Empowering Knowledge Exchange and Innovation through the Communities of Practice Model (CoPM) in the ODL Environment

by

Prof. Marija Jakovljevic

School of Computing, College of Science, Engineering and Technology, UNISA, South Africa
jakovm1@unisa.ac.za

Abstract
The motivation for this research has been found in the increasing numbers of ill-prepared learners with inadequate study skills who are entering open distance learning (ODL) environments and performing their study tasks in socially isolated contexts. This leads to low throughput and a decline in learning and innovative outputs.
The purpose of this paper is to create a CoP model and examine its impact on the stimulation of innovation processes and knowledge sharing at the ODL institution of higher education in South Africa. The nature of this study demanded a qualitative research approach with informal individual interviews and journals' reports as methods of data collection. The study sample consisted of two CoP groups with five members in each group enrolled in two undergraduate modules at the ODL institution of higher education in South Africa.
Findings indicated a need for CoPs within the ODL environment with adequate monitoring and guidance that stimulate innovation and knowledge exchange.
Keywords: CoP model, ODL, knowledge exchange, innovation

Introduction

ODL in general characterizes online tools and infrastructure that are currently not well-designed to satisfy the needs of students with varying learning skills and experiences (Maor, 2003; Pitsoe & Maila, 2011). Research has revealed that there is a lack of a specific framework to guide learners' communities of practice (CoP) and the innovative knowledge exchange in ODL higher education (Bushney, Buckley, Jakovljevic, Majewski, 2013). A CoP group is formed when two or more individuals come together voluntarily and informally to share expertise or ideas and are passionate about a common venture (Wenger, 1998a,b; Wenger, McDermott, & Snyder, 2002).

The motivation for this research has been found in a need to develop a CoP model (CoPM) based on the principles of learning theories, ODL research and CoP theories and practice in higher education. Innovative practice and a multidisciplinary approach becomes a social need that requires urgent attention in higher educational institutions and ODL environments. Teaching-intensive institutions of higher education should be aware of a lack of appropriate models for building effective communities of practice as the main drivers for innovative knowledge exchange (South Africa, 1997: 9-91). This study is a part of Women in Research (WiR) longitudinal action research project that consists of six phases: developing a theoretical framework and criteria for CoPs; exploring students' preliminary attitudes towards CoPs; forming communities of practice pilot groups and implementing the CoP model; evaluating pilot CoPs groups; implementing the CoP model in the main action research study; evaluating and applying a CoP model (CoPM) to other groups.

The main purpose of this article is to create the CoP model and examine its application in the pilot study at the ODL institution of higher education in South Africa. Furthermore, the aim of this paper is to report on phase three of the Women in Research Project (WiR) project namely: forming pilot communities of practice under specific guidelines of the CoP model in order to empower learning and enhance innovative outcomes.
Based on the above discussion, the specific aims of this article are as follows:

1. Identify major components of the CoP model
2. Identify and discuss key aspects of the model in terms of its applicability for CoPs' groups in the ODL context.

To do this, the following research questions are set:

1. *What are the students' perceptions in terms of guidelines, allocated activities and roles within the model?*
2. *What are the major components of the CoP model and how do students perceive it's effectivess to knowledge sharing?*
3. *How does the CoP model contribute to empowering of learning and innovation in the open and distance learning environment?*

The theoretical framework will be presented in the next section, highlighting the theoretical pillars and innovative knowledge sharing within ODL environments. The descriptions of the CoP model will follow with its deployment and appropriateness for the ODL context.

Theoretical framework for communities of practice model in the ODL environment

Theoretical pillars for communities of practice

CoPs have been described as "groups of people informally bound together by shared expertise and passion for a joint enterprise" (Wenger & Snyder 2000: 139) with similar task responsibilities that solve authentic problems and promote interdisciplinary knowledge and practice across different groups (Johnson, 2001).

CoPs trace their roots in constructivism, sociocultural and socio-constructivist approaches to learning that involves collaboration, shared goals, cognitive tools and the role of instructor as a facilitator or coach (Vygotsky, 1978; Wertsch, 1991; Resnick, 1991; Ruey, 2010).CoPs support situated learning through apprenticeship, coaching, collaboration, multiple practices, and the articulation of learning skills, stories and technology (Brown, Collins & Duguid, 1989). Peer interaction, scaffolding, and modelling are important ways of facilitating individual cognitive growth and knowledge acquisition (Vygotsky, 1978; Pitsoe & Maila, 2011). Thus, these theories and perspectives present a basis for the growth of human competencies within CoPs.

