Chapter 11
Building a Faculty-Centric Virtual Community of Practice (vCoP) Within the Post-secondary Education Environment: A Systems Approach Framework

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Abstract This chapter describes the process used to design, develop and assess a faculty-centric virtual Community of Practice (vCoP) within the environment of post-secondary educational. The primary goals for developing a faculty-centric vCoP were to provide: on-demand, multi-modal learning opportunities for globally-distributed faculty with diverse abilities, a forum for faculty members to share their ideas and best practices, and a self-supported, sustainable and scalable learning community, while increasing social capital. To guide the development of the resulting community artifact, the systems approach model was applied (Dick in The systematic design of instruction. Pearson/Allyn and Bacon, Boston, 2005). Further guided by the empirical work of Chiu (Decis Support Syst 42(3):1872–1888, 2006) regarding knowledge sharing and the development of social capital in vCoPs, as well as the 21 typology elements outlined by Dubé (Interdiscip J Inf Knowl Manag 1(1):69–93, 2006), this study extends the understanding of effective vCoP implementations. In an ever-expanding realm of instruction and the digitization of instruction within post-secondary education, a supportive Community of Practice is deemed critical to the effective dissemination of skills, techniques and information. Thus, to address this gap, a faculty-centric vCoP development framework is proposed and examined in detail. This chapter provides a comprehensive literature review, presents a theoretical framework, discusses challenges and goals of a faculty-centric vCoP, explains the framework development methodology used, highlights key findings and discusses benefits and limitations of the findings. This chapter examines a suggested development framework and processes to develop a vCoP in the post-secondary educational setting with the goal of fostering knowledge creation and knowledge sharing among participants.

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11.1 Introduction and Literature Review

Regardless of the nature of an organization, be it corporate, higher education, or non-profit, the necessities of today's work environments dictate that employees are frequently located remotely from one another. In addition to geographically distributed individuals, functional teams, groups, and even physical workspaces are often scattered, and may be combined with temporal considerations that discourage or make physical contact impractical. Bridging organizational knowledge gaps through common databases and technology infrastructure are only partial solutions to creating unity of knowledge for such a dispersed organization.

Therefore, focus needs to be brought to how knowledge is shared, managed, and distributed from within a dispersed organization. Spontaneous and voluntary Communities of Practice (CoPs) are discussed by Wenger (1998b), while Lave and Wenger (1991) describe how members united to form a community of learning to overcome challenges. However, these early descriptions of such communities do not emphasize the potential limitations caused by significant temporal or geographic differences between knowledge sharing participants. The need to overcome such differences has inspired many organizations to look for digital alternatives to facilitate virtual teams (vTeams) and virtual Communities of Practice (vCoPs). Such virtualized knowledge sharing communities allow organizations to realize many of the benefits that traditional teams and CoPs share, including knowledge transfer, community building, and creating social capital (Lesser and Storck 2001), while simultaneously mitigating challenges of physical and temporal gaps.

While vCoP members may occasionally interact face-to-face, the primary means of communication are most often asynchronous and separated by distance. vCoPs are typically online social environments (Chiu et al. 2006) that allow members to communicate and share knowledge about common interests, goals and practices (Dubé et al. 2006). As a primarily virtual community (Koh et al. 2007), the central topic helps to define the purpose of the vCoP and provide it with a separate feeling of identity.

While contemporary vCoP implementations reply on electronic information systems, it is important to recognize that a vCoP might also employ more conventional communication technologies such as fax, telephone, email, newsgroups, or even physical mail. Furthermore, this chapter suggests that the ability to generate interpersonal bonds and a sense of community, recognized as important for conventional face-to-face meetings (Bourhis and Dubé 2010; Ardichvili 2008), can also be achieved within a vCoP when implemented using a strategic development framework. Therefore, face-to-face interaction is not a focal point for the vCoP strategies discussed within this chapter, rather the focus will be on a proposed

development framework that can be used to span the time and geographic distance that may necessitate the use of a vCoP.

The similarities between vCoPs and physical CoPs include the composition of members communicating thematic knowledge and experiences with one another. Members share the common goal of advancing specific objectives, ideas or practices that can span significant periods of time (Wenger 1998a). vCoPs and CoPs help members assimilate into organizational cultures (Chang et al. 2009), form workplace identities, gain skills and knowledge, establish and enhance motivations (Barab and Duffy 2000; Bradsher and Hagan 1995), and may serve as a motivating force for improving overall performance and effectiveness (Allen 2005).

The overall relationship between the effect on the individual member and the organization, however, is not as well established. The evidence presented by Wenger and Snyder (2000) indicate that the benefits realized from involvement in such communities positively influence performance, communication, and goal accomplishment. The aforementioned benefits of vCoPs and CoPs align well with knowledge sharing requirements that commonly occur in the post-secondary education environment.

