Fostering Online Communities of Practice in Vocational Education

LESLEY S. J. FARMER,
Department of Advanced Studies in Education and Counseling
California State University Long Beach, USA
lfarmer@csulb.edu

Abstract: Career and vocational education (CVE) should represent an efficient way to facilitate the growth of the learning community as a whole. The term “community of practice” provides a useful context for pre- and in-service professional development. The need to incorporate the features of a community of practice (CoP) in CVE becomes increasingly apparent as this work philosophy permeates the professional workplace. Particularly as web 2.0 tools facilitate collaboration, online CoPs can thrive. Not only do students engaged more actively in their learning, but they gain from multiple perspectives, and can develop more complex projects with the help of others. For online CoPs to succeed, CV educators need to design instruction that helps students get to know each other, and collaborate. Technological tools can facilitate such interaction, overcoming time and space issues. CoPs not only provide authentic training opportunities, but can also link professionals.

Keywords: careers, vocational education, communities of practice, e-learning, instructional design, knowledge management

1 Introduction

Career and vocational education (CVE) should represent an efficient way to facilitate the growth of the learning community as a whole. The term “community of practice” provides a useful context for pre- and in-service professional development.

Communities of practice constitute an effective way to optimize learning and application in the field. By working with others, students gain new perspectives and can test their own knowledge on their peers. Students can accomplish tasks together that would be too large and complex, or demand specific skills that might be unknown to an individual but familiar to another. Because they are working as a community, students may call upon each other for help – and can raise the bar for achievement as positive social norms encourage friendly academic competition.

In using a community of practice (CoP) model when designing instruction, CV educators need to establish a learning environment that integrates collaborative learning and practice. They need to provide access and motivation, resources, learning activities, and social opportunities. The instructor assumes the role of a coach rather than a sage, providing just-in-time guidance and intervening when students are off-track or dysfunctional.

As CVE students increasingly learn at a distance using technology, the form of a community of practice changes shape to some degree. Missing face-to-face interaction, some students may feel isolated. Particularly as much telecommunications is asynchronous and text-based, learners may feel sense-deprived. Therefore, career and vocational educators need to find ways to foster online communities of practice in order to optimize learning and application of knowledge to real workplaces.

2 Background

Basically, a community of practice consists of a group of people with common values and goals. In the business world, a community of practice could include a work unit, mid-level management, or even the entire enterprise. In most cases a community of practice has a social dimension that fosters interdependence, but the chief goal is organizational improvement through individual and group professional development and deployment.

In education, the term “community of learners” is more likely to be encountered. As with a community of practice, a community of learners develops interdependent relationships as they learn from each other. Carney defines a community of learners as “a place were student learners are made to feel that their prior knowledge, the knowledge that they are acquiring, and the skills that they are learning to acquire future knowledge are all tied together” [1]

In both kinds of communities, the notion of sustainability, or at least ongoing engagement is expected. In a community of practice, it is more likely that a broader spectrum of experience and expertise will be represented, if for no other reason that entry-level employees may be incoming members and long-term employees may serve as
mentors. However, just as a curriculum is greater than a course, so too are students on VCE programs likely to include neophytes and veteran learners. In both cases, a social norm exists that fosters and facilitates the sharing and generation of information. Indeed, “knowledge management” is a related activity whereby the individual knowledge of a group or organization is systemically collected, organized, and stored for effective retrieval and use by the whole enterprise.

It might be said that a community of learners might have more prescriptive outcomes and available resources, although a case may be made that a community of practice might have very specific goals in mind. Likewise, it might be assumed that a community of learners has as its first goal individual achievement, unlike a community of practitioners that also strive for organizational achievement. Nonetheless, in CVE, a blending of a community of learners and practitioners is a valid approach since the profession as a whole should benefit from the training being offered to a specific population. Because CVE includes both pre- and in-service professional development, the term “community of practice” offers a more robust and valid perspective.

2.1 Learning Theory

Adult learning theory posits that adult learners bring a host of experiences and expertise to formal education. They want to learn upon need and then apply it directly. They tend to be self-directive, yet want their social needs met as well as their academic ones [2]. For these reasons, a CoP model has the potential to work well with this population.

