Knowledge sharing and organizational change in higher education

Introduction

Higher education institutions can obtain significant benefits from the use of organizational learning concepts. University managers and academics can apply organizational learning concepts to analyze the external environment, assess organizational capabilities, and develop and implement strategies to enhance institutional effectiveness. Organizational learning practices can assist leaders in developing responses to external accountability pressures, as well as for addressing organizational performance challenges such as student drop-out rates or rising costs (Kezar, 2005; Dill, 1999). Organizational learning can expand the breadth and complexity of organizational mental models, thus enhancing the institution's capacity for change and innovation (Senge, 2000).

The organizational learning capabilities of higher education institutions are, however, a mixed bag of both positive and negative qualities. On the positive side of the ledger, universities possess many knowledge resources that could support organizational learning. These organizations collect extensive amounts of data, and employ academic and professional staff who are skilled in research methods. Higher education institutions espouse learning and knowledge acquisition as primary values, and these organizations use committees and other team-based structures, which can promote knowledge sharing and collective problem solving (Borden and Kezar, 2012). Despite those favorable features, universities are characterized by a large number of barriers to organizational learning. High levels of specialization, structural differentiation, and extensive decentralization can disrupt learning and block the flow of knowledge from one unit to another (Dee and Leišytė, 2016).

One of the largest challenges to organizational learning in higher education institutions relates to barriers in the flow of organizational knowledge. Specifically, the knowledge developed by individuals and groups may not connect to learning for the organization as a whole. When knowledge flows are blocked, the knowledge gained in one unit cannot inform or improve practices in other parts of the organization. Kezar (2005) notes that higher education institutions tend to have few mechanisms to foster communication and integration across units; therefore, pockets of knowledge often do not come together. Empirical evidence suggests that universities may, in fact, struggle to foster internal knowledge flows. In a study of 12 innovative universities, Dill (1999) found extensive evidence of external benchmarking and a high level of experimentation with new practices, but almost no evidence of processes and structures designed for internal knowledge transfer.

If organizational knowledge flows are compromised, then learning will not move from individuals and groups to the organization as a whole (Crossan *et al*., 1999). Under those conditions, organizational change will be difficult to carry out, because organizational members will lack a common language and struggle to accumulate a shared knowledge base (Carlile, 2004). Blockages and disruptions in the internal flow of knowledge may be one reason why organizational change initiatives in higher education institutions often fail to produce their intended results (Kezar and Eckel, 2002). While individual academic departments may achieve excellence, the organization as a whole will be limited in its capacity to deal with overarching challenges.

The purpose of this study is to understand the boundary conditions that foster or impede the flow of knowledge within a large public university in the United States. The university selected for this study had engaged in a strategic planning process that sought to remedy issues related to organizational performance. Student drop-out rates were high, and financial revenues were uncertain due to government reductions in funding. A strategic planning group analyzed the condition of the

university and recommended the adoption of innovative practices to improve performance. This study will focus on two of those practices: the development of a first-year experience (FYE) seminar course for undergraduate students, and the creation of an undergraduate advising center. While both initiatives sought to address the student drop-out problem, the outcomes were different. The FYE seminar received a national award as an innovative student support program, while the advising center has not achieved the level of service quality that university managers had expected.

This study addresses two research questions:

- How does knowledge flow across the boundaries of a university under conditions of organizational change?

- What boundary issues emerge in knowledge flows between managers and academics?

Literature review

Knowledge flows in higher education

Research has identified a range of barriers to the flow of knowledge in higher education institutions. As noted previously, Dill (1999) studied organizational learning practices at 12 universities that were involved in an international project on the impact of quality assurance on institutional decision making. These institutions demonstrated minimal evidence of internal knowledge transfer. Study findings also indicated that academic specialization and decentralization often limited the participation of academics in demonstration projects that sought to test innovative teaching practices. Academics tend to focus their efforts on research and teaching in their disciplines, rather than to innovations designed to improve university performance as a whole. Therefore, efforts to improve organizational performance often fail to attract sufficient involvement from academics.