11.2 Knowledge Sharing in Post-secondary Education Environments

With an ever-expanding depth and breadth of instruction, and the continual digitization of instruction within post-secondary education, a supportive community is often deemed critical to the effective dissemination of skills, techniques and information. While such organizational knowledge sharing can exist in physical communities, this chapter emphasizes the benefits of a virtual community. Specifically, a faculty-centric vCoP development and implementation approach is suggested. A vCoP can facilitate the following benefits to members: situate learning to their work environment, provide just-in-time solutions, and increase employee interaction. Furthermore, post-secondary education organizations can utilize vCoPs to provide the following advantages to faculty: self-help resources, motivation to consider embracing innovative tools and methods, and to a forum for sharing best practices.

Furthermore, from an organizational perspective, a vCoP also delivers several advantages including increased interaction among experts, increased communications between faculty and administrators, communications outside of face-to-face interactions, codification of practices and solutions to problems, and facilitations of formal and informal training which often foster innovation and cost reductions (Allen 2005). Such benefits are helpful to post-secondary educational organizations as they strive to overcome several possible constraints, including decreasing budgets, increasing performance expectations and demands on faculty time, and decreasing faculty development opportunities. Furthermore, a well-designed vCoP

could provide the motivation to integrate innovative technologies and instructional methodologies to support the various aspects of teaching and learning.

These benefits to individuals and organizations within the post-secondary educational environment emphasize the need to consider the use of vCoPs. As the implementation of a successful vCoP has not been exhaustively explored in research, this gap provided the motivation to define a detailed vCoP development framework. This framework is designed to allow organizations with limited resources to align their vCoP development efforts with best practices to better ensure successful implementations.

11.3 Methodology

In response to Bond and Lockee (2014), who suggest a more cyclical approach to vCoP development, we suggest a modified development framework considering the natively iterative nature of the systems approach model (Dick et al. 2005). Thus, this chapter extends the recommendations and steps outlined by Bond and Lockee (2014), in addition to applying the systems approach model to an organizational knowledge-sharing network. This model was considered ideal because many post-secondary education institutions are already familiar with its foundational principles. The preceding literature review was used to formulate the development framework, with an ongoing emphasis on building community and enhancing social capital.

In alignment with the systems approach model (Dick et al. 2005), the proposed vCoP development framework suggests iterative steps that can, and should, be revisited as the implementation progresses. The primary phases of the model consist of planning, development, operation and evaluation. The planning phase includes goal development, analysis of organizational characteristics, analysis of member characteristics and defining objectives. The development phase consists of establishing benchmarks and measurements, developing content and collaboration strategies and developing and seeding content. The operations phase refers to the continued and self-sustained community and its iterations. The ongoing assessment phase includes both formative and summative assessments necessary for continued improvement. While the operation phase informs the formative and summative assessments, it is not exhaustively described or examined as it is not within the scope of the development framework. These phases are visualized in the following model (see Fig. 11.1).

Within the four distinct phases, the vCoP development framework consists of nine distinct stages. It should be noted that although the framework includes nine stages, individual organizations may choose to implement only specific stages based on their needs and constraints. The development framework stages are described in the following sections.

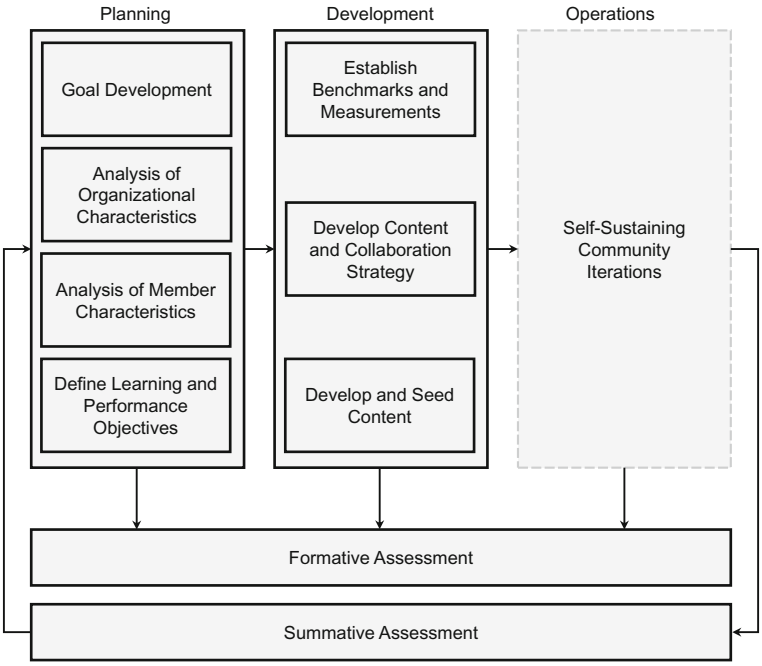

Fig. 11.1 vCoP development framework

11.3.1 Stage 1: Goal Development

The first stage of the vCoP development framework includes three distinct steps. The first step is to determine if a vCoP is the most appropriate method to foster and share knowledge within a particular organization. The second step is to define the purpose and establish executive support. The third step is to clearly define and develop goals for the planned vCoP creation or improvement initiative. In regards to a vCoP improvement project, the third step evaluates the performance gaps of any existing knowledge sharing networks to ascertain new goals. This is in alignment with the first stage of the systems approach model (Dick et al. 2005), which compares actual and perceived participant needs to establish goals.