Online education can be very appealing to this population because of its convenience and potential for self-pacing. Adults who prefer online learning tend to be independent, prefer anonymity, value egalitarian, and work outside the 9-5 timeframe. They are comfortable with complex, ill-defined academic domain, and may have physical or language challenges [3]. On the other hand, some adult learners are not comfortable with technology, and may feel particularly isolated in an online learning environment.

Collaborative learning constitutes another feature of CoPs. This learning strategy involves small groups working together towards a common goal or solution. Other features of collaborative learning include group and individual accountability, distributed leadership, and group autonomy. Vygotsky emphasized the social aspect of learning, asserting that learning exerts first between people and then is internalized. Collaboration provides opportunities for learners to think aloud and engage both intellectually and emotionally, and incorporates both academic and social objectives [4].

2.2 Instructional Design

An online CoP environment differs from a face-to-face setting in several ways. Students are more responsible for their learning, and are more likely to connect at their convenience rather than at a set time and place. Content focuses more on resource-based learning and on process, and the instructor serves more as a learning environment planner than as a sage lecturer. Building on an overarching constructivist paradigm, the theories of situated and functional contextualized learning inform the design of a web-based CoP that provides professional contact, illumination of national standards for excellence and accountability, modeling and coaching for CV students, and a repository of objects and artifacts for teaching and learning. Situated learning provides the learner with a type of provisional membership into a CoP as she/he learns the language, rules, customs, and culture of that community. When the community exists not in physical presence, but online, these supportive, mentoring relationships can happen in the form of discussion boards and chats, and through individual reflection and encouragement. These theories stress the importance of learning new information in an environment which builds on existing knowledge, incorporates new materials and equipment which will be used by the learner in the learning environment and afterwards, allows for transfer of the learning to professional experiences, and requires interaction and collaboration. Instructional design within the framework of CVE and CoP tries to take advantage of the expertise within that community, as well as the established practice.

In particular, instructional design should foster a sense of belonging so that newcomers and less experienced students feel comfortable asking for help and learning alongside more experienced peers. Instructional design also recognizes that the CoP needs to transcend the curriculum if it is to grow, so the program structure itself needs to link to outside sources of information. Instructional design also helps the CoP construct a collective meaning and facilitate that new knowledge into new practice through peer support and recognition. Underlying the entire process within a CoP, instructional design needs to provide opportunities for self and community reflection on learning. Indeed, that self-reflective process enables the community as a whole to identify current best practice and areas for improvement. Thus, the community acts as a system for continued and regulated change.
2.3 Real-World Connections

Increasingly, businesses are using online CoPs to inform their employees and their constituents, and to remain fiscally and developmentally competitive. For instance, consumers who use community services purchase more online than the average web shopper; when people have a chance to share their experiences, ideas and concerns, they develop more of a bond with the service. Farmbid.com gives over 100,000 users access to industrial services along with farming advice; they also provide real-time chat and online auctioning (Barth, 2000).

Likewise, companies are using online collaborative tools to develop a greater sense of loyalty, particularly among millennial employees. Two factors serve as catalysts in online CoP development: globalization (and other distance issues) and knowledge management. In both cases, the issue of intellectual capital is central. How will new employees learn the trade and the corporate culture? As employees move from one job to another more often – or retire, corporate information, much of it proprietary, may leave with them. Therefore, procedures and best practice need to be documented and shared in order to speed up newcomers and to keep relevant areas of the enterprise informed; organized and accessible databases of information and resources, the cornerstone of knowledge management, can mean the difference between profit and bankruptcy. A CoP approach to corporations also reflects the philosophy of participatory management, and resonates with younger employees who want to contribute to the organization from the start [5].

These online CoP skills and practices can be learned before entering the job market. CVE is well positioned to introduce these ideas to pre-service trainees, who can hone their skills and be more prepared – and more employable – in their chosen fields. Furthermore, CVE can partner with business CoPs to facilitate the transition from pre-service to in-service professional development.

