

Considering Communities of Learners When Creating an E-learning Course

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Abstract:

There are many definitions of the term *community of learners*, but regardless of which is used, it is important for instructional designers, instructors, and facilitators to understand how these informal groups can enhance – or thwart – a learning event or program. In this paper, we are particularly interested in “virtual” communities of learners, the challenges they face, and some specific ways that their needs can be met in a web-based learning program designed to facilitate the development of expertise in handling sensitive pharmaceutical products. The design research approach and methodology of the study are explained, together with emerging design principles.

Community of learners

Community of learners and *learning community* are terms commonly used but with definitions that vary widely. Brown and Campione (1996) say that the fundamental activities of a community of learners are to conduct research, share outcomes, and perform a consequential task. Perry and Edwards (2010) define an online learning community as a “shared culture in the online classroom, including shared values, norms, and beliefs” (p.132). Similarly, Boyer (1995) says that a community of learners shares a “purpose, good communication, and a climate with justice, discipline, caring, and occasions for celebration” (p. 20). Other writers, such as McLoughlin (1999), use the term *community of learners* in the context of providing a learning environment and solution that meets the needs of a diverse group of learners, whether geographically or culturally dispersed.

Another way to understand a community of learners is to use an ecologist’s definition of community: “A group of interdependent organisms inhabiting the same region and interacting with each other” (Wiktionary, 2010). This view emphasizes the concept of the learners working together for the benefit of all. The “same region” could be interpreted as a virtual connection that links the learners. Indeed, communities of learners can exist as a study group in a dorm or library study room that may be informally “self-organized” (Amhag & Jakobsson, 2009, p. 656) or more formally be “an intentional structuring of the students’ time, credit, and learning experiences to build community, and foster more explicit connections among students, faculty, and disciplines” (Smith, 2001, p. 5).

A distinguishing aspect of a community of learners is that no matter whether they self-organize or are randomly or selectively placed into a team, the members actively learn through cooperative and collaborative communication and activities (Biasutti, 2011). Members connect themselves with the learning expectations and goals (Anderson & Simpson, 2004). Social learning theorists, building on the work of Vygotsky (1978) in the early decades of the 20th Century, have advocated that learning with and from others is fundamental in the acquisition of knowledge and skills.

How does a community of learners differ – or not – from a community of practice? Wenger (1998, p. 45) describes a community of practice where “collective learning results in practices that reflect both the pursuit of our enterprises and the attendant social relations. These practices are thus the property of the community created over time by the sustained pursuit of a shared enterprise.” He later says that a community of practice “includes learning, not only as a matter of course in the history of its practice, but at the very core of its enterprise” (p. 215). Learning occurs in both communities of practice and communities of learners, but “the enterprise” of a

community of practice is to help the community member to develop an identity: “we accumulate skills and information, not in the abstract as ends in themselves, but in the service of an identity” (p. 215). While there is considerable overlap, the differentiator is the “enterprise”: for participants in a classroom or in a structured e-learning course, the enterprise is learning.

Characteristics of a community of learners

Rovai (2001) summarizes some of the benefits of a community of learners such as increased persistence in courses, an increased flow of information, cooperation among group members, heightened sense of engagement, and feelings of less stress. Two important characteristics of a successful community of learners that are found in the literature include:

- Collaboration – Learning occurs through “interactions of individuals with other individuals” and as “individuals exercise, verify, solidify, and improve their mental models through discussion and information sharing” to construct a shared understanding; the more knowledge that is shared the more that is learned (Leidner & Jarvenpaa, 1995, p. 268).
- Cooperation – Learners collaborate through cooperation as they accomplish a group activity (Nam & Zellner, 2011). These authors identify three components of cooperation: (1) *Positive independence*, where each learner realizes that each and every member of the learning community needs to succeed if the community is to succeed; (2) *Individual accountability* is when the success of one individual is shared fairly with other members of the community; and (3) *Group processing* is when the members of the learning community evaluate the members and outputs of the group in order to make improvements to the group’s activities. Group processing would include the control, monitoring, and evaluation that takes place as the community works to achieve its goals (Beishuizen, 2008). Cooperation requires an engagement of the learners with each other (Biasutti, 2011).

Based on the above descriptions and characteristics, a working definition for *community of learners*, to be used in our work is:

Community of learners: An interdependent set of individuals that cooperates and collaborates as they conduct research, share outcomes, and perform a meaningful task.