While a team generally has a superordinate goal, a CoP is driven by parallel or common goals (Allen 2005). This distinction also applies with virtual participants, as one important distinction between a vTeam and a vCoP is that vTeams have interdependent performance goals, while vCoPs are based on a shared goal (Ardichvili 2008). These subtle distinctions are essential, and will ultimately determine the most appropriate implementation approach. Furthermore, in a team, cooperation is often mandatory and essential for success, while in a community, participation generally is voluntary and collegial. By determining where a suggested vCoP goal plots on a goal continuum, ranging from collegial to essential, the determination to implement a team or a community can be made.

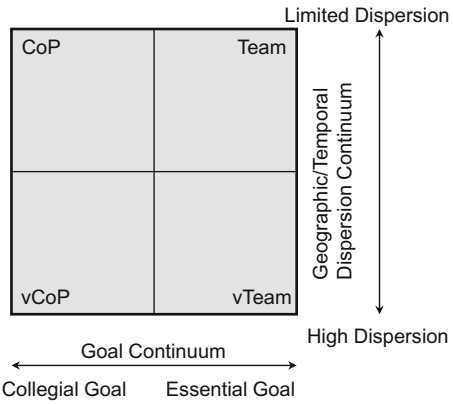

Fig. 11.2 Organizational knowledge sharing network decision matrix

In addition to the goal continuum, the amount of geographic or temporal distribution of members will impact the decision to form a virtual or physical group. The distinctions between a team and community, as well as that of a virtual or physical group, are not necessarily binary. Figure 11.2 presents a matrix with both dimensions on perpendicular axes to help determine the ideal knowledge sharing network implementation for an organization. Key stakeholders should collectively plot their expectations for each of these attributes for a new group, while current members of an established group should evaluate where their team or community is positioned. The proposed or existing placement within one of the four quadrants will determine the best approach for developing or expanding an organizational knowledge sharing network. If the results of this step indicate that a vCoP is not the optimal solution, stakeholders should pursue information regarding implementation strategies for their relevant quadrant. This chapter continues with the assumption that a vCoP implementation is the warranted approach.

Upon making the determination of the appropriate knowledge sharing network strategy for an organization, the second step of the first stage is to define the purpose of the vCoP, as well as to identify the appropriate sponsors and champions. This critical step is essential to any technology implementation (Baccarini 1999).

The purpose of an organizational vCoP spans from being operational to strategic (Denning 1998). However, vCoPs tend to have greater success if implemented in alignment with an existing organizational mission as this may reduce challenges related to uncertainty (Dubé et al. 2006). When defining the purpose of the vCoP, attention should be given to the elements that shifted the decision to form a vCoP in the preceding step. This is particularly essential for groups that plot on or near a quadrant boundary in step one of the goal development stage. Furthermore, this process should clearly state the needs for an organizational knowledge sharing network and why the vCoP approach is superior to other knowledge sharing efforts.

Upon defining the clear purpose of the vCoP initiative, it is essential to gather executive support. As with other formal projects and technology implementations, the success of a vCoP development effort can be positively influenced through the

support of a champion and sponsor. Such a support can come from either an administrator or an executive committee who are empowered to ensure that sufficient resources are available for the vCoP development effort. While sponsors and champions advocate for the vCoP (Crawford and Brett 2001), if the virtual community is being created external to a formal organization framework, the initial members may themselves serve as sponsors and champions, thus the establishment of clear purpose may be sufficient.

Upon defining the vCoP purpose and identifying executive support, the final step of the first stage involves establishing and defining the fundamental goals that shape the subsequent vCoP development stages. Thus, identifying the knowledge gaps and setting appropriate goals to address these gaps is essential to the first stage of the vCoP development model. These goals should identify skills, knowledge and attitudes that are to be achieved by the community. Brainstorming sessions, stakeholder discussions, or personal interviews can be utilized to generate goals for a new vCoP. Alternately, for an existing vCoP, Ríos et al. (2009) suggest that interview and surveys of experts and administrators can be used to define vCoP goals. These interviews and discussions with prospective participants can be facilitated using various synchronous and asynchronous tools. These community goals will help establish the scope of the subsequent analysis stages.

