

Start Talking in an e-Learning Environment: Building and Sustaining Communities of Practice

Melissa C. LaDuke

Abstract—The purpose of this targeted analysis was to identify the use of online communities of practice (CoP) within e-learning environments as a method to build social interaction and student-centered educational experiences. A literature review was conducted to survey and collect scholarly thoughts concerning CoPs from a variety of sources. Data collected included best practices, ties to educational theories, and examples of online CoPs. Social interaction has been identified as a critical piece of the learning infrastructure, specifically for adult learners. CoPs are an effective way to help students connect to each other and the material of interest. The use of CoPs falls in line with many educational theories, including situated learning theory, social constructivism, connectivism, adult learning theory, and motivation. New literacies such as social media and gamification can help increase social interaction in online environments and provide methods to host CoPs. Steps to build and sustain a CoP were discussed in addition to CoP considerations and best practices.

Keywords—Community of practice, knowledge sharing, social interaction, online course design, new literacies.

I. INTRODUCTION

THE size and necessity of the distance learning market has grown despite issues with distance learning development and implementation [1]. In distance learning's current state, only four percent of learners who begin an online course finish [2]. Social isolation and low motivation are two main reasons for the low completion rate [3]. However, nurturing and maintaining connections is necessary to facilitate continuous learning especially in an online environment [4]. As John Dewey stated, "Education's goal should be stimulation for inquiry and process of knowledge getting, not memorizing a body of knowledge" [2]. One way to improve the educational experience of online learners is through increased student interaction [5].

CoPs are a way to increase student engagement while growing self-directed learners. CoPs support various learning theories such as situated learning, social constructivism, connectivism, adult learning, and motivation. CoPs allow students to take part in legitimate peripheral participation that allows students to take knowledge gained and apply it to different situations. This paper will address what a CoP is, educational theories in support of CoPs, steps to establish a CoP, and best practices and considerations. Educators can learn how to establish CoP using transformational social interactions through new literacies best practices. Overall, creating self-directed learners using social interaction helps

M. C. LaDuke is with National Intelligence University, Bethesda MD 20816 USA (phone: 808-383-3558; e-mail: mci1783@yahoo.com).

students become adult learners [6].

II. DEFINING FEATURES OF A COMMUNITY OF PRACTICE

The foundation of a CoP is people "who share a concern or a passion for something they do and learn how to do it better as they interact regularly" [7]. A CoP is defined by three features: the domain or area of interest, the community used to share information, and the practice of sharing information [7]. The domain of interest implies that the members of the community are dedicated to sharing their expertise in the given topic [7]. The members of the CoP acknowledge that they can learn from each other [7]. Second, the community is built by members helping each other and establishing relationships through joint activities [7]. Merely sharing the same duties or same titles does not create a community [7]. However, a CoP is created if individuals in the same positions share information in a meaningful way [7]. One example of this is impressionist painters who met to discuss the style of art they were inventing [7]. Lastly, the practice of sharing information means CoP members develop their own reoccurring methods to discuss problems and issues [7]. Developing these interactions takes time and sustained effort but does not mandate the use of formal exchanges [7]. For instance, colleagues sharing stories over regularly-held lunches that impacts their individual actions in their job is an example of a sustained practice [7].

III. EDUCATIONAL THEORIES

A. Situated Learning Theory

Situated learning theory emphasizes that students are more willing to learn if they are allowed to be active participants in the process [8]. Situated learning theorists Lave and Wenger [9] believed that learning happened through CoP, which urge students to be involved in their own learning. They [9] developed this theory through their own exploration of various communities such as recovering alcoholics, butchers, midwives, and tailors. Their examination of the types of social interactions that are best for learning found environments engaging in social mediation gave learners the opportunity to practice with experts, while having limited responsibility for the entire product [9]. The foundation of situated learning theory is that skills learned by students are not transferrable if learned in a specific context [10]. Clancey [8] asserted, "Learning is a process of conceiving an activity ... [which] puts emphasis on improving learning addressing issues of membership, participation in a community, and identity" (p.50). Situated learning may take place through CoP in which

learners bond their desires to learn from and teach each other [11].

B. Social Constructivism

Social constructivism is founded on the idea that one's social environment influences one's learning [12]. Students become part of a given learning culture based on interactions with their learning environment and their prior knowledge [13]. Participation of the student and others is vital to the construction of knowledge [14]. Constructing knowledge within a community of learners may build a stronger knowledge foundation, which helps students gain competence in a subject [14]. The act of connecting of one person to another who may be more knowledgeable on a subject helps create higher mental processes [15]. In an online environment, the pedagogical methods and tools used to aid connections made among learners develop "a sociotechnical frame or set of creative constraints within which contemporary social constructivist activities occur" [15]. Applying social constructivist ideas to a CoP may help determine if students are identifying with their learning community and if the learning by each student is "situation-specific and context-bound activit[ies]" [13].