Success factors for an online community of learners

A community of learners can exist physically or virtually, the latter being connected through computer mediated communication (CMC). Because of the growing use of e-learning, the online form of communities of learners has been the subject of more research in recent years. To create and maintain a successful online community of learners, that is, an environment in which the desired outcome of learning and the additional benefits described can be achieved; there are a number of factors that must be present. These include:

Retention of community members. If a community of learners is to work collaboratively and cooperatively, the learning environment (whether online or face-to-face) needs to first acquire and then retain learners in that community. Frankola (2001) cited literature reports where dropout rates for online learners ranged from 20 to 50% and were 10 to 20% higher than dropout rates of face-to-face courses. The reasons for this higher attrition rate, according to the author, are due to a combination of instructional design, instructor/facilitator, technology, and learner issues. Researchers have identified individual learner characteristics that are important for an e-learner to be successful. For example, the e-learner needs to be self-regulated and self-monitored (Salomon & Almog, 1998); self directed, that is with high curiosity and a willingness for self-learning (Chang, 2006); and have a mastery orientation which emphasizes “comprehension over performance” (Salas, Kosarzycki, Burke, Fiore, & Stone, 2002, p. 144). Unfortunately, some participants in an e-learning program may fail because they do not have the ability to self-learn; many learners have only had traditional classroom experiences, and they are not prepared to function in a distant e-learning environment (Rossett & Schafer, 2003), perhaps because of a lack of social presence.

Social presence. Social presence was first defined as, “the degree of awareness of another person in an interaction and the consequent appreciation of an interpersonal relationship” (Short, Williams, & Christie, 1976, p. 65). Garrison (1997) defines it as the “degree individuals project themselves through the medium verbally or nonverbally” (p. 6). Perry and Edwards (2010) conclude that the interaction of learners in an online learning environment is connected to the “experience of social presence” (p. 132). They describe designs and methods that can be used to facilitate interaction and social presence, strengthening a community of learners. Work by Tu and McIssac (2002), using quantitative and qualitative methods, identified four dimensions that positively influence social presence: social context, online communication, interactivity, and privacy. These dimensions can be affected by the:

- Underlying technology and technological environment (e.g., some types engendering a more positive or negative response, due, in part to ease-of-use; affordances; availability and location of equipment);
- Design of the course (e.g., selection of group size for learning activities and tasks)
- Characteristics, skills, and attitudes of the participants (e.g., keyboarding and literacy skills, timely response to messages); and
- Characteristics, skills, and attitudes of the facilitator/instructor (e.g., communication strategies, informal conversation style).

Safety, respect, and trust. Various authors (Quan-Haase, 2005; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Tu & McIsaac, 2002) have identified trust as a critically important element in a community of learners. Taylor (2002) puts it simply: “Collaborative teamwork is too risky to happen without a culture of trust. [Learners] must believe it will be OK if they make a mistake or try something new and it doesn’t work out” (p. 43). For successful learning to take place, there must be a safe learning environment (Bruffee, 1993). Based on surveys, Tu and McIsaac (Tu & McIsaac, 2002) found that “trust issues played a very critical role in online interaction among students. In the CMC environment, it requires more time for students “to become acquainted and to develop a trusted relationship” (p. 142). Kilpatrick, Barrett, and Jones (2003) say that respecting the diversity of those in the community of learners contributes to learning because of a climate of trust and the encouragement of risk taking. Conversely, learners who feel less comfortable and safe in a learning community are those who contribute less in various forms of communication (Haythornthwaite, Kazmer, Robins, & Shoemaker, 2000). An important element in developing a safe community of learners is respect and sensitivity for different cultures, or what is now being called *cultural competency* (Grote, 2008).