11.3.2 Stage 2: Analysis of Organizational Characteristics

The second stage of the vCoP development framework involves performing an in-depth analysis that will ultimately inform the subsequent stages and phases. More specifically, this stage should examine constraints and opportunities within the organizational context, as well as define requirements and specifications. Such an analysis has been shown to directly impact success (Dvir et al. 2003).

This stage requires an analysis of the organizational and technological context of the institution hosting the vCoP. The organizational context can determine how the vCoP aligns with an existing organization, specifically through the identification of the creation process, boundaries, environment, organizational slack, degree of institutionalized formalism and leadership. The technological context addresses the technological requirements of the as well as the degree of reliance on technology (Dubé et al. 2006).

One of the essential structuring characteristics of a vCoP is the identification of the vCoP leadership (Bourhis et al. 2005). Specifically, the creation of a vCoP can occur organically or be intentionally fostered through organizational leadership (Fontaine 2001). Specifically, Fontaine (2001) identifies two types of community leadership roles: community leaders and sponsors. While an organically developed vCoP may be successful, the proposed vCoP development framework assumes an intentionally structured and formal development process.

As organizations and communities often encompass internal and external boundaries, these should be identified and examined. For instance, a vCoP may be

developed to foster knowledge sharing among faculty members in different departments, therefore spanning an internal boundary, or cross multiple institutions, consequently spanning external boundaries. While vCoP implementations can inherently cultivate knowledge sharing across internal and external boundaries, the ability to establish community trust may become more difficult as boundaries are crossed (Wenger et al. 2002).

In addition to understanding the extent of the existing boundaries, the organizational environment and culture should be examined. Cothrel and Williams (1999) suggest that the organizational environment may have a facilitating, neutral or hostile attitude toward the establishment of a vCoP. Understanding the environment of an organization allows subsequent design steps to address associated risk. While Dubé et al. (2006) consider this as a single vCoP typology item; Hara et al. (2009) expand this single typology item to independently examine the organizational knowledge sharing culture and organizational sponsorship. A comparison of the strengths of the project sponsor and project champion, as identified in the first stage of the framework, with the risks of the organizational environment and culture is essential when planning the vCoP implementation.

The available resources will also impact the scope of the vCoP development. If an organization has limited resources to devote toward a vCoP implementation, it may be beneficial to limit the scope or plan to leverage external resources to ensure success. However, such constraints may impact the potential success as the purpose or goals may no longer be met. The availability of resources could also be impacted by the perceived legitimacy of the vCoP implementation. Dubé et al. (2006) state that the degree of institutionalized formalism has been shown to be an essential component of the success of a vCoP. Thus, the sponsor and champion role becomes essential toward impacting the legitimacy of the vCoP development.

Finally, consideration should be given to the leadership role of the vCoP. Specifically, a vCoP may utilize an organic and continuously negotiated leadership structure or opt for a clearly assigned leadership and governance model. Institutional legitimacy, culture and boundaries will influence these important leadership considerations.

In addition to the context of organizational structure, the technology capacity and readiness of the organization must also be considered. Specifically, the degree of reliance on technology as well as the technological requirements should be clearly defined.

Whereas some vCoP implementations may provide most interactions through a virtual environment, other vCoP implementations may utilize some non-virtual interaction. This is not unusual as some non-virtual interaction has been shown to strengthen the effectiveness of virtual communities (Hildreth et al. 2000; Dubé et al. 2006). Understanding the degree of reliance on technology and physical distances will influence the design considerations. Thus, this step confirms the necessity of a vCoP versus other knowledge sharing network options.

Additionally, the availability and access to various technologies can influence the capabilities of a vCoP. For instance, a high degree of technological variety could allow synchronous and asynchronous interaction, document storage, and

collaborative document sharing. Such flexibility could empower community members to develop and share knowledge through a variety of techniques. However, a high degree of technological capability may also overwhelm and frustrate community participants who prefer simplicity.

In addition to understanding the organizational context, the individual membership characteristics must also be considered. Thus, the next stage of the development framework extends the analysis to individual members.

11.3.3 Stage 3: Member Characteristics

In addition to performing an analysis of the organizational context, the individual vCoP membership context also impacts important design considerations. Such context includes the membership quantity, geographic dispersion, selection processes, enrollment processes, experience, stability, technology literacy, cultural diversity and relevance. As this development framework is an iterative process, the results of this stage may warrant changes to the findings of the previous stages.

One of the primary member characteristics is the projected quantity of vCoP members. Membership levels can be similar to small groups, departments, organizations, or encompass global communities of practitioners. The projected size will further impact the vCoP organization and required technology resources. As participation metrics will likely need to be estimated, it is essential to determine possible maximum number of participants in order to facilitate planning concerning the organizational and technological scalability.

Once the membership sizes has been estimated, the geographic and temporal dispersion of members should be examined as these can impact the complexity and success of a vCoP. Specifically, temporal dispersion complicates the ability to provide a synchronous community. Furthermore, large geographic dispersion creates psychological distance between members and makes in-person collaboration difficult (Dubé et al. 2006). This metric, and its analysis, will facilitate the determination of the technology specifications and leadership decisions. Once more, the iterative nature of the development model may necessitate revisiting prior stages as such metrics are established.

Another consideration concerning membership is the selection, or inclusivity, threshold. The potential vCoP inclusivity can range on a spectrum between open and closed. Specially, an open vCoP may encourage participation with anyone that can access the community, while closed membership selection may require participants to be part of an existing team, department or organization (Dubé et al. 2006).

Additionally, the membership enrollment process will impact goals related to the vCoP size, as well as that of active participation. Member enrollment may consist of voluntary, encouraged, compulsory, or mixed participation. Motivation to participate is generally greatest for voluntary participants and weakest for mandatory participants (Mitchell 2002).

The members of a newly formed vCoP tend to fall into one of three groups, (1) those that may already have existing relationships, (2) those that may already have virtual relationships, or (3) those that may have no existing relationships. As some vCoPs extend existing relationships from other virtual or physical communities, such groups can apply existing norms, roles and legitimacy to a new community. In addition to the existing communities, individuals may have existing experience with other virtual communities, allowing them to quickly feel comfortable in such environments.

The permanence of the community will be a further influence to the success of a vCoP. Organizations that experience high employee turnover may need to devote a significant amount of resources to adapting and integrating new community members, instead of furthering social capital. Furthermore, open vCoP models tend to provide more stability as the membership is tied to an individual not an individual's relationship with an organization (Dubé et al. 2006).

Technological literacy, or technology self-efficacy, of the participants may impact the willingness to adopt a new technology such as those often found in a vCoP. Thus, a clear understanding of the technological literacy of the community will be essential to designing a successful vCoP that does not overwhelm novice members or frustrate more experienced members who may feel limited by the technology.

Cultural diversity is another important consideration that should be addressed during the design process (Dubé et al. 2006). Diverse cultural perspectives based on national, organizational and professional backgrounds provide great benefits to any community, such as incorporating different contexts and unique existing knowledge. However, there are significant challenges that would need to be addressed, such as potential language barriers and unfamiliar communication norms.

Community goal selection can also influence the success of a vCoP. For instance, community members may find immediate benefits when the goal topics align closely with existing organizational themes. The selected topics should provide value to both the hosting organization as well as the participating individual (McDermott 2000; Dubé et al. 2006). An early understanding of topic preferences will greatly inform subsequent stages concerning vCoP content strategy and development.

To address all of the aforementioned factors, it is suggested that twenty-three common vCoP typology elements, comprised of the twenty-one Dubé et al. (2006) elements, in addition to two elements established by Hara et al. (2009), be examined to understand the impact of organizational and member characteristics on the vCoP development effort.

11.3.4 Stage 4: Define Objectives

This stage of the vCoP development process requires that the community goals be expanded to specific knowledge sharing, community building and performance

objectives. Specific and measurable objectives should be developed for each community goal. The starting point of this stage involves distilling the results of the brainstorming sessions, stakeholder discussions or personal interviews conducted in the first stage of the vCoP development framework. Specifically, the results of these sessions and interviews should be converted into objectives that are specific, measurable, assignable, and realistic and have a defined implementation time frame (Doran 1981). Through the establishment of clear and measurable objectives, the subsequent development of evaluation metrics is simplified (Baccarini 1999).

Development of clear and measurable objectives is accomplished by systematically deconstructing each community goal into smaller, more easily measured objectives. It may be important to distinguish between each of the objectives developed through this process as each might require a different implementation and support strategy. Objectives typically consist of information or acquired knowledge that is relevant to the overarching goal, and can be further clarified into additional objectives that focus specifically on acquired skills or tasks to be accomplished.

Regardless of the disposition of each objective (learning or performance), all objectives should be written to adhere to the SMART philosophy of objective construction. This is to say that each objective should be Specific, Measurable, Achievable, Realistic and Time bound (Doran 1981). A review of each objective should be conducted, and each objective that does not meet the SMART criteria should be rewritten until all stakeholders agree that each objective aligns with its respective vCoP goal.

The ABCD process, an alternative to SMART, also helps break down the construction of objectives by determining the Audience, Behavior, Condition and Degree necessary for creating clear learning and performance objectives (Reiser and Dick (1996). Using ABCD, the audience should be evaluated as either the entire, or a specific subset, of the vCoP. Next, the behavior should intelligibly define the exact action or knowledge required for the completion of the objective. A condition should be established to narrow the focus of each objective, making it both realistic and time bound. Finally, the degree should establish the measurement for an objective. As with the SMART criteria, objectives should be rewritten until all of the ABCD criteria are met for each vCoP goal. An organization should select and utilize the most familiar systematic objective development process (e.g., SMART, ABCD).

Through the development of well-defined learning and performance objectives, stakeholder expectations can be managed through documentation and communication, and the vCoP can be better evaluated for success during the subsequent evaluation phase. As with prior steps, the creation of objectives may reveal that some of the initial definitions, sponsors, champions, goals, community characteristics, and member characteristics may need to be refined.

11.3.5 Stage 5: Establish Benchmarks and Measurements

The purpose of this stage of the development framework is to ensure that an organization can accurately assess incoming skills and knowledge, as well as, inform the continued development of vCoP members and leaders. This process continues throughout the duration of the vCoP to allow for continuously improved alignment with the ongoing needs of the members. The establishment of benchmarks and measurement strategies may indicate the need to revisit the learning and performance objectives defined in stage four.

To establish knowledge benchmarks, which will then inform the content development and subsequent measurements of success, it is suggested that a focus group of potential vCoP members from a variety of contexts be established and assessed. This sample will allow potential objectives to be identified to see if any have already been met and thus will not need to be focused upon. Any unmet objectives will need to be further assessed to determine the members' degree of previous mastery. The results of these assessments help direct the development of content for the vCoP and inform the definition of the ongoing measurements to evaluate the success of the vCoP.

Embracing the iterative nature of the systematic model, such ongoing, periodic assessments should be used to identify areas of vCoP performance that are deficient and need to be revisited. It is often the case that when one learning objective is not being met, there may be problems with the degree of mastery of preceding learning objectives.

Methods for conducting the initial assessments may include, but are not limited to: (1) focus groups representing cross sections of potential vCoP members and leaders, (2) surveys, (3) questionnaires, (4) use cases, (5) anecdotal evidence, (6) facilitated leader and stakeholder discussions, and (7) recommendations from previous projects or studies.

Samples of ongoing, periodic formative evaluations may include, but are not limited to: (1) member satisfaction surveys, (2) measuring engagement and activity levels, (3) informal member-based rating systems, (4) guided practice sessions, (5) evaluated practice sessions, (6) use case scenarios, and (7) solicited or unsolicited reports of application of concepts and skills in their relevant fields.

It is important to note that the objectives are not meant to be restrictive or overly rigid, and changes may be necessary to keep the vCoP on track with the ultimate goals. This iterative formative evaluation process serves to ensure that the vCoP remains relevant, engaging and beneficial to the members.

11.3.6 Stage 6: Develop a Content and Collaboration Strategy

The second stage within the vCoP development phase is the sixth stage of the vCoP development framework. The focus of this stage is on developing an appropriate and relevant content strategy based on the collegial goals and objectives, the newly established benchmarks and evaluation tools, and the dynamic needs of vCoP leaders and members.

One of the greatest challenges within a community of practice is encouraging members to contribute to the shared knowledge of the community (Chiu et al. 2006). The social exchanges and shared knowledge help to sustain a virtual community, so encouraging these interactions is vital to the success of a community (Chiu et al. 2006). Engagement building research reveals that higher levels of social capital increase the engagement and contribution levels of the organization members, which in turn increases the overall creation of value within the organization as well as the potential for innovation (Nahapiet and Ghoshal 1998; Tsai and Ghoshal 1998). A reciprocal effect is that involvement in a community of practice also increases social capital (Kline and Alex-Brown 2013; Lesser and Prusak 1999). The following section defines social capital, describes the dimensions of social capital and how the facets of social capital influence community members' motivation to share knowledge, and explores the effect that being part of a community of practice has on social capital.

Halpern (2005) provides the following eloquent description of the concept of social capital:

> Societies are not composed of atomized individuals. People are connected with one another through intermediate social structures – webs of association and shared understandings of how to behave. This social fabric greatly affects with whom, and how, we interact and cooperate. It is this everyday fabric of connection and tacit cooperation that the concept of social capital in intended to capture. (p. 3)

Nahapiet and Ghoshal (1998) extend the definition of social capital to also include "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possess by an individual or social unit" (p. 243). At the most basic level, social capital theory states that members within a network of relationships, as well as the network as a whole, gain benefits from being part of the network that otherwise would not be possible (Kline and Alex-Brown 2013). Thus, benefits of a vCoP include access to the wealth of shared knowledge, open communication between like-minded individuals, and the opportunity for innovation within the community.

To explore how social capital might influence the sharing of knowledge within a professional virtual community, Chiu et al. (2006) examined three closely interrelated dimensions of social capital: structural, relational and cognitive. These dimensions were originally defined by Nahapiet and Ghoshal (1998). Chiu et al. (2006) describe the manifestations of each dimension as, "the structural dimension of social capital is manifested as social interaction ties, the relational dimension is

manifested as trust, norms of reciprocity, and identification, and the cognitive dimension is manifested as shared vision and shared language" (p. 1873). They focused on the how each of these facets of social capital influence the amount of knowledge shared within a virtual community as well as the quality of that knowledge. Their research revealed that these facets did have an impact on the quantity or the quality of the knowledge that was shared.

Kline and Alex-Brown (2013) suggest that being an active member of a community of practice can increase social capital through participant engagement within the community. They share that the key to increasing engagement in the community is through the development and implementation of engaging activities. Furthermore, they suggest that the CANFA model (Kline and Barker 2012) may be used to create engaging activities through, "*collaboration, application, negotiation, facilitation and active-practice*" (Kline and Alex-Brown 2013, p. 286). Specifically, "CANFA prescribes that activities need to be *collaborative* between participants; *apply* to the work they are performing; *negotiate* the outcomes and products of the community; structure *facilitation* into the community, and focus on *active-role participation* at the workplace" (p. 289). Having members of a CoP participate in engaging activities enhances their social connections, which in turn increases their social capital.

A content and collaboration strategy should also be developed to leverage the reciprocal relationship between social capital and participation in a vCoP, by using the vCoP as a facilitated platform for members to share knowledge and participate in collaborative activities. This will help to expand and strengthen the members' social connections and increase their social capital, which in turn leads to greater knowledge sharing.

11.3.7 Stage 7: Develop and Seed Content

A critical and particularly valuable period for a vCoP is immediately after its launch. Without a critical mass of community engagement or knowledge sharing, the new vCoP may not offer members enough of a participation incentive or perceived value to engage. Thus, a new vCoP could benefit from the seeding of information and resources. It has been shown that seeding encourages members to generate associated content to what is already available (Solomon and Wash 2012). By providing a reason for participants to begin discussions around specific topics, seeded content can be a catalyst for engagement.

Effective content seeding requires a content strategy to be developed and catalyst content elements to be developed and implemented prior to the vCoP launch. This strategy serves to pre-populate the vCoP, thus making it a valuable resource at launch without requiring substantial member contributions to be relevant. Xu et al. (2006, p. 31) describe the need for seeding in their vCoP for educators example, "Most of new teachers came to the forums for solving their problems and looking to help. Before any new teachers started to contribute, they had to be convinced that this was the right place to do so. So the further [*sic*] system should not start from an

empty skeleton." In addition to selecting and developing catalyst content, it is essential to determine when and how to most effectively expose or release content to the vCoP members.

The social nature and community-generated direction of a vCoP requires additional considerations to those of more formally produced projects. Therefore the design context of a vCoP demands that the roles of design and leadership be evolved in order to encourage active participation and create a hospitable environment (Hagen and MacFarlane 2008). This production evolution should include limiting the development and deployment to strategic content and avoiding the tendency to differentiate between the ideas generated by developers and those of community members. Consequently, it is important to seek out and identify specific areas and opportunities for seeding that spark the greater levels of knowledge reciprocity. While the seeding process is most critical during the early stages of vCoP development, it can also be applied to foster continued relevance and usefulness for community members (Hagen and MacFarlane 2008).

Seeding content can be implemented in a variety of methods including producing content, reusing existing content, integrating third party content, or any other means of injecting relevant information where additional discussion or content creation on the part of vCoP members is desired. This last point is crucial when considering seeding any content into a vCoP. The strategic use of seeding should be included into the development phase of the overall vCoP design, and agreed upon by all appropriate stakeholders, as there can be potential negative side effects to this strategy. One of the significant concerns associated with seeding is that this technique has been shown to decrease the overall contributions of unstructured content when compared to new community members being presented with a blank canvas (Solomon and Wash 2012). Therefore, it is important to purposefully employ this tactic with content that is not necessarily dependent on the creation of original thought or member solutions, but is designed to trigger initial engagement and encourage knowledge sharing on specific topics or objectives.

11.3.8 Stage 8: Conduct Formative Evaluations

Throughout the development process and following an initial launch formative evaluations are encouraged as the results from such evaluations will allow appropriate and necessary modifications prior to active community participation. There are four types of formative evaluation that should be performed during the vCoP development and immediately after the initial launch. These types are proactive, clarificative, interactive and monitoring. The proactive evaluation is conducted at the onset of the project and formalizes the steps completed earlier in stages. However, a second *ex ante* formative evaluation is clarificative. The clarificative evaluation occurs during the development phase of the project and will explicitly define the theory of change that applies to the project (Owen and Rogers 1999). Examples of this approach include, but are not limited to, the development of a logframe matrix

(Crawford and Bryce 2003) or the establishment of program logic (Cooksy et al. 2001). During the operations phase of the vCoP both interactive and monitoring evaluations should be conducted (Boulmetis and Dutwin 2005). Interactive formative evaluations can consist of additional focus groups or semi-structured interviews with stakeholders. Formative evaluations conducted through monitoring can consist of surveys, observations and other system generated metrics.