3 Issues

According to Shannon, the most effective education melds active engagement, project-based learning, attention to individual needs, technology, and authentic assessment. Forging and sustaining an effective online community of practice (CoP) in CVE requires successful management of learner issues, curricular issues, organizational issues, and technological issues. Additionally, knowledge management constitutes one set of products – and issues -- possibly arising from CoPs [6].

3.1 Active Engagement

One of the main attributes of CoPs is the concept of active engagement: between individuals, and between humans and materials. Students need to engage in their learning both cognitively and emotionally so that they can understand new information in terms of their individual contexts [7]. Particularly since CVE draws upon traditional apprentice and intern models of learning, the need to active engagement and interaction among learners and instructors is key, not only at the start but throughout the training [8].

Mayer posits three processes that are essential for active learning: selecting relevant material, organizing selected material, and integrating selected material with prior knowledge [9]. These processes build upon other stages and skills, such as awareness/attention, evaluation, and synthesis. In the first stage, for instance, the learner has to decode the information (e.g., read, listen, view) to understand its vocabulary and gist. They may need to consult other information sources to fully comprehend and evaluate it, which can be enhanced through the use of CoPs. Nevertheless, these processes demonstrate the need to link the internal world and the external world, to build relationships between materials/ideas, and to make decisions. CoPs offer a natural way to facilitate and enrich these processes.

Online learning environments can optimize such interaction because it provides tools for interaction outside of class time in any locale: threaded discussions, group pages, virtual classrooms, wikis, and so on. On the other hand, technology can seem very abstract and remote, because it is often text-oriented. Therefore, CV educators need to design features that that minimize technology limitations and optimize technology possibilities. Instructors should provide training materials that are intellectually stimulating and emotionally engaging (e.g., novel problems and solutions, personable narratives that apply principles to real world settings). Likewise, authentic tasks, preferably with real world connections, should constitute the learning activities used to enable students to practice and demonstrate competency.

In terms of online experience, students – and instructional design -- tend to progress through a number of stages of interaction and learning. Salmon provides a useful framework for identifying these stages. The italicized suggestions explain how instructors can use technology to optimize each stage [10].

1. **Access and motivation.** The instructor sets up the online entity (through locating or establishing
it), and informs learners who choose to access it. The instructor can welcome students via video or audio clip, and include stimulating images that activate the learner’s curiosity. Instructors should also assure students that the learning environment is confidential and safe.

2. Online socialization. The instructor provides opportunities and venues for students to communicate and get to know each other virtually. This interaction might be purely social rather than academically based. The course can include a home page feature where students can share something about themselves, including pictures. A “water cooler” or “café” corner can provide a sanctioned area for personal chatting.

3. Information exchange. Participants, including the instructor, offer and share information, and value that interchange. A variety of communication channels (e.g., threaded discussions, instant messaging, group pages) can facilitate information sharing. A rich collection of materials and links to relevant resources can jump-start learning. Instructors should provide advance organizers and scaffold learning for those students in need. Students should be encouraged to contribute information or good resources found to add to the training body of knowledge.

4. Knowledge construction. Participants, particularly learners, express ideas and give feedback that helps to generate knowledge. Instructors should provide group pages, web 2.0 tools (e.g., wikis and blogs) and other conferencing features. Instructors should assign group projects, and support problem-solving.

5. Development. Learners assume major responsibility for their learning, and need little guidance from the instructor. Instructors should give timely, specific feedback—and encourage others to critically review and ask advice from their peers.

Nevertheless, Wenger, McDermott and Snyder defend the notion of a range of involvement. They assert that most CoPs consist of 10-15 percent core members who often assume leadership roles, 15-20 percent activate members, a majority of peripheral members on the sidelines, and non-members who are interested in the CoPs and may “lurk” there occasionally. The researchers contend that each set of individuals contributes to the CoP, and derives benefits that may, in turn, contribute to the members’ other CoPs as well as to themselves. While most CVE wants high-level interactivity among all learners, this idea of different levels of participation recognizes individuals’ learning preferences. Furthermore, learners may well be applying their new found knowledge to the professional settings to which they belong outside of CVE, which can improve the profession as a whole.

