

Using Communities of Practice to Enhance Student Learning: Examples and Issues

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Abstract

Communities of practice are considered to be an effective way to enhance the creation and management of knowledge within organizations. At their most fundamental level, communities of practice consist of individuals collaborating to acquire knowledge, to learn. For this reason, communities of practice are a natural fit with the educational process. This paper will begin by describing the learning that takes place in communities of practice, and showing why the concept is relevant to education. It will look at examples of communities of practice being used to enhance student learning, as well as some of the issues and difficulties that have been encountered. Special attention will be paid to the use of technology in supporting these communities of practice.

Motivation

Enhancing Student Learning

The motivation to use communities of practice to enhance learning originates in the shortcomings of traditional educational programs. As summarized by Hogan, “the abstract, decontextualized knowledge typically gained in school does not effectively prepare students to use and apply knowledge in complex, real-world contexts, [and does] not allow them to build identities as competent participants in communities of practice beyond the classroom (586-87). Another limitation is that in the classroom, knowledge is usually perceived as being localized in the teacher and the textbook. Learning then becomes a question of the student acquiring this knowledge in order to do well at tasks designed specifically to evaluate their success at having acquired this particular knowledge (49). In practice, errors have real consequences, while in the classroom, the only thing at stake are the students’ academic standings (Harley 47). While this marks are important, they are not always a sufficient motivator for students to fully apply themselves.

In an attempt to better understand learning, Lave and Wenger noted that while all activity is situated within a larger context (33), the act of learning is also an “integral and inseparable aspect of social practice” (31). Learning should be considered not only from the point of view of “cognitive processes and conceptual structures” but in terms of the “kinds of social engagements [that] provide the proper context for learning to take place” (Hanks 14).

Lave and Wenger defined the term legitimate peripheral practice (LPP) as the process by which individuals learn how to participate in and become part of a community of practice (CoP) (29). They make the following important point relating to LPP and learning:

Legitimate peripheral participation is not itself and educational reform, much less a pedagogical strategy or a teaching technique. It is an analytic viewpoint on learning, a way of understanding learning. (40)

That is to say, that investigating and designing educational environments based on the CoP/LPP model places the focus on the learning instead of on the instruction (Brown and Duguid 10). To paraphrase Wenger, learning is not the result of instructional design, but rather a response to it (233). One criticism of the CoP/LPP model is that while (correctly) takes the focus off of the instructor, by focusing on the community, it goes against constructionist theory which places the learner at the centre of the learning process (Hay 36). This interpretation is not entirely accurate, since rather than focus on any single aspect of the learning process, the CoP/LPP model in fact provides a more holistic view of learning, encompassing the learner as well as the formal and informal instruction that occurs as the learner interacts with others in the community.

Simply defined, community of practices are “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger, McDermott, and Snyder 4). It has been suggested that student learning can be enhanced by bringing together students and practitioners in a CoP (Hung and Nichani). Students will learn most effectively if they are made to solve real problems and complete authentic tasks within the context of the actual practice. This includes, of course, interaction with actual practitioners who work with the students and assist in their learning. Note that this differs from existing practices that place the student teacher in a real school in order to gain experience. Placement and fieldwork practices focus on the setting in which the student will practice, while communities of practice focus on the development of the student through interaction with a community of people interested in the practice (Barab and Duffy).

Before looking at specific examples, it is worth noting that educators have integrated practice into their curriculum to different degrees (see Figure 1).