As with previous stages of the vCoP development framework, the results of this stage should not only inform the subsequent, but also the preceding stages.

11.3.9 Stage 9: Summative Evaluation

This final stage evaluates the overall success of the community and informs incremental improvements and redesigns. Unlike the *ex ante* formative evaluation, the *post ante* summative evaluations occur after each community iteration.

There are multiple approaches toward conducting a summative evaluation including positivist, interpretist and critical methodologies. The positivist approach allows for the quantitative evaluation of the system based on performance benchmarks set by the objectives established earlier. An example of a positivist evaluation is to determine if the vCoP is meeting the estimated participation metrics as defined in a previously developed objective. The evaluation of such quantitative measures allows the vCoP leadership to determine if the goals have been met, and respond accordingly if not. However, as quantitative measures alone may not be the only indicators of success, additional approaches are also suggested. The interpretist approach suggests that the evaluator assess the perspectives, experiences and expectations of each of the system stakeholders through qualitative evaluation, such as interviews and focus groups (Potter 2006). An example of this may reveal that the vCoP is not meeting participant expectations, while the qualitative goals are met. Finally, the critical approach suggests that the social, political and historical context of the vCoP development and implementation be considered for their impact and constraints on the system (Klecun and Cornford 2005). An example of this may reveal that the interpretist findings were largely based on assumptions or that hidden objectives exist and have not been met. While one of these approaches may be sufficient to evaluate the success of the vCoP, a combination of all three approaches will provide the greatest insight into whether the vCoP is meeting the prescribed goals, providing unforeseen benefits, or is in need of continuous improvement.

11.4 Limitations and Future Research

While the proposed vCoP development framework can inform a successful vCoP launch, the development framework has not yet been fully validated through a comprehensive evaluation process consisting of all nine stages. Thus, a significant

limitation of the vCoP development framework is a lack of summative evaluation results for an actual implementation. Future research examining the validity of the development framework is suggested. Another limitation of the proposed vCoP development framework is that it was examined only in the context of a post-secondary education environment. Future research will need to assess how the vCoP development framework assists with the implementations in the context of varying cultures, environments and goals. Doing so will help determine limitations of the vCoP development framework and ultimately lead to modifications to ensure generalizability.

Another limitation is that an understanding of the value of each step toward overall success has yet to be established. Understanding which steps are critical success factors would allow resource-constrained institutions to maximize their investment. While a post-secondary educational institution with prior community-building experience and management resources could absorb the steps of the development framework, institutions with limited resources may need to consider partnering with other institutions, limiting the scope, or finding external resources to ensure a successful implementation. Thus, a final limitation is the significant resource investment required to complete the nine-stage development framework. As some institutions of post-secondary education may lack the resources necessary to fully implement the recommended framework, additional suggestions for future research include an identification of the essential development stages for vCoP success, an identification of stages that can be distilled or even eliminated to meet institutional constraints, and an empirical evaluation of the proposed framework.

11.5 Conclusion

This chapter provides a comprehensive literature review, presents a theoretical development framework, discusses challenges and goals of a faculty-centric vCoP, suggests benefits to post-secondary educational institutions, presents key findings and discusses benefits and limitations of these findings. Specifically, this chapter suggests a nine-stage iterative implementation framework to facilitate the successful development of vCoPs. The proposed framework emphasizes the importance of completing a detailed planning phase prior to beginning the development phase. Finally, evaluation strategies are suggested for continuous improvement.

This chapter provides a comprehensive literature review, a decision matrix to aid in identifying the optimal type of knowledge sharing network and theoretically-based vCoP development framework. Specifically, this chapter suggests a nine-stage iterative implementation framework to facilitate the successful development of vCoPs. The proposed framework emphasizes the importance of completing a detailed planning phase prior to beginning the development phase. The possible challenges, goals, benefits and ongoing evaluation strategies of a

faculty-centric vCoP are also discussed. This chapter concludes by emphasizing the need for an examination of the proposed framework in practice.

The use of the proposed vCoP development framework could provide immediate and practical benefits to contemporary organizations, because employees are often separated by physical and temporal distance. Thus, bridging organizational knowledge gaps and building a sense of community has become an ongoing challenge. The implementation of a vCoP helps to overcome this challenge, while enhancing communication, building social capital, increasing shared knowledge, and fostering innovation. Furthermore, a vCoP in the post-secondary education environment provides the opportunity for faculty to have an open forum for sharing ideas and best practices, while building a self-supported and sustainable learning community.

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