3.2 Technology’s Role

Technology can facilitate CoPs in several ways. One of the most obvious functions of technology is access and storage of resources. CoP members can archive and retrieve documents (e.g., lesson plans, handouts, assessment tools, exemplars) on CDs, audio and videotape, and the Internet. Technological tools can also be used to organize and link documents in meaningful ways as defined by the associated community of practice. In fact, a database of resources can refer to non-digital materials as well as digital ones; however, direct access to those sources requires an extra step as opposed to stored electronic files. Particularly when documents are digitized, they can be easily modified and repurposed for different audiences and objectives. Telecommunications and video expand opportunities to develop and share documents in real time and asynchronously.

The use of technology itself can be optimized through CoPs as more tech-savvy members can help tech neophytes use tech tools in meaningful tasks. This kind of coaching exemplifies the nature of professional development within a community of practice because it recognizes the need to continue to learn about one’s practice. Nonetheless, CV educators need to be aware of learners’ access to technology, and plan for the lowest common denominator. For instance, if learners have dial-in Internet access, then the use of podcasting might need to be minimized. If their computers have no webcam or microphone options, then Skype sessions might need to be limited to online chat.

Particularly with the advent of web 2.0, several technology tools facilitate CoP efforts.

- **Blogs** (web logs) can be used for reflective journals and eportfolio evidence that include comment areas.
- **Wikis** (quick webpage development) enables CoPs to generate knowledge, based on each other’s expertise.
- **Threaded discussion** (linked writing by subject) enables CoPs to discuss issues at any time, any place, and archive their discourse.
- **Social bookmarking** (public lists of recommended websites) helps build sources of peer-reviewed information.
- **Photosharing** offers ways to see relevant visual information, of special importance to students who live far away from professional practice.
• Real-time virtual classrooms enable students to share issues and ideas; some virtual environments feature a shared space for document viewing and editing.

3.3 Training Venues

For short-term professional development, real-time online chat has offered a way to provide guided group discussion. TappedIn, an educational site owned by SRI International, allows K-16 professionals, including librarians, to talk in real time about issues affecting their practice and to strive for educational reform. Topics range from interactive learning to technology in mathematics. Groups set the agenda ahead of time, and can come prepared with materials or questions. Done as a monthly activity, this type of informal educational venue can build a community of practice.

Increasingly, video-enhanced collaboration tools are being used to provide more sensory experiences. Several real-time collaborative tools transcend text-based interchanges:
- Skype is a free two-way telecommunication tool that employs chat, voice and video on a one-on-one basis.
- Elluminate (and similar commercial products) incorporate chat, feedback tools (e.g., signals, polling) voice, small video, and shared “white board” space. It can be used as a presentation platform or as a limited conversation medium.
- Video conferencing provides the closest experience to face-to-face meetings in that a camera and mike on all ends of the connection broadcast signals in real time.

All of these tools require scheduling in order to assure that all parties are present simultaneously. The complexity of that scheduled reflects the complexity of the tool itself. For instance, Skype involves a simple telephone or connection number. Both Elluminate and video conferencing require a host to set up the connection, and the participants then dial in or otherwise connect. Elluminate participants need an Internet-connected computer station, but video conferencing participants also need a camera/video equipment.

Longer-term professional training is usually conducted using web-based solutions such as an online course management system (CMS). Open source solutions such as Moodle provide low-cost instructional design that can transcend transitional Carnegie units to consider modular topics, just-in-time training, and developmental communities of practice. Both professional and higher education entities use this technology to facilitate virtual collaboration and a federated or distributed means to build knowledge. When well-designed, CMS offers several benefits to CoPs:
- increased frequency and quality of out-of-class, student-to-student dialogue (e.g., collaboration on assignments and projects; peer review of work, etc.) via email, online ‘chat’ and discussion group facilities
- increased opportunity for faculty-student communication through individual and group email
- ability of instructors to evaluate efficiently the quality of student work by means of online quizzes and exams and to monitor student effort and engagement in the subject matter on a more frequent and regular through the use of online discussion groups
- mutual reinforcement of out-of-class and in-class student interaction
- increased student confidence in their ability to use facilities such as email, chat rooms, discussion boards