C. Connectivism

Connectivism was spawned by Siemens [4] from the rise of the digital age. Students may not be able to physically involve themselves in a phenomenon but may be able to learn from connecting to it through other people's experiences [16]. Connectivism states new information is continually being taken in by individuals who then determine what is important and what is not [4]. Connectivism relies on eight principles that focus on people sharing accurate and current information with connections between a diverse set of opinions, ideas, fields, and concepts [4]. People use both decision-making processes and technology to grow their capacity to learn more than they already know and maintain connections [4]. The ultimate goal is continuous learning among participants [4]. It is important to note the changes in the climate surrounding a person's decision-making process may cause a "right" answer today to be "wrong" tomorrow [4].

Online CoPs closely tie to many connectivist principles. Participatory practices seen in many online environments foster informal learning environments for both performers and the audience which tie to connectivist Principles 3 ("Learning may reside in non-human appliances") and 1 ("Learning and knowledge rests in diversity of opinions") [17], [4]. Instituting participatory course design approaches necessary for CoP development and sustainment call for increased consideration on the learning tool being designed which applies to connectivist Principle 3 [18], [4]. Shifting to practices that make the user integral in their learning aids in meeting tacit and latent knowledge needs [18]. This accounts for unspoken learning needs now and in the future which is part of connectivist Principle 5, "Nurturing and maintaining connections is needed to facilitate continual learning" [4]. Lastly, the action of connecting with others, as done in CoPs,

is tied to connectivist Principle 2, "Learning is a process of connecting specialized nodes or information sources" [4].

D. Adult Learning

Adult learners have very specific educational needs that may also be addressed using CoPs. To help educators understand the needs of adult learners, Knowles [19] coined the term andragogy, which is founded on six assumptions:

1. Teachers have a responsibility to help adults in the normal movement from dependency toward increasing self-directedness.
2. Adults have an ever-increasing reservoir of experience that is a rich resource for learning.
3. People are ready to learn something when it will help them to cope with real-life tasks or problems.
4. Learners see education as a means to develop increased competence.
5. Adults need to know the reason to learn something.
6. The most potent motivators for adult learning are internal, such as self-esteem. [6]

Hansman [11] used her university experiences to determine how adults benefitted from context-based learning that incorporates social aspects. Hansman [11] further argued adult learning relies on the tools and the learning setting as the student's interaction with both helps shape his or her cognitive processes. Pairing social learning with the student's environment outside of school allows the student to apply classroom knowledge to real-world situations [11]. This type of learning may occur through CoPs, in which learners bond their desires to learn from and teach each other [11]. Learners in these environments may be fueled by a learner's responsibility to help others [6].

E. Motivation

Motivation is a strong driver of community building within an online environment. Interaction is a vital part of the effectiveness of an online learning program due to students' need to create and develop knowledge with others [20]. Some students may prefer interacting in an online community because of the trust gained and interdependence established in well-designed e-learning activities [21]. As the foundation of the learning experience is interaction with others, students are more motivated to learn and learn from others when interactions are community based [22], [20]. CoPs foster supportive interactions that aid students in learning the material and developing critical thinking skills [23]. As student motivation increases, so does student performance [23].

IV. BRIDGING THE CONTEXTUAL LEARNING GAP

A. Legitimate Peripheral Participation

Learners can transition skills learned in the classroom into real-world practices through legitimate peripheral participation. Legitimate peripheral participation, a key facet in situated learning theory, requires learners to "know," which mandates action that may manifest itself through self-talk and social mediation [9], [24]. CoP members must talk within the

practice not about the practice in order to transition from apprentice to expert [9], [24]. Talking within the practice includes using same terminology as experts in the given field and participating in authentic activities while engaging with fellow learners [24].

Teaching skills in an online environment without giving them context implies the knowledge is self-contained [10]. This method of teaching can hinder students' application of classroom skills to similar situations encountered in real life [10]. Ormrod [25] wrote, "Transfer is more common when information and skills are perceived as context-free rather than context-bound" (p.281). Anderson et al. [26] summed up the thoughts of Brown et al. [10] and Ormrod [25] by stating, "Training by abstraction is of little use" (p.5).