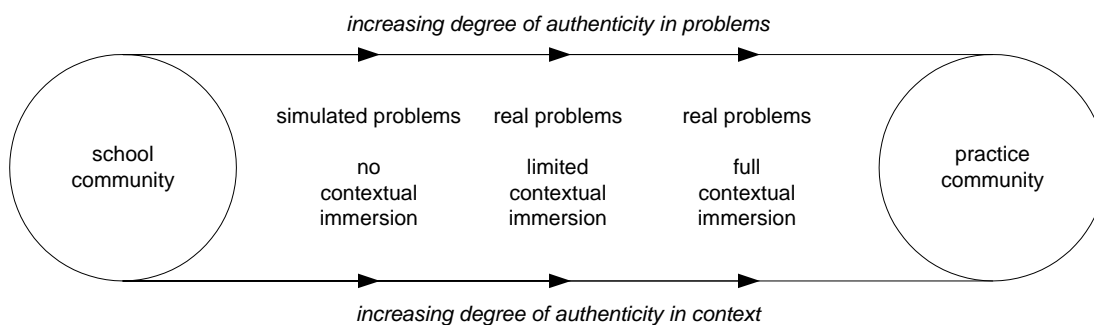


Figure 1. Continuum of immersion into practice. Adopted from Hogan (617).

The greater the degree of authenticity, the more the students will be able to be integrated into the practice. Different programs and courses benefit from different levels of immersion. And as we will see in the examples that follow, moving towards full immersion requires substantial changes to course design. Careful consideration must be given to the optimal location for student learning to occur on this continuum.

Bridging the Gap between Research and Practice

In addition to enhancing student learning, bringing a community of practice perspective to education also provide academics and researchers with the opportunity to influence professional practice. Educators must “accept [their] responsibility to develop not only the professional but the profession” (Buysse, Wesley, and Able-Boone 191). Past efforts to bridge the gap between research and practice have failed, largely for reasons of power, status, and perceived need for researcher objectivity (Buysse, Sparkman, and Wesley 264). Communities of practice may be able to address the situation more effectively. For example, pre-service teachers, working in a CoP made up of teachers, researchers, and fellow students, constructed their own knowledge regarding the practice of teaching, as opposed to passively ‘receiving’ knowledge from the teachers in their placement school. (Frykolm 318). This allows the knowledge they acquired in university to be integrated into their practice and possibly the practice of their coworkers as well. Conversely, there is a need for researchers to recognize that practitioners as well as academics are creators of knowledge (Buysee, Wesley, and Able-Boone 192). In this way, the community of practice should be thought of as a knowledge bridge between the university and the professional practice, with the knowledge created on both sides and flowing between the two through the social interactions of the community (see Figure 2).

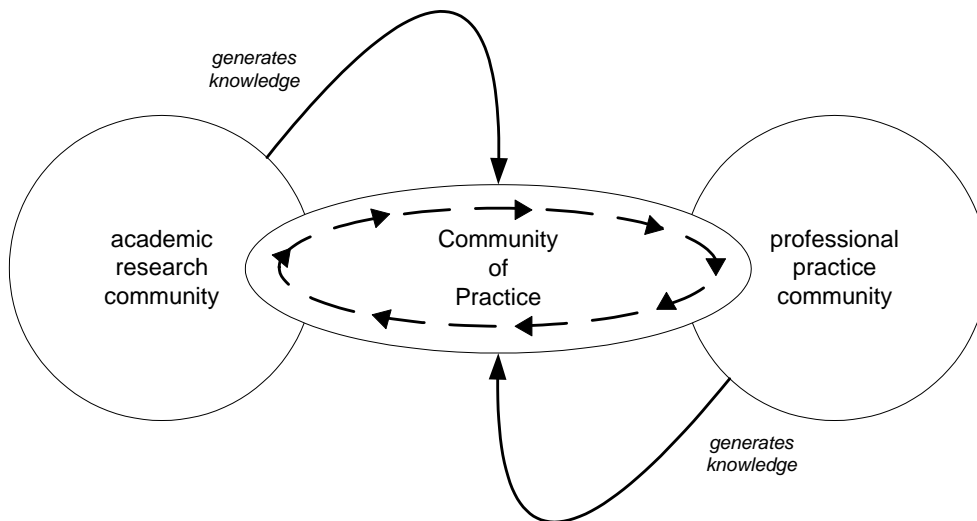


Figure 2. Community of Practice as a knowledge bridge between research and practice.

Examples of using Communities of Practice to Enhance Student Learning

Since “learning is an integral and inseparable aspect” of membership in a community of practice (Lave and Wenger 31), one could in fact view any CoP as being comprised of students (i.e. novices) who are learning. This review will limit itself, however, to situations where CoPs have been used with students in a formal, academic setting. While not comprehensive, the review will attempt to illustrate the variety of ways in which CoPs are being used to enhance student learning.

Examples in Teacher Education

In the cases reviewed for this paper, the most extensive use of communities of practice with students learning has occurred in the support of teacher education.

Hudson looked at a CoP involving student teachers training to teach math at the secondary level. The community consisted of students at all stages of the program, as well as the tutors and instructors. Hudson observed online discussions that took place around a number of relevant journal articles that participants were asked to read and discuss. In the discussion and debate that ensued, the community was seen to become fully engaged in an attempt to make sense of the conflicting views that had arisen.

Hutchinson studied a CoP that was fostered to support pre-service teachers specifically in understanding the issues and best practices relating to inclusive education. Cases were used as a focus point for discussions around the issues and difficulties encountered by teachers in trying to accommodate “exceptional learners”. The study showed that the discussion of cases in a CoP “may foster inclusive beliefs and practices during pre-service teacher education.”

Mentis, Ryba, and Annan looked at a virtual learning environment (VLE) that was developed to support a Masters of Educational Psychology distance education program. The study involved 32 post-graduate students, all of whom were working in the field of education while continuing their education in the Masters program. Although the program provided opportunities of face-to-face interaction, it was felt that the students would benefit from a VLE where they could access information and communicate with one another. The VLE would help to bridge the gap “between university-based learning and real-world application.” The study found that indeed students not only rated the collaborative aspects of the VLE highly, but valued the collaborative aspects of the site more than the informational aspects. The community of practice that emerged was more valuable to the students than was access to stores of explicit, encoded knowledge.

The Community of Teachers project (Barab and Duffy) was designed to support students undertaking fieldwork and to improve the overall relationship between the university and the school system its students typically went on to find work in. The community consisted primarily of current students and instructors, as well as students who had graduated and were now working, allowing them to share their understanding and insights as practitioners. Participants communicated through face-to-face seminars, by phone, or by e-mail. Community members discussed their experiences in the field, shared their problems, and helped each other to find possible solutions. This allowed the student

teachers to improve their understanding of the practice and learn from each other even though they were all doing their fieldwork in different schools. The continued participation of graduates ensured that over time the community would develop a stronger base of practitioners, allowing for a greater variety of skills and experiences for the members of the community to draw upon.

Clarke studied a similar CoP for education students who were doing their fieldwork in schools all over Northern Ireland. The students had built up relationships and trust during their face-to-face studies. The fieldwork scattered them all over Northern Ireland. An online discussion group was used to provide students with a way to keep in touch, to offer each other support, and to reduce feelings of isolation. Although the initial community was made up of only of students, as time progressed, the first students to join the community naturally moved to occupy the role of practitioner. These examples illustrates the importance of a community of practice being able to regenerate itself on a regular basis.

One of the shortcomings of the Community of Teachers mentioned previously was that there was not much effort made to integrate the research being done at the university with the practice of new teachers (Barab and Duffy). In studying a small community of practice made up of three pairs of pre-services teachers and doctoral students, Fryholm observed two-way knowledge sharing between people with different levels of expertise. The objective of this pairing was for the doctoral students to provide guidance to the pre-service teachers. This was done both in one-on-one meetings, as well as in group meetings involving all three pairs. The pre-service students appreciated the group discussions, stating that it both gave them a change to share and reflect on their experiences (Fryholm 312), but also to realize that the other students were encountering many of the same difficulties as they were (313). The doctoral students, meanwhile, found that their involvement in the community gave them valuable insights into the practice that were sure to have an impact on their research. The cooperating teachers also found the students' insights to be helpful to their own practice.

Examples at the Primary- and Secondary-level:

The National Geographic Kids Network (Barab and Duffy 44) is an example of integrating real-world practice into the primary-level classroom curriculum. The community was made up of students in grades 4 through 6 from a number of different schools, their teachers, as well as Kids Network staff members. The Kids Network staff played the role of practitioner, and offered guidance to the students on how to carry out science research projects in their area. The staff collected and integrated student findings, presenting the integrated report back to each of the classes. In this and other ways, the staffers acted to connect the classrooms together. It is worth noting that collaboration between classes carried over to other parts of their curriculum (writing projects, etc.) as well.

At the secondary-level, a CoP model has been used to teach students mathematics (Goos). Rather than dictate to students how to do the math, the course was planned to allow students to work collaboratively to make their own sense of mathematics. The

teacher provided students with the basics they needed to think and communicate about mathematics. Instead of writing down formulas and learning to do problems by rote, students developed their own methods for solving mathematical problems through reflection and social interaction. Students felt that they learnt more this way than when they were simply told what to do.

Examples in Language Instruction

Haneda looked at the teaching of Japanese as a foreign language. Learning a language can be considered a “situated activity”, “a process of increasing participation in the performance of community practices.” The class was made up of students with a wide range of skills in Japanese, from students with great difficulty to those who were “almost-native speakers”. Because of the varying levels of ability, each student had their own learning objectives, meaning that instruction would have to be tailored each students’ situation. Students were observed to play several different roles in the community. An advanced student would be considered an expert as they assisted and interacted with the less-skilled. The same student would be considered a peer by the other advanced students, or a novice when interacting with the teachers. The teachers role was to establish and maintain the environment for the student’s learning to take place, including both learning materials and the opportunities for students to communicate and work collaboratively. The teacher also monitored the progress of students and provided instruction to individual students as required, at a level appropriate to their learning needs.

Mavor and Trayner looked at an interesting case where language is taught with an eye to a specific practice area. Taught in Portugal, the course was for Portuguese students with varying levels of English ability. The objective of the course was for the students to learn the English skills they would need to participate in a specific profession. The design of the course was informed by studying the target community of practice and identifying the social interactions and communications that are a part of participation in that community. The course being studied was for students working towards a career in human resources, and was designed around the preparation of a professional development plan for one of their classmates. In doing so, the students both learnt and used the language skills necessary to this common HR practice. Because students saw the relevance of learning the task, they were more likely to put in the effort to make it happen. Also, since they needed to draw on a wide variety of their existing knowledge to complete the task, they were more fully engaged in their learning (354). Students were satisfied with the results, and appreciated “the opportunity to formulate and express themselves as emerging professionals (354).

Examples from Nursing

Students nurses that are placed in actual practice situations inevitably have to navigate the periphery of the community of nurses at the host institution. Cope, Cuthbertson, and Stoddard studied this situation, noting “that placements have some of the characteristics of a CoP as far as the students are concerned” (855). Students began to feel accepted into

the community once they demonstrated that they could do the initial work assigned to them and more responsibility was then given. While students had the opportunity to apply the conceptual knowledge they had gained from their studies in a real practice setting, they were not always successful in doing so. In some cases, the situation made their conceptual knowledge that much more real, more grounded, so that it made more sense to them. In others, however, the gap between what was studied and actual practice was too wide for students to apply the concepts they had learned. In addition, some of the placements were too short for students to become legitimate participants in the practice. Students in this last situation felt apart from the group, more in the way than part of the practice (853).

Issues with Communities of Practice in Learning

Community Membership

With a few exceptions (Hogan; Maynard; Mentis, Ryba, and Annan), most of communities in these initiatives involve only students and instructors, meaning that members are either novices or experts. In a typical community of practice, we would expect to see a more varied distribution of levels of expertise among members. This strong divide between novices and experts may limit the potential of the CoP to enhance student learning. As noted by M. C. Pugach, it is important for learning to occur “across levels of expertise rather than within them” (qtd. in Buysee, Sparkman, and Wesley 270). As has been previously noted, communities that allow graduated students to remain in the community after they themselves become practitioners may mitigate this effect somewhat (Barab and Duffy; Clarke).

Power Relationships

Hogan describes a less successful attempt at integrating practice into the learning process. An arrangement was made with a local environmental agency for the students to participate in real fieldwork as part of their studies. Students were to design questionnaires to be circulated to local residents, then gather, analyze, and present the data. In one case, the questionnaire was designed by the students but not used due to credibility issues (597), preventing the students from participating in the full practice cycle (gather, analyze, present). Students also developed a plan to survey a watershed, but the requirements for the survey changed, again resulting in the students efforts being wasted (598). In another case, a second questionnaire designed by the students was significantly reworked by agency personnel to bring it in line with requirements that had never been communicated to the students (603).

This study revealed several issues to be wary of when integrating a real-world CoP into the curriculum. The first of these relates to how power relationships can affect learning in a community of practice. Because the teacher had no power over the environmental agency, he was unable to require it to behave in a way that would support student learning. When the agency refused to use the questionnaires, the teacher had little

recourse. In addition, although the teacher was often frustrated at the students' unwillingness to take responsibility for their own learning, he was never able to let go of his own control of the class enough to allow for this to happen (Hogan 607-08). Students were reluctant to speak their minds or talk openly in this environment for fear of being constantly evaluated by the teacher. More importantly, they were not given the support or the resources required for them to effectively direct their own learning.

According to Lave and Wenger, it is important to understanding the ways in which power can be used within a community to limit both the opportunities for novices to participate as well as their ability to make progress (42). Contu takes this further, emphasizing the effect of power on how the community comes to a consensus on knowledge and meaning. "Is [consensus] an expression of unforced agreement, or is it a hegemonically stabilized outcome of a power play of social forces?" (292). The same dynamic can be expected in the classroom, where the instructor traditionally has much more power and authority over the learning process than do the students. Introducing practitioners to this situation, as seen in Hogan's study, adds another level of complexity to the power relationships.

Along the same lines as issues of power, Hay notes that in most educational settings, students traditionally have not had the ability to influence what is taught nor how it is taught. He extends this criticism to communities of practice in general, noting that students cannot affect the practice until they are at the centre of the practice. They can only get to the centre of the practice by learning to accept the practice as it is. That is to say, once they are in a position to effectively make changes to the community, they no longer see the need to do so (35).

Student Legitimacy

Another issue raised by Hogan's study is the importance of the students being portrayed as legitimate, authentic participants in the practice. The environmental agency was not willing and failed to allow students to participate in the actual work of the agency. In addition, they did not have the resources nor the inclination to take a mentoring role towards the students. The students, however, had service requirements to fulfill for the course. Because both the agency and the teacher were unable to come up with any legitimate tasks for the students to do, the students ended up logging service hours doing tasks such as cleaning up a riverbank, picking vegetables, and working at the local soup kitchen (609). The following quote from one of the students sums up their feelings:

"I just think that we all sort of felt like we were floundering with our knowledge. Because, you know, you can go to a stream and you can do clean-ups and everything, but then after awhile you want to know more than just how to pick up garbage." (613)

This concern is generalized succinctly by Hay, who asks how to address communities that are exploitive of newcomers, who see novices as resources to be manipulated, formed, and exploited by the community, not as legitimate participants who are to contribute to the work and evolution of the community (34). Cope, Cuthbertson and

Stoddard, in a less critical tone, noted that while social acceptance into a CoP is conferred to almost everyone, professional acceptance is often withheld until the individual displays the appropriate level of knowledge and expertise.

Evaluation

Evaluation is another problematic area raised by Hogan's study. In this case, evaluation was based on the students completing a certain number of service hours and keeping a journal. Students were forced to accept the teacher's definition of service, limiting their ability to direct their learning (614). Academic courses have specific learning objectives, and evaluation is meant to measure the degree to which students have attained these objectives. How can teachers both enable the practitioners and/or the students to guide their learning, while still defining the evaluation methods that will be used? And if the teacher allows the evaluation methods to be determined by the students, how can they ensure any consistency in the academic process?

Overlapping Communities

When we talk of introducing CoP into academia, we are not introducing a community to a space where none exists, but rather adding another layer of community for students to participate in. Academia has its own communities of practices made up of students, instructors, researchers, and administrators engaged socially in pursuing the common but diverging goal of knowledge creation. These communities, in turn, each have an impact on the learning done by students (Lave and Wenger 40). Placing students in the overlapping region of these communities, where there are sure to be differences in the objectives, accepted knowledge and learning methods, adds further layers of complexity for students already facing a substantial challenge. However, students who intend to move from academia and into the world of practice will need to navigate these differences at some point. Introducing students to the CoP while they are still in academia and having it continue after they are established in practice will hopefully make transition an easier one.

Use of Technology to Support Communities of Practice in Education

Whereas most e-learning is focused on instruction, using technology to support learning in a CoP means to build technology that supports learning (Brown and Duguid 10). Designers cannot implement "rigid, preplanned design and delivery" technologies (Harley 49). Instead they must be flexible, providing guidance and support to students.

Information technology generally requires that information be encoded in some form in order to be usable by the system and made available to users. Brown and Duguid note that technology used to support CoP can be expected to have a strong bias towards explicit knowledge (13). This introduces a risk that only the explicit knowledge of the community will be made available to its members, leaving out the tacit portions. This incomplete rendering of the community may make it difficult for people to engage in

authentic practice through the technology alone. To address this, designers must consider the technology within the context of the practice, mindful of how it will be used by students gain an understanding of the material (i.e. the practice) through social interactions centered around reified artifacts, explicit knowledge that has been encoded as text, multimedia, or even software (i.e. simulations) (13).

The main emphasis of technology should be to enable community participants to share experience (Finerty). Computers can help students locate community resources (people, information, etc) based on their need (Hay 37). In addition, computers can be used to create connections between people in a community and across community boundaries (37). For example, information technology makes it easier to allow practitioners to interact with students in the classroom (Hung and Nichani). These are connections that traditionally, for a variety of reasons, may have been difficult or not even possible.

Owen studied the use of a virtual learning environment (VLE) to support the learning of a community of teachers from all over Europe. The community included both pre-service teachers as well as practitioners. One major benefit of the VLE was that it allowed participants to communicate in an asynchronous, location-independent manner. Owen's findings were that although the communications were asynchronous, there was a time-dependency on participation. Conversations were expected to be contributed to in a reasonable timeframe, especially the conversations involving students who are in courses of a fixed duration. Although participants read almost all messages posted, they replied to only few. This may have been due to uncertainty on how much to contribute: Should their responses be several paragraphs in length? A few sentences? One sentence? Because of this, collaboration was limited.

Conclusion

This paper has shown how communities of practice are an important aspect of making academia more relevant to real-world practice. Communities of practice can both help to better prepare students for their professional careers, as well as provide a conduit for knowledge to be shared between academic researchers and professional practitioners. While some success has been had using communities of practice to enhance student learning, issues such as community membership, power relationships, student legitimacy, evaluation, and overlapping communities still need to be addressed.

Although there are still many issues and questions to be addressed, the potential benefits of using communities of practice in academia are enough to encourage continued efforts towards their resolution.

Works Cited

- Barab, Sasha A. and Thomas M. Duffy. "From Practice Fields to Communities of Practice." Theoretical Foundations of Learning Environments. Ed. David H. Jonassen and Susan M. Land. Mahwah, NJ: Lawrence Erlbaum, 2000. 25-55.
- Brown, J. S. and Paul Duguid. "Stolen Knowledge." Educational Technology 33.March (1993): 10-15.
- Burton, M.C., Jand .B. Walther. "A survey of web log data and their application in use-based design". Proceedings of the 34th Annual Hawaii International Conference on System Sciences, (2001): 1853-1862.
- Buysse, V., K. L. Sparkman, and P. W. Wesley. "Communities of practice: Connecting what we know with what we do." Exceptional Children 69.3 (2003): 263-77.
- Buysse, Virginia, W. Wesley Patricia, and Harriet Able-Boone. "Innovations in Professional Development: Creating Communities of Practice to Support Inclusion." Early Childhood Inclusion. Ed. Michael J. Guralnick. Baltimore, MD: Paul H. Brookes Publishing, 2001. 179-200.
- Clarke, L. "Putting the 'C' in ICT: using computer conferencing to foster a community of practice among student teachers." Technology, Pedagogy and Education 11 (2002): 163.
- Contu, Alessia, and Hugh Willmott. "Re-embedding situatedness: The importance of power relations in learning theory." Organization Science 14.3 (2003): 283-96.
- Cope, P., P. Cuthbertson, and B. Stoddart. "Situated learning in the practice placement." Journal of Advanced Nursing 31.4 (2002): 850-56.
- Finerty, T. "Integrating learning and knowledge infrastructure." Journal of Knowledge Management 1.2 (1997): 98-104.
- Frykholm, J. A. "Beyond supervision: learning to teach mathematics in community." Teaching and Teacher Education 14.3 (1998): 305-22.
- Goos, M. "Making Sense of Mathematics: The Teacher's Role in Establishing a Classroom Community of Practice." (1996): 1-16. ERIC/EDRS. ED404178.
- Haneda, M. "Second language learning in a 'Community of practice': A case study of adult Japanese learners." Canadian Modern Language Review 54.1 (1997): 11-27.
- Hanks, William F. "Forward." Situated Learning: Legitimate Peripheral Participation Ed. Jean Lave and Etienne Wenger. Cambridge: Cambridge Press, 1991. 13-24.
- Harley, Shaun. "Situated learning and classroom instruction." Educational Technology.March (1993): 46-51.

- Hay, Kenneth E. "Legitimate peripheral participation, instructionism, and constructivism: Whose situation is it anyway?" Educational Technology. March (1993).
- Hogan, K. "Pitfalls of community-based learning: How power dynamics limit adolescents' trajectories of growth and participation." Teachers College Record 104.3 (2002): 586-624.
- Hudson, B. "A social perspective on teaching and learning in the context of computer-mediated communication in teacher education." Journal of Information Technology for Teacher Education 8.3 (1999): 349-60.
- Hung, D. and M. Nichani. "Bringing communities of practice into schools: Implications for instructional technologies from Vygotskian perspectives." International Journal of Instructional Media 29.2 (2002): 171-84.
- Hutchinson, Nancy L. and Andrea K. Martin. "Fostering inclusive beliefs and practices during preservice teacher education through communities of practice." Teacher Education and Special Education 22.4 (1999): 234-50.
- Lave, J. and E. Wenger. Situated Learning: Legitimate Peripheral Participation. Cambridge: Cambridge Press, 1991.
- Mayvor, S. and B. Trayner. "Aligning genre and practice with learning in Higher Education: an interdisciplinary perspective for course design and teaching." English For Specific Purposes 20.4 (2001): 345-66.
- McLellan, Hilary. "Evaluation in a situated learning environment." Educational Technology. March (1993): 39-45.
- Mentis, M., K. Ryba, and J. Annan. "Creating authentic on-line communities of professional practice." e-Journal of Instructional Science and Technology 5.1 (2002).
- Owen, M. "Structure and discourse in a telematic learning environment." Educational Technology & Society 3.3 (2000).
- Wenger, E. Communities of Practice: Learning, Meaning and Identity. Cambridge, UK: Cambridge University Press, 1998.
- Wenger, E., R. McDermott, and W. M. Snyder. Cultivating Communities of Practice; A Guide to Managing Knowledge. Boston, MA: Harvard Business School Press, 2002.