On the other hand, if training simply duplicates the face-to-face experience, then the technological, online features are under-utilized. Therefore, CV educators need to make sure that online delivery includes:
- structured learning modules using a constructivist approach that provide resources/artifacts, learning activities, and authentic tasks to enable students to practice and demonstrate competency
- individual and group work and social spaces
- interactive tools for collaborative communication and authoring (e.g., discussion forums, wikis, instant messaging)
- group projects to foster interdependence, team-building, and increased knowledge gained from sharing different perspectives and expertise;
- opportunities for CoP members to contribute to the body of knowledge
- timely and specific formative assessment through email, peer review, online quizzes, and document commentary. \([11, 12]\)

Online CoPs in CVE do have their disadvantages. Particularly when using CMS, CV educators have to spend considerable time developing and designing the scope-and-sequence, locating or creating relevant resources and support materials, organizing and packaging the content, and uploading onto the system. Even once the course is mounted, in-training workload increases; online instructors find that they need to help student navigate the CMS course space, and they also find that students communicate with their instructors more frequently online, and expect quicker response. For
these reasons, beginning online CV instructors should start small and easy, using low-tech tools if possible, and setting up an open structure that allows for change.

Throughout the process, CV educators -- and their students -- need technological expertise, appropriate hardware and software, and institutional technical support available upon need. The educational institution also needs to find added funding to license the CMS, host it, and support it. Indeed, the educational or professional institution as a whole needs to be involved and supportive of CoP initiatives. Here are some of the factors they should consider in terms of CoP readiness:

- **Knowledge.** Do instructors know how to form, support and maintain CoPs? Do instructors know how to form, support and maintain CoPs on an online environment? Are they willing to learn about CoPs, particularly in online environments? Are administrators willing to allocate adequate human and material resources (e.g., technical staff, instructional designers, CMS applications, servers and other hardware, training areas, scheduled time) to train instructors in developing and supporting CoPs in online environments?

- **Infrastructure.** Does the institution have a CMS or other online training entity in place -- or are they willing to obtain it? Can administrative software manage authentication, authorization, firewalls and security associated with online CoP services? Do servers have adequate hosting and storage capability? Does the system have sufficient bandwidth and high-speed Internet connectivity to handle online traffic? Is the system robust enough to handle emergencies?

- **Value.** What are the educational norms in the institution or organization, and do they allow -- or encourage -- change? Do instructors and administrators value CoPs? Do instructors and administrators value online instruction/training? Do those values translate into funding, support, and incentives (e.g., assigned time, stipends, technical coaching, public recognition, promotion)?

- **Access.** Do instructors, support personnel and students (and other CoP members) have physical and intellectual access to the resources needed to establish, support and sustain CoPs online? What provisions are available to accommodate individuals with special needs (e.g., vision impaired, motor-restricted, non-English speakers)? What partnerships exist between CVE and their in-the-field counterparts? Can allied professionals access online CoP environments?

- **Planning.** Does the institution have a well-developed plan for establishing the resources and services to support and sustain online CoPs? Does it include all relevant stakeholders? Does a clear vision and feasible objectives drive the plan? Have existing and needed resources been identified? Are staffing and funding adequate to implement the plan? What policies need to be addressed? How will be plan be communicated? What assessment methods will be used to monitor and evaluate the effectiveness of the plan, and improve it? [13]

### 3.4 Knowledge Management

To further leverage that generated information, CoPs can consciously engage in *knowledge management.* This term refers to the process of systematically gathering organizational wisdom, organizing those ideas, archiving them, and providing for their easy retrieval and dissemination. The underlying concept is that people learn specialized skills and concepts on the job, which improve their own performance. Examples of such learning includes management techniques, effective communication with employees, diagnosis skills, methods for engaging groups, and tips in videotaping. This practical learning becomes internalized, but sometimes it never becomes explicit. Knowledge management codifies these insights and facilitates their use by others so the overall organization can benefit. In effect, knowledge management serves as another form of professional development as people access and build on the collective knowledge. Additionally, it provides a mechanism to sustain CoPs because the shared documentation can outlast an individual’s presence within the organization.