B. Community of Inquiry

A community of inquiry (CoI) may be the necessary tool to help learners who feel they do not have the requisite knowledge transition to be active participants in a peer-run commune. Within an CoI, the instructor is the facilitator for the formation of the knowledge required for the group to become a CoP [27]. Much like a CoP, CoIs have three pillars: social presence, cognitive presence, and teaching presence [28]. Social presence is "the ability to project one's self and establish personal and purposeful relationships" and relates to the community feature of a CoP [28], [7]. The cognitive presence is pillar that supports student collaboration and self-reflection through "the exploration, construction, resolution, and confirmation of understanding" [28]. Cognitive presence in CoIs is much like the domain and practice portions of a CoP [7]. The last CoI pillar is teaching presence which includes the design of instructional and collaborative activities, facilitation of actions, and direct instruction [28]. Good facilitation and instruction coupled with engaging and collaborative learning activities helps grow students' abilities to learn from others and own their learning processes [29]. Once students have taken ownership of their learning and collaborative processes, the teacher can remove him/herself and allow the CoI to transform to a CoP [27]. Fig. 1 compares key components of CoIs and CoPs.

Community of Practice	Community of Inquiry
Student perspective/centered	Instructor perspective/centered
Peer-to-peer collaboration	Peer-to-peer and peer-to-instructor interaction
Three pillars: the domain, the community, and the practice	Three types of presence: social, cognitive, and teaching
Driven by willingness of members	Emphasis on teacher interaction with students/group
Designed to share knowledge, develop expertise, and/or solve problems	Created to encourage higher order cognitive processes, engagement, and deep learning
Focused on learning and building capacity	Designed to define, describe, and measure the development of online learning communities
Natural life cycle	Varying life cycles
Relies on relevance, excitement, and value to attract and engage members	Relies on well-designed learning activities and connection with the instructor and other learners

Fig. 1 Highlights of CoIs and CoPs

V. CoPs, NEW LITERACIES, AND ONLINE INTERACTION

A. Overview

Bouhnik and Marcus highlight that various studies show that reinforcing the most beneficial part of an online course is the "interaction factor" [1]. Wegerif [30] found the more students interacted with the course and each other, the more the asynchronous environment felt like a community. Students reported the increased time for reflection on peers' discussion posts allowed them to become more creative and better connect material [30]. Other students felt more comfortable having open discussions in the online environment as gender biases experienced in face-to-face interactions were not present [30]. However, the online course construct presented by Wegerif [30] was not without areas for improvement. Some students found, while they were able to engage in legitimate peripheral participation through discussion, more assignments based on argumentation would lead students through more critically challenging thought processes [30]. Additionally, the reliance on only one type of interaction (written) did not allow for those who learned through other means (visual or audio) to fully learn from all students [30]. However, Wegerif's [30] study can be used to address the lack of meaningful student-student and student-teacher interaction within an online learning environment [31]. Problems identified in Wegerif's [30] could be addressed by the use of new literacies, specifically in terms of establishing CoPs in an online environment.

As stated by Knobel and Lankshear [32], "New literacies are more participatory, collaborative, and distributed . . . than conventional literacies" (p.98). Active engagement in new literacies requires much more participation on the parts of the student and teacher [32]. Participation comes in the form of sharing expertise and resources, collaboration and interactivity with others, and providing feedback and support through a variety of daily practices [32]. Active participation in new literacies may often develop advanced synthesis and analysis skills not required in typical classrooms [32]. These traits mirror those needed for the establishment and sustainment of CoPs and the benefits gained by students.

When discussing new literacies and the participatory experience, it is important to define digital literacy and media literacy. Digital literacy is the ability to use technology, which is the focus on user-centered interfaces [18]. Media literacy is the ability to use digital literacy to aid learning through the sharing of materials and ideas [33]. New literacies use both digital and media literacies to further the learning experience for the user, who is now part of the learning team [33]. As technology continues to change, educators need to "rethink their basic tenets, to deploy the new technologies in creative and productive ways, and to restructure schooling to respond constructively and progressively to the technological and social changes that we are now experiencing" [34]. Teaching how technology may be used (i.e., digital literacy practices) does not by itself improve participatory practices [34]. However, a sound foundation on digital literacy is needed to move into participatory experiences within new literacies [34].

Employing new literacies is not meant to be the single solution to engaging all students [17]. The practice is meant to grow the creativity and participation needed to function in a Web 2.0 world [17]. While there are many new literacies tools that can be used within a CoP, two distinct options, gamification, and social media, are discussed below. In order to gain a common understanding, key terminology will need to be defined.

B. Gamification

Within adult learning communities, gamification can be a strong tool to build a CoP. Shi et al. [35] conducted a mixed methods study using the responses of 15 students who participated in a course using Topolor. Topolor can be described as “a social personalized adaptive e-learning system, which aims at improving fine-grained social interaction in the learning process in addition to applying classical adaptation based on user modeling” [36]. Shi et al. [35] used Topolor to create a course with structured topics that use long-term, medium-term, and long-term goals to reach learning objectives. The structure allows students to pick which topics to learn as long as they accomplish short-term goals before medium- or long-term ones [35]. The 15 surveyed students reported higher levels of satisfaction with respect to student autonomy, topic competence, and relatedness with other students [35]. This type of gamification also allowed students to stay independent with individual tasks while creating a community of peers that shared resources and discussed presented information [35].

C. Social Media

Social media in its various forms has also become a prime method for developing and managing CoPs. Annabi and McGann [37] argue the use of social media is the link between CoPs and real-world activities. The rapid sharing of information the use of social media provides has already been embraced by professional communities [37]. Social media is vital to knowledge sharing and management due to its collaborative nature, the ability for users to aggregate and share knowledge, and ease of navigation through the network based on shared interest [37]. One specific example of social media use within CoPs is Lewis and Rush’s [38] study on the use of Twitter as the foundation for a CoP. As one of the goals of Twitter is to have users follow each other, users tend to follow accounts that have similar interests [38]. Users can also become a part of a clique in which accounts are interconnected by other accounts in the same network [38]. Within these interconnected nodes, sharing of information occurs through the use of hashtags, user mentions, and website references [38]. Lewis and Rush [38] found that while Twitter was not specifically built for CoP activities, internal and useful communities exist based on the goal of sharing desired information. While there is still argument if social media and other new literacies constitute Lave and Wenger’s [9] definition of CoPs, researchers may agree the participatory practices seen in new literacies foster informal learning environments for both performers and the audience [17]. In

this way, social media and other new literacies meet the intent of the domain, community, and practice features of CoPs.

VI. METHODS TO BUILD AND SUSTAIN A COP

There are six general steps to build and sustain a CoP. The first one is to link people who have similar practices and interests. The CoP author should explore potential participants to identify the “audience, purpose, goals, and vision for the community” [39]. During this phase, the CoP creator should conduct interviews, hold discussions, and facilitate focus groups to gather information [39]. Outputs from this phase include the team’s mission and vision statements and the major issues to be examined. At this point, core members of the CoP that represent the larger community should be identified [39]. These core members will help in the development of the CoP prototype prior to its use by all members [39].

Next, the CoP author needs to design the community infrastructure to help the CoP members meet their goals [39]. In this stage, the CoP author needs to design in a variety of methods to sustain student interaction/discussion [7]. This includes creating collaborative activities that allow members to share their ideas while generating energy to complete necessary tasks [39]. The CoP designer should also work to determine how students will collaborate and define roles within the community [39]. Outputs for the design phase include a tasks list for members and a schedule for meeting and community development [39]. The CoP designer should also provide a shared repository of information sources members can use to further their knowledge on the chosen subject and add to as the CoP progresses [40].

The third step is to test the community in its current state [39]. It is in this step the tools that will be used by the group are tested for suitability [39]. The CoP designer should take into account the needs and skill level of the participants. This may mean using tools participants already understand [40]. One example of this is Barczyk and Duncan’s [41] study on ways Facebook was used in university courses through building a classroom community. The test phase can also help the CoP designer and team members determine the tone the CoP should have and how success will be measured [39]. The main product of this phase is feedback on the CoP construct and how the CoP members interact with each other [39]. The feedback should then be used to modify the CoP as necessary before it is launched into the bigger community [39].

The fourth step is to launch the CoP to a wider audience [39]. The CoP core group as well as the CoP designer should recruit new members using the benefits of joining the community as enticement [39]. The existing members should educate new members on community norms, engagement, battle rhythm, and how success will be measured [39]. In the launch stage, the CoP members should draft the community charter that defines the agreed-upon mission, vision, team goals, and other items deemed important [39]. Core members should also provide orientation to new members to include used communication channels and synchronous and asynchronous activities [39].

Once the CoP is launched, the most critical phase to determine sustained success of the CoP is the growth stage [39]. In this phase, the activities from the previous phases need to continue in order for CoP benefits to be documented and areas for improvement identified [39]. New and old CoP members should create their own identities and presence within the group [39]. The efforts of members of the CoP should be recognized and other products that may help members reach team goals need to be identified [39]. The CoP designer will be required to collect data from members to determine the effectiveness of the CoP through more focus groups, interviews and surveys [39]. Facilitated discussions on the CoP itself that identify the culture, processes and practices, motivation of members, and future opportunities must occur and be documented [39]. Without the opportunity and active effort to grow, the CoP may end without members meeting their learning goals [39].

The last step in the CoP process is sustainment [39]. It is in this step current CoP members reflect on activities and processes that lead to dynamic and engaged participation [39]. Constant assessment on if/how the community is serving its purpose is needed to determine if the CoP still has value to its members [39]. The CoP designer and members need to review its audience and be cognizant of any shifts in group expectations or needs [39]. If the CoP has reached the end of its usefulness, it may dissolve or shift into studying a different topic.

VII. CONSIDERATIONS AND BEST PRACTICES

Members of online CoPs still need a fair amount of discipline to find the community helpful and engaging [30]. If a student does not regularly take part in community activities, the amount of missing information can feel overwhelming leading to less active participation [30]. Additionally, if new community members are not sure how to engage with the online tools and/or the community, they may collaborate less and not easily move into legitimate peripheral participation [30]. This can be mitigated through moderation from the instructor and/or CoP owner [30]. Practitioners and designers of CoPs need to look for ways to draw out the implicit knowledge of members of the community to be shared in meaningful ways [42]. Doing this will help transition CoP members from knowing “about” to knowing “how” [42].

Regardless of the specific tools used for online CoP development, experts can agree on seven best practices. These practices have been discussed throughout this reading and are summarized below:

- Design [the CoP] for evolutions in environment and needs
- Create a space that is inclusive for constructive conversations between inside and outside perspectives
- Welcome and celebrate varying levels of participation
- Cultivate private community spaces and public forums that can be used to gather new members
- Focus on the value of the CoP for members
- Intertwine enthusiasm for something new with the comfort of familiarity
- Create a dynamic yet balanced rhythm for community

members [43]

Also, Duguid [42] cautioned against “learning about.” As the purpose of a CoP is to move participants from apprentices to experts, the knowledge gained should relate to the “how” of a subject [42]. Learning the “about” of a topic leads participants to be able to talk about a topic but not engage in the topic in a meaningful way [42]. Talking “about” a topic can be due to difficulties members of a community may have in sharing their inherent or tacit knowledge [42].

VIII. CONCLUSION

While “no single approach to subject matter, teaching, or resource allocation is adequate for all students,” it is important to discuss how to appeal to a variety of learners while allowing them to take control of their learning online [44]. CoPs are a powerful tool within the online educational environment. The construct allows for student-centered education to occur and gives students the opportunity to own their learning. The use of CoPs provides students opportunities to engage in legitimate peripheral participation, tying abstract concepts to real-world practices as prescribed in situated learning theory. CoPs appeal to student motivation and key adult learning principles by giving students the chance to study a topic deemed important to them. Instructors who choose to use CoPs in their educational practices should build in engaging activities to help students initially connect in the material. For online CoPs, new literacies considerations can help guide CoP designers on which tools to choose and how they should be used based on connectivist and social constructivist principles.

Whatever the methods chosen to build and sustain an online CoP, it is critical to consider the needs and abilities of the learner [1]. This includes accounting for the instructional interface as well as the activities chosen to build the learning community [1]. The CoP needs to be treated as a living entity; nurturing it through all six stages of growth and sustainment ensures its effectiveness in connecting students with each other and desired material. With careful reflection and targeted improvement, CoPs can be the link to developing lifelong learners.

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Melissa C. LaDuke earned her PhD in curriculum and instruction from Texas Tech University in Lubbock, Texas, USA. Prior to that, Dr. LaDuke completed her bachelor’s degree in chemistry from Hawaii Pacific University, Honolulu, HI, USA and Master’s degree in chemistry from University of Dayton, Dayton, OH, USA.

She currently serves as a faculty member at National Intelligence University in Bethesda, MD, USA. She has been in the U.S. Air Force since 2005 and held instructor and faculty positions within the U.S. Air Force Academy, U.S. Air Force Reserve Officer Training Corps, Global School for Professional Military Education, and Squadron Officer School. Her research interests include adult education, teacher education, and online education.

Dr. LaDuke is a member of the Literary Research Association and Institute of Electrical and Electronics Engineers. Dr. LaDuke also chairs the Inclusion and Equity Committee for the American Association of University Women.