Multi-culturalism. The growth in e-learning world-wide means that the community of learners is becoming more and more diverse in terms of nationalities, backgrounds, and culture (Wang & Reeves, 2007). The current understanding of what culture is goes beyond the work of Hofstede (1980) that considered a person’s “culture” was primarily attributable to the person’s nationality and ethnic origins; rather, culture is now seen more broadly, as: “the patterns shaped by ethnicity, religion, socio-economic status, geography, profession, ideology, gender, and lifestyle” (Branch, 1997, p. 7). In the design, production, and on-going use of the e-learning program, designers, developers, and facilitators/instructors need to be sensitive and aware to potential issues of culturalism: “e-learning courses are cultural artifacts, embedded with the cultural values, preferences, characteristics and nuances of the culture that designed them, and inherently creating challenges for learners from other cultures” (Edmundson, 2009, ¶5). Unfortunately, multi-cultural sensitivity is often not included in e-learning environments: Rogers and his colleagues (Rogers, Graham, & Mayes, 2007) point to several examples where there was a “severe lack of attention among instructional designers as a whole towards important issues of cultural diversity, resulting in the alienation of many learner groups” (p. 199).

Instructors/facilitators/mentors

In addition to the “students” who are participating in the community of learners, instructors, facilitators, and mentors will influence the community’s success. Having these educators actively involved in monitoring and evaluating the conversations and dialog – collaborating – can help learners and teams of learners progress to higher levels of understanding and accomplishment (Amhag & Jakobsson, 2009). Lee and McLoughlin (2010) identified special challenges facing distance learners using web technology, including, “lack of feedback and instructor contact”, “feelings of isolation and alienation”, “lack of experience in studying at a distance, and lack

of technical training in using the technologies involved with web-based learning” (p.65). The authors discuss the impact of distance in learner-learner relationships: “... distance learners endure the disadvantage of being able to interact in person with other students, which can put a significant damper on their motivation and enthusiasm for study” (p. 63).

Instructors and mentors must be actively involved in monitoring postings and communications by the learners and helping support learners who may not be contributing (Frankola, 2001). A challenge for the instructor, particularly when working with a culturally diverse community of learners is when and how to intervene, for example, when a learner has not been participating.

Instructional and visual design

Another aspect of community of learners is the need to design a learning solution that is sensitive to the participants from multiple cultures that would be using it. Factors like interface design, icons, color, tasks, internal/external support, and examples need to be considered (Chen, Mashhadi, Ang, & Harkrider, 1999; McLoughlin & Oliver, 2000; Stoney & Wild, 1998; Wang & Reeves, 2007). Since culture has an impact on ways we learn (Kim & J., 2002; Rogers, et al., 2007; Selinger, 2004); provide, receive, and value feedback (Ku & Lohr, 2003; Uzuner, 2009); (Jim it looks like there is a problem with your endnote for the Kim reference in this group) and reason (Bentley, Tinney, & Chia, 2005; Chisholm, 1995), these factors must be taken into consideration as the learning course is being designed. Good visual and learning design contributes to the success of the individual learners and collective community of learners

Based on the work summarized above, achieving a community of learners where cooperation and collaboration occurs in a physical or virtual environment requires that designers, developers, and instructors/facilitators create, enable, and sustain a safe, respectful, multi-cultural setting with learners who are willing and able to contribute and be active participants. The relationship among the elements is critical in creating an effective community of learners. In the next section, we describe the case where we are endeavoring to achieve this.

The problem: background

Vaccines, insulin, and many medicines produced using biotechnology, are temperature sensitive and need to be stored and transported at controlled temperatures, for instance 2 to 8 degrees centigrade (Milstien, Kartoğlu, & Zaffran, 2006). Exposure to temperatures outside this range can result in damage to the drug and cause safety issues or lack of effectiveness. A “cold chain” is the integrated system of equipment (e.g., shipping containers, refrigerators, trucks), procedures, records, and activities used to handle, store, transport, distribute, and monitor temperature-sensitive products (Afsar & Kartoğlu, 2006). The allusion to a chain is very apt. As with a physical chain, a cold chain is only as strong as its weakest link. People are a critical element of a cold chain, and they need to correctly execute procedures and take appropriate actions in the event of a problem. Beyond the people directly involved in the cold chain are those who design shipping containers and develop monitoring devices to track the temperatures that the pharmaceuticals are exposed to. All need to have the appropriate knowledge and skills so they can perform their jobs.