Innovative knowledge sharing within communities of practice: Online technologies and barriers in the ODL environment

There are varieties of technologies at ODL contexts such as multimedia, video and audio conferencing, telephony, SMSs and MMS s via cell phones, discussion forums/chat facilities to support open and distance learning (Ferreira & Venter, 2011:86). However, "…the throughput rate of students is still unsatisfactory". Multiple barriers exist for knowledge sharing in current ODL contexts, for example, poor support services, institutional attitudes, a low opinion of communities of practice, missing CoP guidelines, teaching overload, limited or no management support and limited resources.

Eckert (2006) specifies that within CoPs knowledge development can be continuous, cyclical and fluid. Knowledge sharing and transfer depends on individual characteristics, experiences,

values, motivation, and beliefs (Borthick & Jones, 2000; Hsiu-Fen, 2007; Kehrwald, 2008). Wegner (2000:143-144) points out that managers identify potential CoPs, provide the infrastructure and use non-traditional methods to measure the value of CoP effectiveness. Schooling has become progressively marketized (Goodson, 2005) demanding innovative products. CoP members engage in developing new products through peer interaction and expert-to-apprentice interaction (Pan & Scarbrough, 1998).

Traditional teams vs. community of practice teams

Traditional teams and CoPs teams differ. Burk, (2005) indicates that traditional teams have deadlines and specific deliverables. CoP teams usually have longer life spans than traditional teams lasting as long as they have value to their members (Burk, 2005) in promoting interdisciplinary knowledge and practice. Thus, CoPs are self-organising systems based on the intrinsic value that membership brings into the action ((Wenger, et al, 2002). "Communities of practice teams possess different levels of expertise, fluid peripheral to centre movement that symbolizes the progression from being a novice to an expert…" (Johnson, 2001:1).

CoP teams have a sense of connectedness of shared passion derived from on-going interaction (Gannon-Leary & Fontainha, 2007). "CoPs are facilitated by an instructor or a CoP group leader (a moderator, coach or mentor), whose role is to act as a gentle guide or facilitator, that includes the instructor's duty of opening the community environment for discussion of goals, evaluations and peer evaluation and self-evaluation"(Bielaczyc & Collins, 1999).

Communities of practice model (CoPM) for ODL learning and teaching

In considering the purpose of this study, an in-depth research on the aspects related to the CoP model, its structure and deployment within the ODL field were emphasised.

The components of the CoP model

Figures 1a and 1b present the following key CoPM components:

Phases: Phase I: Foundation (domain, purpose, mission, vision, outcomes); Phase II: Planning (activities, technologies, communications, roles); Phase III: Pilot (deploying and testing the CoP model); Phase IV: Competence development (design of a charter, deliver events, performance measurements); Phase V: Sustainability (evolving community culture of learning and innovation); Phase VI: Evaluation and the way forward.

The Core Team: two facilitators/leaders for each CoP group. The researcher of this study played the role of the CoP leader/moderator and the member of the core team.

Roles: five rotating roles were assigned: the facilitator/leader, the learning specialist and content tutor; the administrator and critical reader, the researcher and innovator, the technical advisor.

Activities: A predefined set of activities were allocated for each role and open for additional activities and changes.

Time planning: The start time was manually entered. The end time was calculated through the software indicating the project advancement in terms of activities and phases.

Critical Performance Indicators (CPI) and *Assessment Criteria (AC)* were designed for each role and activity within the CoP phases.

CoP Phases	Group lead: Name	Core Group Names	Group Tasks	Group 1: Roles and Names	Group 2: Roles and Names	Activity No	Activities per Roles	Risks
				PHASE I				
PHASE I: Foundation (Domain, Purpose, Mission, Vision, Outcomes)	Maria Stella Melanie Clinton	Group lead: Name (Lecturer) Facilitator-Group 1: Facilitator-Group 2: Facilitator-Group 3: Facilitator-Group 4:	Task 1: Invite students Task 2 Prepare CoP initial setting Task 3 Prepare foundation: CoP benefits, vision, mision and goals	Facilitator/Leader-Group 1	Facilitator/Leader-Group 2	FP1A1 FP1A2 FP1A3 FP1A4	Initiate contacts and invite students to join Recruit core team members Initiate and facilitate a brainstorming session for CoP benefits, name and branding Identify and discuss tasks and activities within the CoP	
				Learning Specialist and content tutor Name:	Learning Specialist and content tutor Name:	LSP1A1 LSP1A2 LSP1A3 LSP1A4	Provoke insight into learning issues and the subject matter Use e-learning tools (eg. blogging) /PowerPoint to present online learning techniques Initiate a schedule for content issues and study requirements Plan online meetings and discussions/chat	
				Administrator and critical reader	Administrator and critical reader	ARP1A1 ARP1A2 ARP1A3 ARP1A4 ARP1A5	Conduct administration needs assesment Repare list of admin requirements in terms of the study matters Setting agendas for weekly meetings Prepare exam and assignment samples Prepare templates to improve writing skills and critical thinking	

Figure 1a: The CoP model (CoPM)

Planned CoP work in hours	Status: CoP Activities Start	Status: CoP Activities End	Aug: Week 1 / Week 2	AC No	Critical Performance Indicators
12.0	02/09/2013	09/09/2013	In progress	AC1: AC2:	The primary CoP purpose and specific needs are defined CoP activities, name,benefits and brading are defined and recorded The CoP report is compiled CoP roles and responsibilities are clearly defined
6.0	10/09/2013	16/09/2013	not started	AC3: AC4: AC5:	There is an evidence that regular interactions are planned There is an evidence that continuity (on daily basis) and depth of interactions are fulfilled The factors to improve knowledge sharing are identified
5.0	23/09/2013	30/09/2013	not started	AC6: AC7: AC8:	Records of weekly meetings exist Announcements are compiled Face-to-face meetings are planned A timeline for revision of chapters/assignments is compiled Agendas for meetings are prepared

Figure 1b: The CoP model (CoPM)

The CoP model deployment

The deployment of the model demanded intensive preparations such as, sending invitation letters to students, motivating and training facilitators/leader. The enthusiasm of the researcher for this study in synergy with the CoPM provided a point of departure for the learning endeavour. Modelling of innovative behaviour and a passion for knowledge exchange and sharing can inspire students who are usually divorced from innovation practice in ODL contexts.

The CoP deployment procedure

CoPs teams met online through a social media tool of their choice. They had to develop a web design project with the aim of solving a real-world problem. The facilitators formed the teams, led and managed meetings and recorded the progress. They were involved in assigning roles, activities, time frames and methods of communication and reporting. The facilitators organized online CoP meetings once a week for 10 weeks, with duration of 30 minutes per session. Learning activities were supported through the application of the CoP model.

Research design
This research can be described as a qualitative case study (Creswell, 1994; Merriam, 1998) as the learning experience of students is investigated relating to an event in a bounded context.

Profile of the CoP members
The study sample consisted of two CoP groups with five members in each group enrolled in two undergraduate programming modules at the ODL institution of higher education in South Africa. Participants presented a purposive convenient sample, as they were available and inexpensive to this study (Merriam, 1988).

Methods of data collection
The methodological triangulation was applied with two data gathering methods: informal individual interviews and the facilitators' and students' reports. Two CoP facilitators provided a feedback in a form of a *report* about the CoP model/guidelines in general. *Informal individual interviews* were performed over Skype and phone conversations with CoP facilitators. Facilitators compiled their reports during the model deployment. The final summary report was submitted at the end of the CoP deployment.

Students provided regular weekly reports to their facilitators. The students' responses in reports were used to determine their perceptions on the model, their innovative engagements, the scope of work, their willingness to share knowledge through varieties of communication channels. These continuous data gathering process contributed to the richness of the evidence.

Data analysis and assessment of trustworthiness
Analysis of the interview data and reports' data entailed the categorizing and tabulation of data in order to focus on the research questions of the study. Themes that were detected through the analysis of the data were segmented into categories and subcategories and were supported by evidence in the alignment with Creswell's guidelines (1994). The constant comparative method was applied to the gathered data (Merriam, 1998). The research phenomenon was embedded in a theoretical framework that contributed to the internal and external validity of this study. Researchers carried out the necessary preparations including clarification of prejudices and assumptions, and exploring the social context of the entire case.

Results: Evidence of the CoP model effectiveness
This section presents the results of qualitative analysis of data gathered from the facilitators and students reflecting their learning experience with a support of the CoP model. The following categories were derived:

a) An initiative of an inspiring facilitator to act as a driver for CoP that leads to the formation of the core group and maintaining the spirit of innovation.
b) Empowering of learning can flourish within a multidisciplinary CoP group in synergy with structured guidelines that allows guided self-monitoring dynamics.
c) A pre-defined set of roles and activities within the phases of the CoP model and critical performance indicators helped CoPs members with learning tasks.
d) The Cop groups kept innovation spirit high because of its multiple goals such as empowering learning, innovation and entrepreneurial skills.

Using comparative analysis, the researchers selected the relevant answers relating to the categories derived from each of the interview transcripts and comments from the reports and these are discussed in the following sections as evidence.

a) *An initiative of an inspiring individual acts as a driver for CoP that leads to the formation of the core group and maintaining spirit of innovation.*

Facilitator A (Group 1) report revealed: "the team members were inspired individually…it was necessary to keep continuous enthusiasm and the excitement of discovering new solutions…" Student A (Group 1) noted"…our facilitator was monitoring, reminding us, encouraging our activities and decision-making…"Student B (Group 2) noted: "thanks to our facilitator, the extent of our innovative spirit was high…he was demonstrating knowledge sharing, modelling and communication skills…"Facilitator B (Group 2) reported, " the core group helped us to manage and monitor all activities… a deep insight, empathy and incorporating technology were a key during the innovation process…"Student C (Group 1) noted:"brainstorming sessions were experienced as exciting and fun...our learning experience was reflected in simulating scenarios…often we used concept sketches, mind maps, experience mapping to investigate concepts…"

b) *Empowering of learning can flourish within a multidisciplinary CoP group in a synergy with structured guidelines that allows guided self-monitoring dynamics.*

The facilitator B (Group 2) reported in the interview: " structured guidelines within the CoP model encouraged us to do research so our learning process was enriched…the measuring and testing processes were missing due to lack of time and close supervision of the lecturer..." Student D (Group 2) commented, "The design was performed within six phases…we were excited during the exploration phase but not reaching the sustainability …" The facilitator A (Group 1) commented: "….we had a member from another module…he helped us through scaffolding and modelling to generate new ideas in web design…" Student C (Group 1) commented "To begin our journey into the world of innovation we had to use a structured tool …we were immersed in the high level of innovative activities as organizational aspects were clarified within the existing model…" Student B (Group 2) commented: "I have to accept that the innovation process was not always in its peak as it was difficult to find time for innovation activities…the model was used as a monitoring and a design mapping tool."

c) *A pre-defined set of roles and activities within the phases of the CoP model and critical performance indicators helped CoPs members with learning tasks.*

Student C (Group 2) noted: "In my opinion it was easier to learn when roles and activities are clearly defined…for example it was important for us to clarify administrative tasks, so we knew who was responsible to write minutes, who was responsible for sending invitations for meetings…a critical reader was responsible for accuracy of our documents …" The facilitator A (Group 1) commented, "The model provided a profile of tasks, activities, and a time frame with key performance indicators that our team followed with an accurate delivery."The facilitator B (Group 2) commented: "…"Different roles, tasks and activities helped us to visualise and to fullfil the learning outcomes. The facilitator A (Group 1) commented: "There is little reward for innovation in our institution… students are not trying hard enough because they are not motivated as they have to carry out current routine learning operations…the key performance indicators were used as a checklist for each activity..."

d) *The CoP groups kept innovation spirit high because of its multiple goals such as empowering learning, innovation and entrepreneurial skills.*

Facilitator B (Group 2) commented, "Innovations should have a clear time frame from an idea to the commercial outcome**…**it wasn't indicated in the model...However, a visible progress in our design work was available on a weekly basis at our regular online

brainstorming sessions…" Student B (Group 1) reported: "It is not enough to carry out the innovation… the ultimate goal of innovation is its application in practice… It is important that the innovation has an economic aspect and that it is financially viable…there was no sufficient time…" Facilitator A (Group 1) reported: …I think the innovation infrastructure at the institution is inadequate to support students in innovative activities..." Facilitator B (Group 2) reported: "Team members were inspired by opportunities to get entrepreneurial skills, expecting a commercial output…these expectations were encouraged and kept design and innovation spirit very high." Student A (Group 2) reported, "Through our model we were instilling a culture of research...the challenge was to motivate members to integrate research with learning requirements to pass exams." The next section gives answers to the research questions and interpretation of the results.

Discussion

The first research question seeks to *determine students' perceptions in terms of CoP guidelines/model*. The leader/facilitator contributed to the effective formation of groups and maintaining a spirit of innovation within the group. This is supported in the literature (Lave & Wenger, 1991) as CoPs are able to retain dynamics and evolving knowledge within a real-time process. Applying the model, it was possible to pay attention to individual differences such as personality, motivation, will, attention, character, creativity, and other important and significant human capacities (*in response to question 1*). Providing adequate support to students through the structured guidelines to become more connected and competitive is of increasing importance in ODL higher education.

The second research question attempts to define *key components of the model* such as phases, the roles, the core team, tasks, activities, risks, time frames, assessment criteria and key performance indicators. Students and facilitators felt that the CoP model with its components was an appropriate tool for effective learning since the organizational and administration matters were resolved and roles contributed to the clear task designation (*in response to question 2*).

In answer to the third question about *empowering learning and innovative ideas through the model* it can be said that every ODL institution requires a special infrastructure in enabling communities of practice. The fact that learners were involved in the generation and refinement of ideas within small communities of practice groups positively influenced their innovative skills. The evidence shows that students communicated within and across different groups that promoted interdisciplinary knowledge through scaffolding, and modelling. Evidence shows that students within CoP groups were involved in apprenticeship and coaching due to their motivation, varieties of shared experience and their values. The evidence shows that the innovation infrastructure and rewarding innovation need further attention. The CoP core group management is an important factor in the ability to innovate because the core team leaders have a great influence on the development of group vision and strategy to achieve it.The core group had an impact on keeping an innovative spirit high through interactivity, discussions, brainstorming and problem solving exercises, which were applied as tools for creativity (*in response to question 3*).

By comparing the findings it is possible to conclude that the CoP model and its implementation were adequate in promoting knowledge exchange and innovative engagement.The next section presents the most important conclusions and recommendations of this paper and remarks for further research.

Conclusions, limitations and further research

The implementation of the CoP model revealed new paths in the facilitation of learning in the ODL environment. The results strongly support the following general conclusions:

- An inspiring individual and the core group is a driving force that influnces the formation of the CoP providing a model of innovative behavior that contributes to a sustained desire for solving real-world problems and innovative learning.
- Critical performance indicators serve as a checklist for the fullfilment of activities, roles, goals and evalution metrics that asssit CoP team members with learning tasks.
- Innovative learning can be enhanced due to the multidisciplinary nature of the CoP groups and its multiple goals such as empowering learning, innovation and entrepreneurial skills.
- In any learning and innovative endeavour it is necessary to have proper tools and guidance in the form of a model. These altogether presents a baseline that provide an environment for free flow of ideas and allow continous concentration on the problems. The multiple and various routine tasks in ODL academic environments disrupt any innovation venture.
- The voluntary and spontaneous nature of CoPs teams can provide an ideal environment for fruitful ideas due to its tendency to inspire and attract a variety of students that work together in an ODL context.
- Forming CoP voluntary groups would help to set up mechanisms for the improvement of gross learning increments that depend on motivation, knowledge, skills, expertise, students' relations and cooperation and teamwork.

In conclusion, communities of practice in ODL context with appropriate guidelines holds great promise, particularly as a way of empowering students through innovative techniques and knowledge exchange during learning processes.

Contribution/originality and value-add: The findings of this study provide a solid theoretical basis and a building block for an integrated CoP framework in ODL higher education. This study identified several crucial issues essential to organize successful learning and empower innovation within communities of practice.The study suggests practical recommendations to ODL educationalists in order to empower students with innovation potential and learning performance by employing the CoPM relevant to global demands for knowledge exchange and sharing.The baseline of this study can be used for further research on a role of e-tutors and teaching assistants in CoPs and the application of the model in face-to-face communities of practice contexts.

Limitations: Time constraints were limitations in this study as the CoP groups could not complete their innovative ideas and all six phases due to the lack of an adequate CoP infrastrucure at the institution of higher education.

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