

**Online Collaborative Learning:
A Social Activity**

by

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Over thirty years ago, in the spring of 1970, Murry Turoff invented computerized conferencing by using computer facilities without the permission of his organization's MIS department. His punishment suited the “crime”: his terminal was taken away for several weeks.

Today, Turoff's invention is at the heart of a revolution in education which promises to improve access to learning, connect geographically-dispersed learners, promote life-long learning, build knowledge-networking communities and produce education that can be *more effective* than classroom-based activity.

Our objective is not to merely duplicate the characteristics and effectiveness of the face-to-face class. Rather, we can use the powers of the computer to actually do better than what normally occurs in the face to face class.
(Turoff, 1995).

We may, *if* we attend to both the technical designs of the systems to be used and the adragogies to be applied (Hiltz and Turoff, 1978). The combination of the two has been labeled Online Collaborative Learning. This paper will provide a definition of OCL which will allow a discussion of its problems and possibilities in making learning more effective and will point to critical indicators of success so we may better judge if Turoff's '70s dream is coming true in the 2000s.

Online Collaborative Learning, for the purposes of this discussion, may be defined as: the use of asynchronous computer communication networks to provide social spaces for communities to collaboratively participate in the construction of knowledge. A brief discussion of the various key components of this definition follows.

Collaborative learning is a process which emphasizes group efforts amongst educational activity organizers and participants leading to the construction of new knowledge (Johnson and Johnson, 1975; Bouton and Garth, 1983; Bruffee, 1993). It assumes:

... that knowledge is a consensus among the members of the community of knowledgeable peers – something people construct by talking together and reaching agreement. (Bruffee, 1993)

Kuhn referred to the consensus as a “paradigm”- a set of models which provides a community, especially a scientific community, with shared coherent traditions. The study of these paradigms is what mainly prepares students seeking to join the community (Kuhn, 1962, p. 10). Bruffee outlines the process by suggesting that students re-acclurate - break from their previous communities of knowledge - by working collaboratively with other students to create transition or support groups while they learn the language, mores and values of the community they are trying to join. They work in groups at the boundaries of the community by talking and writing collaboratively, with the guidance of teachers, until they gain access to the community as full-fledged members (Bruffee, 1993, p. 20). The collaborative learning in which they participate can be thought of as a type of cooperative work (Turoff, 1995). In fact, the term derives from the concept of co-labour, where people work together to produce (Harasim, 2003).

Collaborative learning becomes *online* collaborative learning when it takes place via computer communication systems. It is the capability of the computer system to store, search and display the communications of its users which excites educational technology designers such as Turoff. The technical design of the systems is crucial, especially in how it allows users to handle problems related to information overload. Turoff (1995) points out that “a key element in the design of software to support distance education is the minimization of information overload for both the instructor and the students”. The processing powers of the computer could allow learners to quickly and easily store, search and display information including discussion units such as messages, paragraphs and sentences, plus intellectual resources such as ideas, themes, discussion, convergences or opposition. It is this capability which allows the possibility of making online collaborative learning more effective than face-to-face.

A key technical attribute of OCL is that it uses *asynchronous* computer systems as compared to synchronous technologies such as telephoning or video-conferencing. Asynchronous technology is technology accessible by participants at any time of their choosing (Bates and Poole, 2003). The asynchronicity of computer conferencing provides it with one of its most significant advantages: the capability of learners to use it at their convenience (Hiltz, 1994). Asynchronous formats are ideal for geographically-dispersed communities of people who live in different time zones, have different

preferences for using their time and have varying levels and forms of hardware, software, and internet access capability (Agger-Gupta, 2004, p. 46).

Because it is primarily a storage system which allows access to users at their convenience, the communication units within it are available to be searched and displayed in many ways: linear according to posted times; organized by themes or topics; and threaded according to related references (Agger-Gupta, 2004 p. 46). Discussions become not real-time events which are lost like performance art, but resources to be consulted and researched.

The computer's technical capabilities and the asynchronous nature of computer conferencing can be used to enhance collaborative learning. Conferences can be opened for small groups. Question and answer facilities can require that students answer an instructor's question before they can enter a conference to see the answers of other students. Commonly editable areas can be created. Pen names can be adopted for role-playing. Most importantly, the messages can form a database which can be searched by participants in many ways (Hiltz and Turoff, 1978; Turoff, 1995; Harasim et al., 1995).

The technical design of the system alone, however, cannot ensure collaborative learning. The andragogies used are also crucial. It was in the 1980s that collaborative learning concepts began to be considered in the analysis of computer networking for group work and education ((Johnson-Lenz and Johnson-Lenz, 1982; Hiltz, 1986; Black, 1985; Harasim, 1987). In 1982, the first online educational programme was conducted (Feenberg, 1993). Two years later the first totally online undergraduate course started (Hiltz, 1986). These early efforts convinced many investigators that a sense of community was at the core of effective online learning.

The most basic premise from which all online teaching should begin is that the goal is to build a learning community and to facilitate the exchange of ideas, information and feelings among the members of the community. (Hiltz and Benbunan, 1997)

Online collaborative learning is a *social* activity in which community members work together to construct new knowledge. It takes place in the social spaces created by the conferencing systems (Harasim, 1987; 1990). It is the social aspect of OCL which distinguishes it from elearning approaches such as individualized Online Distance Education (ODE) and Online Computer-based training (OCBT). ODE in this context

refers to individuals using computer communications to access prepared lesson materials and background resources. They read the pre-packaged information and complete assignments which are sent by email to tutors for grading. An example of an educational institute that relies heavily on ODE is the UK's Open University. It has hundreds of prepared courses which individuals can take as they study for a degree (Open University, 2004). Yet ODE is not much different from traditional distance education which uses the postal system and telephone access to tutors. Online Computer-Based Training differs from ODE in that learners make more use of computers as they interact with programs to learn particular skills. Both ODE and OCBT are based on learners working individually in order to receive a pre-determined body of knowledge. Unlike in online collaborative learning, participants do not work with other people in order to construct new knowledge. This is not to say that ODE and OCBT do not have valuable applications. Some individuals may prefer to study on their own at their own pace and without the stresses related to group work. For them ODE might be appropriate. As for OCBT certainly there are particular subjects (such as air traffic controlling) for which it is most suitable.

However, if humanity is to progress in its understanding, education cannot be only about learning or memorizing established bodies of knowledge, because at the core of education is a comprehension of how new knowledge is created. Students in collaborative learning communities learn the set of concepts – the paradigm - common to the community they aspire to join as full members. This, as Kuhn (1962, p. 11) has pointed out, will “seldom evoke overt disagreement over fundamentals”. Only when the number of anomalies which puzzle a community reach a crisis will it begin to shift towards a new paradigm (Kuhn, 1962, p. 82). The crucial point is that if the members of the community have not learned how to construct new knowledge together they will have great difficulty in making the shift. If this view has value, it is difficult to see how ODE and OCBT may have more than limited use.

Online collaborative learning, on the other hand, offers greater possibilities, if only because of the number of participants it can involve. If humanity progresses in understanding by talking and writing collaboratively in communities, multiplying the numbers involved in this process may dramatically increase knowledge creation. *Networking*, a crucial component of the definition being proposed, is bringing together

millions of people in communities large and small. “Learning networks are groups of people who use CMC (computer-mediated communications) to learn together, at the time, place and pace that best suits them and is appropriate to the tasks” (Harasim et al., 1995) Learning networks are used in formal education such as university courses and informal networking such as in the development of open source software. This is software which is created by communities of volunteers who write it, license it for free distribution, and ensure that its underlying programming code is available for improvement (Raymond, 2000). Many open source projects, such as the OpenOffice.org suite of office productivity tools, use online conferencing to connect large numbers of programmers and users. (Collabnet, 2004).

These, then, are the key concepts which should be included in a precise definition of OCL: collaborative learning; online conferencing; asynchronous communications; community; social activity; knowledge construction; and networking. The study of how they come together to promote education has produced a rich literature. The indicators which point to their success or failure become crucial instruments for OCL investigators.

The possibilities and techniques for using computer communications for learning via networks have been extensively described (Hiltz and Turoff, 1978; Harasim, 1987; Harasim, 1990; Harasim, 1993; Mason et al., 1993; Hiltz, 1994; Harasim et al., 1995; Khan, 1997; Porter, 1997; Harasim, 2000; Feenberg, 2002; Anderson and Eloumi, 2004).

A number of investigators have discovered that collaborative learning contributes to the educational process and have outlined how it does so (Harasim, 1990; Harasim, 1993; Hiltz, 1994; Harasim et al., 1995; Gokhale, 2002; Gay et al., 1999; Carr-Chellman et al., 2000; Curtis and Lawson, 2001; Dufner et al., 2001; Harasim, 2002; Hafner and Ellis, 2004; Campos, 2004). Some of the more significant findings in these studies include:

- that, in keeping with Bruffee's (1993) position that knowledge is a social construct, intellectual convergence through collaborative learning is key to the success of online learning (Harasim, 2002);
- online networks can best support learning if a carefully planned series of collaborative learning activities is used (Hiltz, 1997);
- when students are actively involved in collaborative learning online, the outcomes can be as good as, or better than, those for traditional classrooms (Hiltz et al., 2000);

- the role of the online facilitator is intrinsically collaborative (Campos et al., 2001; Teles et al., 2001);
- if guided correctly, it can be a “women-friendly” place even if the instructor is male (Herring, 2000; Shea et al., 2000);
- and it can create a sense of community amongst participants (Rovai, 2001).

OCL can contribute to learning in a number of ways. First, because of the asynchronous nature of the medium, it allows time for considered responses and so critical thinking skills are enhanced (Gokhale, 2002). This can improve in-depth investigation of a topic (Harasim, 1990). OCL can also provide social support and encouragement for individuals and thereby increase the total effort put forth by group members (Benbunan-Fich and Hiltz, 1999). Because of the lack of social presence, student concentration on the content of communications rather than the presenter is promoted (Harasim, 1990). This lack of social presence also produces a more egalitarian, democratic environment in which the instructor becomes a guide for knowledge construction instead of a lecturer passing on a pre-packaged body of knowledge (Campos et al., 2001). Access to the instructor by participants is improved (Hiltz, 1995). In the end, the participants in online courses have an increased perception of learning (Benbunan-Fich and Hiltz, 1999).

Yet there are problems to be addressed. While the total output of the group may be augmented with the use of collaborative learning, it may do so because the group's members go along with group decisions in order to facilitate the process (Harasim, 1990). This may lessen confidence in the decisions taken by the group (Benbunan-Fich and Hiltz, 1999). Asynchronous communications may promote critical thinking, but it may also produce irritation related to the gap in response times, so-called “login-lags” (Benbunan-Fich and Hiltz, 1999). Frustration may arise when other participants do not participate in the collaborative learning exercises (Benbunan-Fich and Hiltz, 1999). Online discussion may be perceived as “slow” (Meyer, 2003). Because the medium is based on text, participants who are not working in their mother tongue may have problems writing (Morse, 2003). In addition, while the technology provides great benefits, such as increased access to education, it can also cause problems for people with poor equipment, faulty electronic supply or inadequate internet services (Morse, 2003).

An extensive list of the ways OCL may contribute to the success (or lack of success) for effective learning cannot be provided in this short a paper, but even if it could, a simple listing would not be helpful. What is needed to bring sense to the large body of seemingly disparate findings is the use of a theoretical framework which provides a coordinated, if not comprehensive, set of indicators of success.

Our definition of OCL points to the need for indicators in a number of areas including: participation; community building; and intellectual development.

Participation is at the core of the OCL experience. It determines if participants are “seen” in the activity, the success of collaborative learning activities (which depend on group work) and other factors, including perceptions of learning. It is considered so crucial in formal education that instructors force students’ participation by the use of grades (Hiltz, 1997; Rovai, 2001). Indicators of participation can be quantitative, such as number of messages entered, replies to other messages and access times. Dropout rates can be measured by the lack of message-entering and accessing the system: studies of university students in the United States have shown slightly higher dropout rates in online courses when compared to face-to-face courses (Hiltz, 1997). The number of women as compared to men can also be counted, allowing some investigators to suggest that OCL encourages more participation of women in traditionally more male-dominated courses such as engineering (Morse, 2003). Access by physically handicapped people can be analyzed to see if OCL encourages more to be involved in educational activities. “Lurking” rates can be measured as well. Lurking happens when participants read messages in the conferences but do not enter messages of their own. This is seen as negative in formal educational courses, but the analysis of informal OCL, where people voluntarily come together in conferences to learn, shows that “active lurking” is valuable. It shows that participants are keeping up with the communication flows and from time to time contribute, presumably on the subject matter which interests them (Harasim, 2002).

Qualitative analysis of participation is also crucial to the study of OCL. The trust participants have in a group, for example, can determine active participation or drop out rates (Coppola et al., 2004). The feelings of participation can be another important indicator. A study by Shea et al. (2000) involving 5000 students showed that 79.1% of them participated as much or more online than in the classroom, More than twice as many reported that they participated more online (47%) than in the classroom (19.2%).

Community building in OCL is another crucial area of study for investigators (Brown, 2001; Ruhleder, 2002; Harasim, 2002). As in the study of participation, there is a need for indicators of success. One instrument which includes measurable indicators is Rovai's Classroom Community Scale (Rovai, 2001; 2002a; 2002b). Rovai's search of the literature suggested that the characteristics of sense of community, regardless of setting, include feelings of connectedness, cohesion, spirit, trust and interdependence among members. The scale was designed to test for these characteristics: "10 items related to feelings of connectedness and 10 items related to feelings regarding the use of interaction with the community to construct understanding and the extent to which learning goals are satisfied with the classroom setting." (Rovai, 2002a p. 201). Because it provides clear indicators OCL investigators can measure the sense of community which is generated in a conference and how it develops over time.

Intellectual development during a conference is another crucial factor in the study of OCL. If we cannot tell how it builds and manifests itself we are less likely to create successful activities which hope to encourage it. Meyer (2004) studied four frameworks which included indicators of intellectual development and concluded that not one was sufficiently comprehensive to cover all the possibilities. Investigators "...may need to use a particular frame in one situation, and another in others, depending on the discussion or learning situation." She also concluded that the frames she studied lacked a way to "assess how a group conversing online works as a group, how it works together to develop an understanding of and solutions to a problem." Another problem with all the frameworks, which was not mentioned, is that they are all founded on the study of graded students. Some learning communities, such as those involved in online labour education, do not use grading systems.

One of the first theories of how online collaborative learning proceeds is Harasim's (Harasim 1990; 2002; 2004). It was initially created for the analysis of online courses, but was later informed by the study of non-graded projects such as the Global Authors Network (GAN) and the Global Educators' Network. It outlines three main phases for intellectual development in an OCL conference or set of conferences and provides clear indicators of each:

Phase 1. *Idea generating*. In this stage multiple unconnected ideas are presented by the group. Indicators include verbalization, brainstorming, information generating and democratic participation.

Phase 2. *Idea linking*. The group starts linking or clustering ideas. Indicators include an increased number of replies, references to other messages and a qualitative change in the nature of the discourse.

Phase 3. Intellectual convergence. The group coalesces around common ideas. Indicators include an increased number of substantive contributions and more conclusive statements supported by the group.

Indicators such as these allow investigators to analyze the activity in OCL conferences in order to better understand how intellectual development proceeds so that it can be encouraged by course design, instructor guidance and participant involvement.

This paper has suggested a definition of Online Collaborative Learning, described its key components, differentiated OCL from Online Distance Education and Online Computer-Based Training, and discussed three major categories for indicators of success.

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