Knowledge management practices can occur in pre-service training as well as in professional settings. However, these initiatives require the support of the overarching organization and an infrastructure to facilitate data collection and organization. Several decisions need to be made:

- What is the goal of knowledge management effort: best practice, a pool of proven activities, policies and procedures, program planning and assessment, product development, professional development?
- What informational data are needed for each resource: author, date, metatags, subject matter, type of technology used?
- How will resources be standardized, if at all: by format, using templates?
- What kind of digital application will be used? What features should it provide, and what kind of interface is needed?
- How will resources be submitted, organized, stored, retrieved, and maintained?
• What quality control is needed, and who will determine quality?
• What incentives need to be established to optimize content contributions and use?
• What kind of financial, technical, and human support will sustain this effort?

Typically, the major stakeholders need to consider these issues and then encourage the entire CoP to provide input. A small database of documents should be developed and pilot-tested to see how CoP members interact with the information so that effective adjustments can be made early on. In terms of a community of practice, knowledge management is often triggered by technology. Members may have inflated expectations at first as they start to contribute and use the database. As they encounter knowledge gaps or format issues, they may become disillusioned. However, as e-learning becomes integrated into the professional culture and teams start to make a difference, then those early expectations become more realistic, and the CoP—as well as the knowledge management database—becomes more productive and efficient [14].

4 Future Trends

Web 2.0 technology already influences CoP as it facilitates multiple-way communication and group-developed content. Public view of these interactive applications can reflect an effort to offer authentic tasks, but students may be uncomfortable having strangers access their document. On the other hand, web 2.0 collaborative tools are gaining acceptance in business as employers see how these tools can keep their companies competitive. Providing CV students practice in these tools can give them a competitive edge as they enter the work place.

Elearning spaces is another coming trend that will probably impact CoPs. These virtual reality environments provide virtual entryways, teaching e-spaces, social e-spaces, areas for individual documentation, online public spaces for collaborative work, communication “surfaces” such as web-based whiteboards, and groupware and interfaces such as wikis to generate knowledge collectively [15]. One option for elearning spaces is a multi-user virtual environment (MUVE), such as Second Life. In this visually rich online setting, each person has an avatar (an individual’s visual representation) who can move around the computer-generated three-dimensional simulated space. While intriguing, MUVEs require a steep learning curve and high-powered computer capability, which may challenge less tech-savvy students.

In terms of tools, mobile technology will play an increasing role in CoPs. The equipment is becoming smaller and more sophisticated, and their storage capacity is also increasing. Smart phones are just the start as these mobile devices include visual/video tools as well as access software programs. Particularly as millennial students are used to cell phones, the ability to use them to advance group knowledge, not just share two-way conversation, can be an appealing and feasible strategy to promote CoPs [16].

On a more profound level, online CoPs are forming a lifelong career connections, which can start as early as middle school and continue past retirement. Already, professionals are mentoring teenagers as a way to recruit them, particularly into science and technology fields. Educational institutions are forming more partnerships with business than ever, not only for community support but also to inform students and instructors – and link to professional development in the field. Networks of field-specific CoPs can offer a global, lifelong perspective and socially responsive practice.

5 Conclusions

The need to incorporate the features of a community of practice (CoP) in CVE becomes increasingly apparent as this work philosophy permeates the professional workplace. Additionally, the need for telecommunication because of globalization and energy costs amplifies this collective approach as it is implemented in a web environment. Particularly as web 2.0 tools facilitate collaboration, online CoPs can thrive. Thus, CV educators need to provide their students with opportunities to experience and sustain CoPs in training environments. Not only do students engaged more actively in their learning, but they gain from multiple perspectives, and can develop more complex projects with the help of others. For online CoPs to succeed, CV educators need to design instruction that helps students get to know each other, and collaborate. Technological tools can facilitate such interaction, overcoming time and space issues. Nevertheless, equity issues of physical and intellectual access need to be considered when creating such online learning environments.

CoPs not only provide authentic training opportunities, but can also link pre-service and in-service professionals. Therein lies perhaps the greatest reason for introducing and practicing CoP habits.

References: