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Communities of Practice and virtual learning communities: benefits, barriers and success factors

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Summary
A virtual Community of Practice (CoP) is a network of individuals who share a domain of interest about which they communicate online. The practitioners share resources (for example experiences, problems and solutions, tools, methodologies). Such communication results in the improvement of the knowledge of each participant in the community and contributes to the development of the knowledge within the domain. A virtual learning community may involve the conduct of original research but it is more likely that its main purpose is to increase the knowledge of participants, via formal education or professional development. Virtual learning communities could have learning as their main goal or the e-learning could be generated as a side effect.

Virtual communities of practice (CoPs) and virtual learning communities are becoming widespread within higher education institutions (HEIs) thanks to technological developments which enable increased communication, interactivity among participants and incorporation of collaborative pedagogical models, specifically through information communications technologies (ICTs) They afford the potential for the combination of synchronous and asynchronous communication, access to -and from- geographically isolated communities and international information sharing.

Clearly there are benefits to be derived from sharing and learning within and outwith HEIs. There is a sense of connectedness, of shared passion and a deepening of knowledge to be derived from ongoing interaction. Knowledge development can be continuous, cyclical and fluid. However, barriers exist in virtual CoPs and these are defined by the authors and illustrated with quotes from academic staff who have been involved in CoPs.

Critical success factors (CSFs) for a virtual CoP are discussed. These include usability of technology; trust in, and acceptance of, ICTs in communication; a sense of belonging among members; paying attention to cross-national and cross-cultural dimensions of the CoP; shared understandings; a common sense of purpose; use of netiquette and user-friendly language and longevity.

The authors recognise the enormous potential for the development of CoPs through e-mail discussion lists and discussion boards but have themselves experienced the difficulties inherent in initiating such a community. These are corroborated and illustrated with text from interviews with academic staff. Much of the literature on CoPs emanates from outside Europe, despite the fact that e-learning articles have a large diffusion around Europe. The authors suggest further exploration of this topic by identifying and studying CoPs and virtual learning communities across EU countries.

Keywords

Communities of practice; collaborative; environments; informal learning; interactivity; usability; e-learning

Introduction

A Virtual Community of Practice (CoP) is a network of individuals who share a domain of interest about which they communicate online. The practitioners share resources (for example experiences, problems and solutions, tools, methodologies). Such communication results in the improvement of the knowledge of each participant in the community and contributes to the development of the knowledge within the domain. Virtual CoPs may share news and advice of academic/professional interest but are unlikely to undertake joint projects together – this is more the role of a Distributed Research Centre (Bos et al, 2007). A virtual learning community, on the other hand, may involve the conduct of original research but it is more likely that its main purpose is to increase the knowledge of participants, via formal education or professional development. Virtual learning communities could have learning as their main goal or the e-learning could be generated as a side effect. Informal learning rather than more formal learning occurs within a virtual CoP and, according to Lave & Wenger this involves "the process of becoming a full participant in a sociocultural practice" (Lave & Wenger, 1991: 29) whereby more experienced participants pass on to neophytes the knowledge and skills they have acquired and, in consequence, the shared expertise of the participants is enhanced.

Owing to technological developments, academic staff and students in higher education institutions (HEIs) now have the opportunity to operate in improved learning environments through increased communication, interactivity among participants, and incorporation of collaborative pedagogical models, specifically through information communications technologies (ICTs) (Schrum, 1998; Robey, Khoo, & Powers, 2000; Rogers, 2000; Stacey, Smith & Barty, 2004). Using ICTs in learning environments afford the potential for the combination of synchronous and asynchronous communication, access to -and from- geographically isolated communities (Hlapinis & Dimitracopoulou, 2007) and international information sharing.

Benefits of sharing and learning

Engaging in a virtual CoP enhances the learning environment since, according to Johnson (2001), "the learning that evolved from these communities is collaborative, in which the collaborative knowledge of the community is greater than any individual knowledge" (Johnson 2001: 34). This is similar to the concept of synergy in which two or more discrete agents acting together create an effect greater than that which would be expected from the separate activities of the individual agents. It also echoes Vygotsky's (1978) argument that a person's learning may be enhanced through engagement with others which enables the extension of that person's capability to a new, higher level.

One example of this is the use, by two researchers (Winkworth & Gannon-Leary, 1999), of a virtual CoP in the form of a discussion list, to supplement research they had conducted for a conference paper. The topic was government interest in library performance measures and they wished to gain an international perspective. Knowing that membership of a related discussion list (lis-perf-measures) comprised some 400 information professionals from more than 30 countries, they posted a request to the list for additional data. Using this method they were able to gain up-to-date information from fellow professionals about the situation in their countries. The data was presented at the conference and disseminated via the proceedings to the wider professional and academic community.

Much emphasis is given, when virtual CoPs are discussed, to the concept of sharing, e.g. Wenger, McDermott and Snyder (2002) discuss how common ground is found by CoP members as they "feel connected … and have invaluable insights they can learn from each other" (Wenger et al, 2002: 71). The same authors, discussing the development of CoPs in the workplace, see them as "groups of people who share a concern, set of problems or

passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger et al, 2002: 4). Knowledge development in a CoP, therefore, is continuous, cyclical and fluid with no clearly defined beginning or end.

As White and Pagano (2007) comment, the concept of a CoP has been given currency in HE discourse by practitioners in emergent areas of networked learning. Lave and Wenger's work did not produce a new pedagogical approach but provided an analytical view of learning, questioning the place of formal education. This shifted the emphasis from the abstract bodies of knowledge taught in formal education towards the 'situated learning' that occurs as people engage with real-world problems in ways which may already be mediated for them by existing CoPs (Brown, Collins & Duguid 1989; McLellan 1995; Fox 2005). As Fox (2005) says, networked learning has, "as no educational process has had before, the capability to facilitate and enable new forms of imagined community" (Fox 2005: 108). Lave and Wenger (1991) discuss learning as participation in a social world describing how people learn better in social settings and through social interaction. Virtual CoPs encompass this concept in that they establish a networked environment where the necessary interactions that improve learning can occur (Wenger et al., 2002). The interactions within these communities focus around knowledge sharing within the membership, who may range from experts through to novices. Via the interaction of the expert and novice, a neo-apprenticeship style learning, similar to that proposed by Vygotsky, can occur. Learners participating in a virtual CoP are assimilated into the sociocultural practices of the community and gain knowledge/skills from those community members positioned as masters (Lave & Wenger 1991). This view reiterates the model of apprenticeship or learning in social and situated contexts, especially in the workplace (Fowler & Mayes, 1999; Fox, 2000; Warhurst, 2003).

Brown and Duguid (2002) suggest situated learning is "knowing how to be in practice", rather than "knowing about practice" (Brown & Duguid 2002: 138), and thus involves a process of identity development for the newcomer through participation in the practice of the community. Becoming a member of a virtual CoP and developing knowledge and skills is, therefore, important in identity formation of the newcomer.

This is about the member describing their own engagement…in terms of what they're hoping to learn out of it…they model their own capabilities, so that they create themselves as somebody who has more value in relation to the context that they're working in… (UK academic) [1]

This factor has been subject to some criticism with regard to CoPs since it may result in the perpetuation of communities and commonality rather than supportive of growth, change and diversity (Eraut, 2003).

Barriers to virtual CoPs and virtual learning communities

The first potential barrier to the virtual CoP may be the discipline involved. In some areas, such as the sciences, cutting edge knowledge may be difficult to disseminate to large groups since it may require specialised expertise and may be difficult to aggregate or represent (Szulanski, 1992; Olson & Olson, 2000; Bos et al, 2007). Secondly, in many disciplines, academics enjoy a great degree of freedom and exist in a culture of independence rendering open communication more difficult. With colleagues and people known personally to you, there is a sharing of tacit knowledge and transactive knowledge (i.e. you know what your peers know) (Hollingshead, 1998; Ozdemir, 2007).

Each profession has its own terminology… we have a very diverse language (UK academic)

A few have said how much of a struggle they have had with the language. They have not all been from overseas – a few have been in the UK – it is all cognitive and cultural, all linked. (UK academic)

The third barrier, therefore, is collegiality since motivation to join a virtual CoP may be weak where there is a context of high collegiality, e.g. a strong community of people who are physically co-located (Smith et al, 2005)

It's more difficult to create the flow of information. We try really hard to get members to communicate within their own group…but it's quite difficult without the face-to-face thing to break the ice (UK academic)

Lack of peer support and lack of contact with others… The lack of contact was quite frustrating. (UK academic)

Another barrier involves the shifting membership of a virtual CoP which as Wenger et al. (2002) point out is fluid in its composition. In consequence, virtual CoPs need to work hard to maintain energy and a high degree of participation. Individual members of a virtual community must engage with it in order that it may develop and grow and have meaning (McMillan, 1996; Gibson & Manuel, 2003; Ellis et al 2004). Stuckey and Smith (2004) argue that there are identifiable features to a successful CoP, and most importantly the ability to sustain the community, the chief of which is the need for 'leadership' which, in the case of a CoP, may be a moderator, facilitator or list owner.

When you're delivering it electronically, a lot of members just don't 'get it', but you can't spot that… (UK academic)

Some members don't say a word on-line. They'll just sit there. There's a lot of 'lurking' goes on… (UK academic) [2]

A fifth barrier involves trust. The virtual CoP lacks the opportunity for face-to face interaction and socialising which can consolidate group membership. Consequently individuals may fail to engage in the CoP, preferring to work autonomously. Trust building is vital for sharing (Jarvenpaa & Leidner, 1999; Kirkup, 2002; Gibson & Manuel, 2003; Ellis et al 2004) and trust primarily develops through face-to-face interactions. In the virtual environment, identities can remain hidden and members may adopt different personas (Tomes, 2001; Turkle, 1997).

You're trying to replace a real learning environment with a virtual one… it's a very 'touchy-feely' thing. There's a whole raft of things that the virtual environment won't let you do … (UK academic)

A sixth barrier also involves trust but at an institutional level. Crossing virtual boundaries between institutions can result in institutional-related problems, especially legal issues, e.g. data protection, intellectual property (Stokols et al., 2003, 2005; Cummings & Kiesler, 2005; Bos et. al. 2007).

I worry about intellectual property rights: We give too much away…nobody else gives as much detail electronically… (UK academic)

A further barrier involves selectivity in the use of ICTs. Many academics, professionals and students are strategic users of ICTs (Schwen & Hara, 2003; Smith et al, 2005; Kelly et al, 2007), matching their usage to perceptions of meeting their operational needs, irrespective of the degree of their ICT skills. This is relevant to another barrier, revolving around whether the CoP is task-based or practice based. A virtual learning community may be short-lived have a finite beginning and end, being task-based, established for a specific learning activity such as

a course or seminar. On the other hand, a practice-based or subject-based virtual CoP may develop more organically and be less transient (Fowler & Mayes, 1999)

A final issue involves the use of technology to bridge the geographical gap which can lead to misinterpretation of messages, as a lot of non-verbal cues can be missing from the communication (Gibson & Manuel, 2003; Cramton, 2001; Gannon-Leary, 1999). ICTs lack the richness of face-to-face interaction. Much anecdotal information features misinterpreted communication online, easily exaggerated in the absence of cues and feedback. (Trayner, Smith & Bettoni, 2006)

Organisations such as the UK National Health Service are increasingly using networked learning, e-learning platforms and blended learning but:

Working with other practitioners, I know that their computer skills are not necessarily 100%. … (UK academic)

They lack familiarity with systems … It means a new learning curve, but we are now in a society and a cultural and technological environment of constant change, so we just need to be able to engage with change in a way that doesn't feel like a constant step backwards (UK academic)

Critical success factors for virtual CoPs and virtual learning communities

One critical success factor (CSF) for a virtual CoP is the technology and its usability. Virtual CoPs need to make good use of Internet standard technologies such as listserv, bulletin boards, and accessible web technology. Moule's (2006) findings suggest that a virtual learning community will need to ensure participants have the technological provision and necessary IT skills to support mutual engagement (Wenger 1998). Difficulties with access and ICT skills in relation to online discussions and e-based learning are acknowledged in the existing international literature (Milstead & Nelson 1998, Andrusyszyn et al. 1999, Geibert 2000, Gillis et al. 2000, Hong et al. 2003).

Technology needs to be regarded as an accepted – and transparent – means of communication (Campbell & Uys 2007). The evolution of a CoP is reliant upon the effective communication of the members, most easily achieved through face-to-face meetings (Hinds & Wesiband, 2003; Raven, 2003; Wenger et al. 2002). Personal interactions are valuable in building CoPs and Broady-Preston and Felice (2006) demonstrate the creation of an electronic relationship between library users and information providers in the University of Malta, adopting a customer relationship management and communities of practice approach. This progressed from a physical to an electronic relationship and demonstrated the ability of the internet to function as a medium for managing relationships as well as a facilitator for interaction and communication (Broady-Preston et al 2006)

Communication, therefore, is another CSF and is fundamental in the development of trust and the community. Along with trust, communication allows the CoP to grow, change and achieve its objectives. Trust is built through continued interaction developing common values and a shared understanding (Gibson & Manuel, 2003; Amin & Roberts, 2006).

A third CSF involves CoP membership. Andrews and Schwarz (2002) have reported the benefits of identifying group members with prior knowledge of each other to help consolidate membership and develop trust

Fourthly, CoP members must have a sense of belonging, being an insider (Brown & Duguid 2002; Wegerif 1998), Trayner, Smith and Bettoni (2006) add that paying attention to cross-national and cross-cultural dimensions in international online communities adds to the

complexity, challenges and value in such an accomplishment. This is illustrated by the HSBC advertisements on television that identify different gestures which convey different meanings in different cultures when one is 'doing business' in a global context. From this follows on a fifth CSF, that there should be shared understanding. Consideration needs to be given to the influence of culture in the use of ICTs in the development of a community (Campbell & Uys 2007). Culture impacts on the ability of the members to develop a shared understanding and sub-groups of the community, based on these cultures can easily emerge. Shared repertoire may include developed routines, language, ways of working and stories within the practice of the community, generated through negotiating meaning (Wenger 1998). It is postulated that virtual learning communities with a brief existence may not have the longevity of engagement required to develop shared repertoire (Fowler & Mayes 1999). Identifying elements of shared repertoire proved problematic in Moule's (2006) analysis of the online environment, which lacked the richness that might be observed in a physically located CoP, where presentations of gestures, nuances, routines and stories are made manifest.

Another CSF involves having a sense of purpose. A virtual CoP must have a purpose and this purpose must be achievable via ICTs (Dube et al, 2005; Campbell & Uys 2007). A CSF which helps achieve this sense of purpose involves leadership which Stuckey and Smith (2004) have exemplified as sustaining a CoP through sensitivity in monitoring, regulating, maintaining boundaries and responding to change. As the community becomes more distributed the need for driving leadership becomes more important, (Chavis et al 1986; Gibson & Manuel, 2003). Attendant on this is the CSF of netiquette and the modelling of good practice and the way guidelines about conduct in a virtual CoP are put into practice by facilitators (Trayner, Smith & Bettoni 2006; Gannon-Leary 1999). This is especially important in the case of 'neo-apprentices' in virtual CoPs who may be wary about contributing because they feel what they have to say is not sufficiently worthy or weighty. Seeing other people 'flamed' or send abusive emails on virtual CoPs is likely to inhibit contributions from putative members.

Another CSF involves the CoPs usage of user-friendly language and what Trayner, Smith and Bettoni (2006) describe as the 'ecology' of communication modes and skills, or graceful ways of bringing people into conversations.

A final CSF revolves around time. Longevity of a CoP improves engagement, as mentioned in connection with task-based vs. practice based CoPs. Time is needed both for communication and to build up trust, rapport and a true sense of community (Trayner, Smith & Bettoni, 2006.

Table 1: Benefits, Barriers and CSFs

Benefits	Barriers	CSFs
• Enhanced learning environment • Synergies created • Capabilities extended to higher level • Knowledge sharing & learning • Gaining insights from each other • Deepening of knowledge, innovation & expertise • Cyclical, fluid knowledge development • Feeling of connection • Ongoing interactions • Assimilation into	• Perpetuation vs. change and diversity • Disciplinary differences • Culture of independence • Tacit knowledge • Transactive knowledge • Specialist language • Collegiality, strong physical community • Shifting membership, • Creating and maintaining information flow • No F2F to break the ice • Read-only participants (formerly lurkers) • Hidden identities,	• Good use of Internet standard technologies • Technological provision • ICT skills • Institutional acceptance of ICTs as communication media • Good communications • Trust • Common values • Shared understanding • Prior knowledge of membership • Sense of belonging • Cultural awareness • Sense of purpose

sociocultural practices • Neo-apprenticeship style of learning • Identity development and formation • Practice-based usage	adopted personas • Lack of trust – personal and institutional • Selectivity in ICT use • No body language, misinterpretations • Task-based usage	• Sensitivity in monitoring, regulating, facilitating • Netiquette • User-friendly language • Time to build up the CoP • Regular interaction • Good coordination to achieve regular but varied communication • Material resources or sponsorship to bolster and build up the community

Final comments

The potential import of virtual CoPs is recognised by increasing interest in Europe in networked learning and e-learning, as witnessed by the development of organisations engaged in studying and producing data on the topic, e.g. Eurostat, Eurydice, IEA, Eurobarometer, EC projects. Among the last-mentioned are "eLearning: Designing tomorrow's Education" (Commission of the European Communities, 2003) and "i2010: European Information Society for growth and employment" which was launched in June 2005 as a framework for addressing the main challenges and developments in the information society and media sectors up to 2010 (Commission of the European Communities, 2006). Another example is the LEONIE project that specifically indicates that one expected outcome to evolve between now and 2010 is the creation of learning communities. (Alfaro et al, 2006) The goals of the HELIOS Project (Horizontal E-Learning Integrated Observation System) include the "building of a systematic observation and foresighting platform on e-Learning at EU and national levels" (HELIOS 2007: 1). It stresses that virtual communities, even if they do not foresee learning as their main objective, could generate e-learning as a side effect. (Del Rio & Fischer 2007)

The recently published European Commission Green Paper (2007) is currently inviting views on its proposals for a European Research Area (ERA). The paper suggests that the ERA "progressively structure itself along the lines of a powerful web of research and innovation clusters. Their reach should be amplified through 'virtual research communities' created by pooling and integrating activities and resources from different locations in Europe and beyond…" (European Commission 2007: 9). It also suggests that virtual research communities can "constitute a powerful vehicle to ensure the inclusion of researchers and students from all around Europe and other countries." (European Commission 2007: 18). One of the questions it poses in its concluding remarks is one of interest to the authors: "How can the EU and Member States best stimulate the emergence of European and global virtual research communities, exploiting fully the potential of computing, information and communication infrastructures?" (European Commission 2007: 19).

The Internet offers the potential for access and interaction with a universally accessible, democratic and interactive hub of speedy, low-cost communications and resources connecting individuals, disciplines, departments and services.

We see ourselves as a world player in the development of the e-learning community. There is a lot of potential for development of community through the Internet. (UK academic)

*We are still a long way off from providing a satisfactory experience (*UK academic)

The existence of virtual CoPs such as discussion lists afford opportunities for collaboration which have been facilitated by networked technology such as e-mail, which many academics

use regularly (Ciolek, 2000). Discussion lists may serve as virtual CoPs since they provide for interested professionals/academics to engage in discussion and debate; give others the benefit of their experience, and often save themselves reinventing the wheel by finding out what others have done when faced with particular problems (Gannon-Leary, 1998). In academia there are a variety of these special interest groups exchanging messages on a range of topics.

In theory, the CoPs should add a new dimension to academic research and its communication. Mooted benefits of networking and communication include rendering physical location unimportant and isolation from the peer group less problematic when academics are scattered geographically or work in small institutions, since virtual CoPs can grow up based on interests rather than on physical proximity enabling collaborations, sharing of specialist interests and affording access to mentors and like-minded individuals (Schmitz and Fulk, 1991).

Among a group of people with a common interest in a topic, there is no natural hierarchy except the one which evolves from participation and 'natural' experts can emerge (Anderson et al, 1995). Enhanced access is afforded to information, academics may strengthen their command of their field of work and that work is made increasingly visible to others (Ciolek, 2000). CoP members share information, insight and advice and, in so doing, derive value from their interaction. Over time it is possible to develop a unique perspective on a topic in addition to a body of common knowledge, practices and approaches. While the concept of CoPs is not new, the development of the ICTs, combined with the need for more intentional, systematic management of knowledge means that electronic communications may afford an opportunity not only to manage knowledge as an asset but also to keep apace of change and core knowledge requirements.

Although the potential for virtual CoPs through e-mail discussion lists and discussion boards would seem enormous, the authors' recent experience in setting up and moderating such a list, coupled with the comments derived from academics trying to sustain discussion boards, suggests this potential is not being realised. The authors' experience was that the announcement of the introduction of a new list, along with its aims and scope, resulted in many would-be members from all over the world signing up and, by so doing, indicating an interest in the list theme but few of the signees subsequently made an active contribution. List members included international experts in the list topic, with much valuable experience which they could share with others so this lack of exchange of interaction was a matter of concern.

Many of the articles cited in this paper are from areas other than Europe – from the USA (Geibert, 2000; Gibson & Manuel, 2003; Hinds & Wesiband, 2003; Jarvenpaa & Leidner, 1999; Milstead & Nelson, 1998; Robey et al, 2000; Schrum, 1998), Canada (Andrusyszyn et al, 1999; Gillis et al, 2000) and Australia (Andrews & Schwarz, 2002; Campbell & Uys, 2007; Smith et al, 2005; Stacey et al, 2004). Fox (2005) comments on the fact the Internet is dominated by American-English and stresses the need for networked learning "to engage with the issue of languages and through that the issue of other cultures and communities." (Fox 2005: 108)

Recently Petersen (2007) from Denmark suggests that concepts of learning in communities of practice might be further developed and Wubbels (2007) from the Netherlands discussed the need for further research in this area. The authors would concur with this, given that networked learning and e-learning articles have a large diffusion around Europe, and would like to further identify and study CoPs and virtual learning communities across EU countries. What are the benefits, barriers and success stories in Europe? Have we been slower to take advantage of the potential of ICTs? Do Europeans display special characteristics which differentiate their use of electronic media, specifically CoPs, from that made by their counterparts in North America and Australia? Does the diversity of cultures and languages

militate against European academics engaging in CoPs to the same extent? It would appear from the literature that there is currently a lack of knowledge about CoPs in Europe, especially those associated with post tertiary and University education. One academic recognised potential benefits beyond those to himself:

If you're involved in distance learning you can easily become involved in on-line communities that revolve around your subject. There's a lot of benefit that could be gained by the HEI from that sort of involvement both in terms of student recruitment and in terms of world renown. (UK academic)

Another academic expanded on her own Utopian vision of a CoP as an updated version of the eighteenth century European 'salon' which provided a base for the discussion of social, artistic and scientific questions:

Scholarly exchange, the building up of research communities... people really becoming part of a research network in a very active way, even though they're thousands and thousands of miles apart… the democratising potential of that...recreates the conditions, almost, of a mass intellectual salon where people are able to argue and discuss, and be in contact (UK academic)

Remarks

[1] The quotations are from the authors' recent research with academics in the UK which, to date, has not been published elsewhere. The authors would like to thank contributors

[2] Currently the preferred term for online behaviour whereby the participant reads the postings of the participants in a virtual CoP but does not actively contribute to the debate is 'ROP' or 'read only participant'.

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