Because of its international scope and work in the area of vaccines, the World Health Organization’s Global Training Network for Vaccine Management (now called Vaccine Quality Global Learning Opportunities [GLO]) recognized the need to develop the knowledge and skills of those involved in the pharmaceutical and vaccine cold chain. GLO developed a unique training course, Pharmaceutical Cold Chain Management on Wheels (PCCMoW), that takes 15 carefully selected participants on a bus trip in Turkey where they can make direct observations at the storage, warehousing, distribution and health care facilities that they visit as they physically travel with mentors by bus down the length of the cold chain. Throughout the course, guided observation exercises take place at the visited facilities. Participants are provided with notes and tools to support their critical observations, and they interact with operational staff and management at these facilities. Presentations and group discussions take place on the bus, in restaurants, and in the open air before and after the visits to the facilities.

Turkey was selected as the course venue, in part, because of the cultural practice of hospitality, the availability of a complete cold chain operation within a relatively short distance, and the availability of a local tour coordinator who arranged the logistics and helped with the extensive planning required (WHO, 2005, 2008). While some of the participants would not consider themselves public health professionals, their contribution to the transportation system, monitoring devices, and cooling equipment is essential for successful vaccination and health maintenance efforts.

Approximately 75 people (as of June 2011) have participated in the PCCMoW course, a very small number compared to the tens of thousands of people world-wide who could benefit from gaining expertise in this field. This, then, forms the challenge: to develop an alternative learning opportunity to meet this need.

Considering the community of learners

In the PCCMoW course, being in close physical proximity for a week – sharing meals, bus rides, projects, tours – contributes to a unique community of learners who would cooperate and collaborate and in many cases, develop personal and professional relationships that extend beyond the course itself. At the outset, the WHO course director wanted an e-learning course that would result in similar outcomes achieved in the physical course. It was this goal or “functional requirement” that led an examination of some of the underlying principles of community of learners.

Using a design research method

The overall method used in this study is educational design research. Educational design research (also referred to as *design-based research*, *design experiments*, and other names) (van den Akker, Gravemeijer, McKenney, & Nieveen, 2006) is recommended because it:

- Focuses on broad-based complex educational problems
- Requires collaboration between researchers and those directly involved with the problem of interest
- Integrates known and hypothetical design principles and technology in achieving a solution
- Utilizes rigorous and reflective inquiry to test and refine innovative learning designs and identify new design principles
- Involves improvement of the design through evaluation
- Contributes to both theoretical understanding while solving real world problems (Herrington, Reeves, & Oliver, 2010, p. 176).

Reeves (2006) presented a design-based research model consisting of four phases (Figure 1).

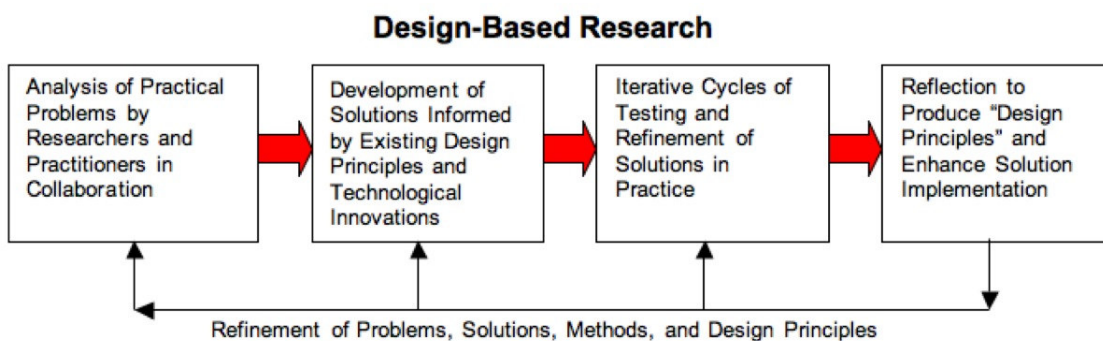


Figure 1: Four-phased design-based research model (Reeves, 2006, p. 59).

The work described in this paper is an output of the second phase of design-based research, that is, “Development of solutions informed by existing design principles and technological innovations”.

An initial set of draft design principles

Based on an extensive review of the literature (some of it summarized earlier in this paper), a set of draft design principles were developed (see Table 1) that are being used to guide the design and implementation of a virtual, e-learning version of the PCCMoW course. Throughout the research, these design principles will be refined and enhanced. As Table 1 shows, the draft design principles are broad-based statements from which more concrete actions, design features, or opportunities can be derived and will be used in the e-learning program.

Table 1. Initial Design Principles to be used in the e-learning solution

| Community of learners: An interdependent set of individuals that cooperates and collaborates as they conduct research, share outcomes, and perform a meaningful task. | | | |
|--|--|--|--|
| No. | Draft Design Principle | Meaning | How this will be used |
| 1 | Utilize instructional and visual designs that support and are sensitive to multicultural learners who bring different learning and reasoning styles along with different communication, language, technological, and problem solving skills. | The underlying instructional design of the learning solution is the foundation on which the course is developed and implemented. When making design decisions, the underlying question needs to be how learners from other, particularly non-European, non-North American cultures might view the content or activity. | <ul style="list-style-type: none"> • Have meaningful content that reflects real-life outcomes and situations. • Use inclusive design principles for information that assumes non-native English speakers. • Use a mixture of synchronous and asynchronous activities/events. • Size teams with 3-4 people per team. • Have clear instructions for each activity. • Develop and have learners use an online diary that the facilitator/instructor can monitor to provide direct, unique feedback. • Use graphics, illustrations, icons, etc. that are not culturally inappropriate in a multi-cultural environment. |
| 2 | Create safe structured and unstructured opportunities, methods, and tools for learners to meet, develop relationships, and actively collaborate with each other. | Learners will participate and contribute to the community if the right conditions are present. This includes helping learners get to know one another and develop some knowledge about the other learner's "context" and points of view. | <ul style="list-style-type: none"> • Create initial icebreakers so people can meet others in their C of L. • Provide different modes of communication that learners and facilitators can use (e.g., real time chat, email, postings). • Provide a "profile" page where learners can post information about themselves and as much of their personal and professional lives as they are comfortable in doing. • Limit the situations or technical options where someone might unwittingly embarrass someone from a different culture. • Create an activity or event so all participants can value peer-to-peer feedback and learning. • Minimize changing or mixing of small group members. |
| 3 | Select and develop technology that is appropriate to the learners, their location, available infra-structure, and culture, and that supports multiple "channels" for communication. | The underlying technology used for the e-learning program should be able to be used without problems by the intended users. The affordances that the technology provides should contribute to the goals and objectives of the course and the valid expectations of the users, facilitators/instructors, and sponsors. | <ul style="list-style-type: none"> • Identify minimum technological standards (hardware, communication, applications, etc.) that are as broad-based as possible. • Match the information technology and learning technology with learning theories. • Keep the technology as simple as possible. • Use technological tools that will contribute to higher amounts of social presence. |
| 4 | Identify and communicate learner roles and responsibilities that set the expectations for the learners. | When potential learners are inquiring about the course, they should be provided not only with course goals, objectives, topical outline and responsibilities, but also with information to help them decide if they are a good candidate for this type of e-learning program. | <ul style="list-style-type: none"> • Develop a questionnaire to help potential learners decide if they have the characteristics and learning styles needed for success in the course. • Set expectations about reading, thinking about /reflecting, and responding to postings and assignments. • Identify ways that learners can request additional support from peers and facilitators. • Provide learners a "roadmap" of the course and what is included. |

| No. | Draft Design Principle | Meaning | How this will be used |
|-----|---|--|--|
| 5 | Identify and communicate facilitator / instructor roles and responsibilities that provide the expectations and guidance for the course leaders. | Facilitators, instructors, and mentors are critical for maximizing the flow of correct information and knowledge sharing as well as monitoring and guiding individuals and group dynamics. For many instructors and mentors, facilitating a virtual e-learning solution is a new experience; having guidance to help them succeed is needed. | <ul style="list-style-type: none"> Establish guidelines that cover: providing timely feedback, supporting peer learning, monitoring learner comments and diary entries to guide individuals and groups to deeper levels of discussions, and providing affective support. Provide culturally-informed guidance on ways people may respond or not respond. Provide guidance on “faders” who may be withdrawing from active participation. |

Incorporating design principles into the learning solution

Specific ideas identified in Table 1 were used by the developers in initial prototypes. For example, Figure 2 shows a sketch of an initial icebreaker activity, “Two truths and one lie” which aims to instantiate Draft Design Principle #2, *Create safe structured and unstructured opportunities, methods, and tools for learners to meet, develop relationships, and actively collaborate with each other.*

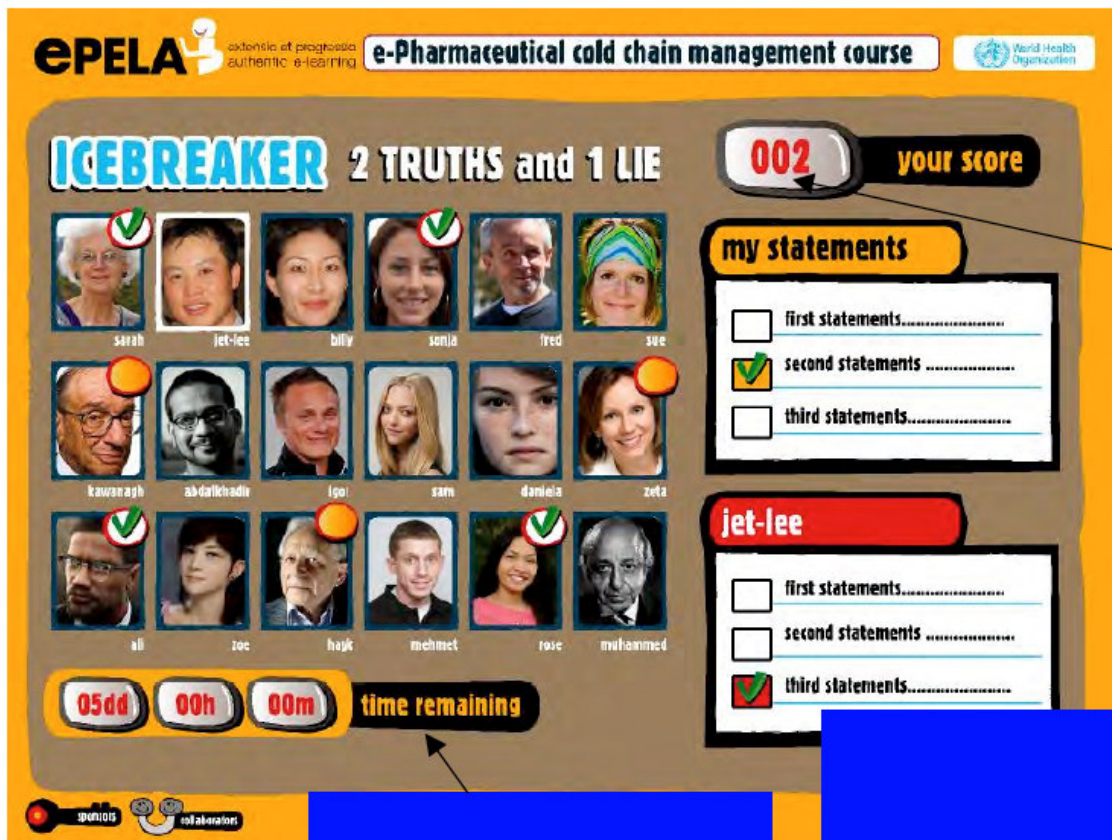


Figure 2. Example of a screen used as icebreaker to be used in the e-learning course.

Other ideas that will be incorporated include learner and instructor “profile” pages and ways that all participants can upload personal information that may be of interest to the group – another example of how Draft Design Principle #2 will be incorporated. Draft Design Principles #4, *Identify and communicate learner roles and responsibilities that set the expectations for the learners* and #5 *Identify and communicate facilitator / instructor roles and responsibilities that provide the expectations and guidance for the course leaders* will be accomplished by developing and communicating guidance as to what would be appropriate/not be appropriate with all participants.

Use of formative evaluation

As shown in Figure 1, the design-based research model incorporates evaluation, specifically in multiple iterations done in different ways at different times. For this research project, one round of formative evaluation (Reeves & Hedberg, 2003) performed by expert visual designer and instructional designers has been completed (Vesper, Reeves, & Herrington, 2011). In the next rounds of formative evaluation, potential users and actual participants will be asked about the e-learning course (including the use of groups and the facilitators/instructors) and how all the elements contributed to or impeded the development and functioning of the community of learners.

Conclusion

In a physical or virtual learning situation, participants form groups – communities of learners – to cooperate and collaboratively accomplish a task or activity that contributes to their learning. As we have seen, there are many factors that can support or detract from that community. In creating a specific e-learning course, the designers, developers, and researchers are looking at ways to promote this community and, through evaluation at key points during the e-learning course's development, identify and confirm design principles that can be used in future e-learning projects.

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