being shaken loose from the universities, big businesses, large cities, and developed countries, and is being distributed throughout the world via the Internet. The opportunities afforded by new communications technologies will eventually have profound implications for how we think about learning and instruction.

## LEARNING THROUGH COLLABORATIVE SUPPORT

Learning can happen in a variety of ways within a DLC; however, a common pattern of mutually supportive interaction will tend to emerge, outlined by the following seven steps:

1. Articulate the learning need. This becomes the learning "problem" or goal.
2. Seek help in a group forum.
3. Engage in a help consultation.
4. Assess learning.
5. Share the solution with the group. Restate the problem and solution if necessary.
6. Archive the interaction or the restated solution for future reference.



7. Repeat this process, of any part, as necessary to support learning.

Each step is described in turn.

*Articulate the learning need.* A community member becomes aware that she or he lacks some skill or knowledge. Exactly how the needed knowledge relates to a particular task need not be fully specified; a learning goal does not always have to be justified by reference to an external problem. Instead, a simple desire to know can become the "problem" or learning goal for the individual.

*Seek help in a group forum.* The community member then seeks help, often in a public forum, such as a distribution list or listserv maintained by the DLC.

*Engage in a help consultation.* Another community member helps or consults with the first member. Help consultations may draw on a variety of resources:

- human resources;
- archived interactions;
- Frequently Asked Questions (FAQs);
- information search tools;
- performance supports;
- instruction.

Community members may discuss the issue at length, publicly-Or the help consultation may be simple, direct, and private.

*Assess learning.* Community members have a variety of tools to use in testing out new knowledge or skill. If the help consultation provides incomplete information, the community member may succeed in filling in the missing information. A recommended procedure can be tried out; if it fails and the problem can't be solved, the person goes back and reports the problem and repeats the interactive process. If new knowledge is offered, it is tested against prior knowledge and understanding. Information can also be checked across members of the group. Typically, a combination of self-assessment and consensual agreement is used to assess new knowledge.

*Share the solution with the group.* After new knowledge or skill is tested and confirmed, the solution is shared with the group. A restatement of the original problem and its solution may be helpful, especially for future reference.

*Archive for future reference.* Ideally, every DLC interaction should be archived for future retrieval. If an automatic archiving system is not in place, then each solved problem or significant interaction should be stored in a public location for future access by any member of the group.

*Repeat as necessary.* Although listed in steps, the general process is flexible. Any step or set of steps may be repeated in the process of generating solutions to learning problems.

The process above typifies interactions where a specific learning need is identified. A common alternative is the kind of informal discussion found on listservs and discussion groups. Frequently, knowledge sharing is not problem-driven but rather conversation-driven. In those cases, the interactions are less strategic and defined, but learning is nonetheless supported by mutual sharing and concern around a topic of interest.

## MANAGING EXPERTISE IN THE DLC

Expert and novice roles fluctuate within a learning community. Brent is an expert at one thing, Martin at another. Some members may be expert at group cohesion, serving a critical support role in keeping the community together. Others may participate irregularly, but have important input at certain junctions. Certainly labels such as "expert" or "novice" do not capture the richness of the knowledge that is distributed throughout a learning community.

Whatever people's expertise, there must be a legitimate self-interest to sustain individual participation. Community members must each feel a personal return on their investment in the group. There are, however, a number of grounds for self-interest. Some people get tremendous satisfaction out of helping others. Some people like to think of themselves as being a source of expertise to others. Some people have a need to feel connected to groups of people, even when significant new learning happens only irregularly. Some people develop a sense of loyalty and constancy, committing time and resources to a community because it helps them feel at home. All of these may be reasons why a person with considerable expertise may choose to participate in a diverse learning community.

Martin has an example from engineering. An Internet discussion list centers around new standards for the next generation of the SCSI interface. List members have a variety of motives for participating. A sales and marketing person may feel like a novice, with a need to upgrade his understanding of technical details. An experienced engineer may participate because she feels a need to maintain a link to "people out there" and understand people's reactions to proposals and possibilities. This knowledge will then help her in establishing better standards. The list thrives because people depend upon each other and need the different kinds of expertise available within the group.

One challenge DLCs have is keeping both experts and novices happy interacting within the same group. Novices have a tendency to ask inappropriate questions and to not use the full resources available to them. Experts can feel overworked, exploited, or unchallenged-feeling that they aren't learning anything. By way of illustration, Brent recently received a query from a student at another university:

Dr. Wilson:

I am a graduate student with [another] University in [another city and state], studying computer applications, both on- and off-line, for the urban classroom. I have become overwhelmed by the amount of information and services on the internet. I am interested in current research regarding instructional technology, accessibility issues, educational software development, networked projects, and business partnerships. Any information or contacts you can provide will be most appreciated. I need a good source of direction. With all the information available, it is difficult to know where to begin. Thanking you in advance for your assistance,

[student's name]

Brent responded:

Hi [student's name]--

With all the issues you describe an interest in, it's no wonder you feel overwhelmed! My favorite site on the Internet is our own IT Connections, available off my homepage at

<http://www.cudenver.edu/~bwilson>

I send you to my homepage cause I can't recall the specific URL to IT Connections. A few hours spent on IT Connections should give you a couple of leads, then you'll have to take it from there.

Good luck in your studies,

Brent

Here is a case where a novice is feeling overwhelmed by the Internet's many resources, feeling also a need for some human hand-holding. The hope is that a flesh-and-blood expert can provide some guidance more specific or valuable than the generic searching or linking found on the Web. On the other hand, the "expert" can't solve the student's problems. There are so many resources that might relate to her interests. We would have to engage in an extended conversation to ascertain her state of knowledge and her specific learning goals. Brent responded with general encouragement and a generic reference to some academic links to her interests. The result? More than likely, the student felt the interaction was of limited value, and Brent felt a little bit put upon, and a little bit frustrated at not being able to be of more help.

How then does a learning community deal with the varying needs of its members?

We offer several possible strategies that DLCs might choose to adopt in addressing this problem, summarized in Table 2.

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For Everyone:

- Varied levels of discussion and activity (e.g., beginners vs. advanced)
- A process that inducts beginners and moves them through increasing levels of expertise

--Moderated lists

For the Expert:

- Public and private accounts
- Allow anonymous posts
- Private groups
- Temporary consultations, participation

For the Novice:

- User-friendly search and navigation tools
- Private consultations and re-directions
- Paid advisors/help specialists (e.g., AOL guides)
- Standard problem-solving protocols (e.g., "have you read our FAQ?")

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Table 2. Possible strategies for managing expertise within distributed learning communities.

The strategies suggested in Table 2 are possibilities only. Several would curtail or constrain free interaction within the group, thus inhibiting the distributed nature of the learning community. Care should be taken not to fix a problem that doesn't exist. Specific policies can best be determined by consensus within the community, and evolve over time as needs change.

### INSTRUCTIONAL DESIGN VERSUS LEARNING COMMUNITIES

Both instructional design (ID) and DLCs can lead to learning. However, other things being equal, we believe that open systems are preferred because they address more fundamental learning outcomes, e.g., self-directed inquiry, learning-how-to-learn, etc., and tend to be more closely situated within an authentic performance environment. The following table presents an outline of variables to consider when choosing between DLCs and designed instructional systems.

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Conditions working in favor of instructional design:

- content is stable over time;
- content is well-defined or rule-based;
- expertise is available;
- representation demands are heavy;
- mastery of discrete knowledge is valued;
- culture is conservative, slow to change.

Try DLCs if these conditions apply:

- content is change, new, complex, or ill-defined;
- expertise is scarce or distributed across a number of people;
- literacy and metacognitive skills are available;
- community-directed, situated support for learning is valued;
- culture supports risk-taking, innovation.

Table 3. Factors to consider when deciding between designed instruction and distributed learning communities.

Note that the criticality or the advancedness of the skills are not listed on the table. We believe these skills are relevant but not determining factors when deciding between designed instruction and DLCs. That is, DLCs can be effectively used at varying levels of expertise, and with critically important content. Where certification of expertise is necessary, however, individuals should demonstrate their expertise using accepted assessment methods, regardless of the method of learning support.

In general, the more stable, defined, and discrete the content, the more sense to design instruction to meet the learning need. Contrariwise, the more volatile, ill-defined, and complex the learning needs, the more sense to try to cultivate DLCs as a support strategy. The availability of expertise and the support from the surrounding culture are other important factors in determining a learning approach for a particular group.

In the end, the decision between designed instruction and DLCs is partly one of utility and partly one of value. Given the same ends, DLCs may prove more or less effective in accomplishing learning. Seen in this way, the issue is one of utility. Taken the next level, however, designed instruction cannot be said to accomplish the same ends as DLCs, and vice versa. At this point, the decision necessarily rests on the question: What learning ends do we really value? Members of distributed learning communities will come out of their experience with different skills, perspectives, and appreciations than graduates of an instructional program. These differences must be respected and

considered when choosing between approaches to learning support-in addition to the utilitarian considerations mentioned above.

### CONTROL OF DLCS

As we emphasized above, because DLCs are complex adaptive systems, control is distributed throughout the community. This can be both a strength and a weakness. Examples of problems that can arise include:

- pornography access in a middle school;
- bomb-assembly instructions two or three links away from your homepage;
- competitor "air space" on the company-sponsored net;
- flaming and dissent on discussion groups;
- addictive and inappropriate behaviors;
- mismatch between DLC learning and externally-defined curriculum objectives.

Deciding how to deal with these kinds of problems brings us back to the core differences between complex, adaptive learning communities and instructional systems. We may choose to respond to problems by seeking to limit the openness of resources available to a DLC. Possible methods for exerting some measure of control over DLCs include:

- list moderation;
- control over membership;
- externally mandated rules and conventions;
- imposed problems or learning activities;
- imposed assessment standards.

Such attempts at controlling DLCs constitute a compromise of their nature. Thus the learning community becomes something of a hybrid between a DLC and a designed instructional system. Such compromises may be necessary in schools or other settings, but they should be implemented very carefully, since interventions can have unpredictable effects on group functioning. This again is another area that we know very little about, in need of further research.

### CONCLUSION

Originally, instructional designers thought they were in the business of designing instructional systems to meet prespecified learning objectives. But first the constructivist movement-and now communications technologies themselves-seem to be threatening this conception as the sole way to support learning. Increasingly,

people are learning without help from designed instruction! In many settings, in fact, "natural" learning is more prevalent than "designed" learning (Resnick, 1987). We believe that the situation requires a re-examination of our core roles. Are we in the business of designing instruction or of supporting valuable learning, wherever it may happen? The answer to this question will result in either a narrow or broad interpretation of our role and its relationship to non-instructional forms of learning.

Our own belief is that distributed learning communities are proper objects of study. We should seek to understand how such communities function, how they grow, how they can be nurtured, and how they can be replicated across diverse settings. But nurturing is different than designing. We must respect the integrity of the community. In time, we may come to think of ourselves more as "learning technologists" than as "instructional technologists", and "learning support specialists" more than "instructional designers." But these are issues best addressed at length in a separate paper.

The development of new communications, storage, and representation technologies constitute a watershed in the history of open learning systems, making DLCs more feasible than they have been in the past (Ryder, 1994, Ryder & Wilson, 1996). This is a situation where the technology allows a concept to take shape, and the interplay between technology and theory will likely continue in the years to come.

We need to better understand how established instructional systems (e.g., school classrooms) can migrate toward greater openness, eventually resulting in at least a partial displacement of instruction for a community model. A transition model that tracks this growth trajectory would be a most welcome research agenda in the coming years.

In the meantime, we will continue studying how distributed learning communities take shape, how they self-organize, and how they support learning. Documenting cases empirically is an important part of that agenda, and will help to clarify several issues merely touched on in this paper.

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