The ability to move knowledge across organizational boundaries may also be related to the different modes of knowledge sharing used by managers and academics. Treleaven *et al*. (2012) studied knowledge sharing practices in an Australian university. They argued that higher education institutions tend to rely on passive forms of knowledge transfer, such as websites and databases, rather than active forms of knowledge creation. Study findings showed that active forms of knowledge creation, through cross-functional teams and communities of practice, can disseminate teaching improvement practices across the departmental boundaries of a university. Similarly, Jones *et al*. (2015), in a study of 18 public higher education institutions in the U.S., found that deliberative structures, including both general administrative structures and temporary structures such as strategic planning committees and accreditation review committees, fostered organization learning and knowledge sharing.

Knowledge sharing might be inhibited in universities that are characterized by conflict between managers and academics. The organizational learning literature suggests that the institutionalization of knowledge beyond the group level is more difficult in organizations where groups have conflicting interests (Berends and Lammers, 2010). In higher education institutions, managers and academics constitute different stakeholder groups, which have different interests related to organizational learning (Örtenblad and Koris, 2014). University managers are likely to view organizational learning as a method to improve institutional effectiveness and efficiency, while academics might associate organizational learning with opportunities to pursue new ideas and experiment with innovative practices. The different views of managers and academics regarding organizational learning are not incommensurable, but they are likely to complicate attempts at knowledge sharing between these two groups.

Organizational knowledge flows

Research suggests that the movement of knowledge across organizational boundaries can be shaped by at least three factors: 1) the type of knowledge that organizational members seek to move, 2) the cognitive and social processes associated with knowledge flows, and 3) the conditions of the boundary between the sending and receiving units. First, regarding the type of knowledge, some studies have identified "sticky" forms of knowledge that resist movement across organizational boundaries. Researchers have suggested that tacit knowledge is more difficult to move from one part of an organization to another (Lam, 2000; Nonaka and Takeuchi, 1995). This line of inquiry suggests that organizations can improve the flow of knowledge by converting tacit knowledge into explicit knowledge. A second line of inquiry focuses on the cognitive and social processes associated with knowledge flows. Crossan *et al*. (1999), for example, argue that organizational knowledge flows are activated through four processes: intuiting (individual), interpreting (individual to group), integrating (group to organization), and institutionalizing (organization). While these lines of inquiry begin to address the complexities of knowledge flows across organizational boundaries, they do not examine the conditions of the boundaries themselves. Depending on the condition of the boundary between organizational units, knowledge flows between them may be fluid or fragmented (Carlile, 2004).

To analyze the flow of knowledge in a university, this study uses Carlile's (2004) model of organizational knowledge flows. Carlile's model depicts three progressively complex boundary conditions: syntactic, semantic, and pragmatic. First, a syntactic boundary reflects differences between units in the use of codes, routines, and protocols. Different academic departments, for example, may use various terms to refer to experiential learning courses, such as internships, practicum experiences, or community-based learning. If university managers would attempt to quantify the number of experiential learning courses available to students, they probably would not arrive at an accurate count, given the divergent terms used to describe similar learning activities. To bridge this type of boundary, organizational members can develop a common lexicon that permits knowledge transfer. Specifically, organizational units can develop standard operating procedures or agree upon standard categories for the reporting of data. Such practices would enable the units to codify, store, retrieve, and transfer knowledge.

The second type of boundary condition in Carlile's model is semantic. This boundary condition emerges when different interpretations exist within the same organization. Different interpretations are likely to arise due to differences in the norms, beliefs, and values held by various professional specializations within the same organization. Different academic departments, for example, may use different measures and evidence for evaluating teaching performance. If university managers would attempt to create an institution-wide award for teaching excellence, they would likely find that academics hold a range of beliefs regarding what constitutes good teaching. Developing criteria for this award, therefore, would be challenging. To address differences in interpretation, organizational units can engage in knowledge translation, which can be achieved through the use of collective stories or the development of common artifacts. These practices can foster coordinated action, because they establish common meanings across organizational boundaries. A committee of academics from different departments, for example, could identify teaching practices and outcomes that they all value, regardless of disciplinary affiliation, and those practices and outcomes could guide the development of criteria for a teaching excellence award.

The third type of boundary condition is pragmatic. A pragmatic boundary is characterized by conflicting interests and contested knowledge claims. Under these highly-charged conditions, efforts to develop a common language or establish a set of common meanings would likely be

viewed as an attempt to silence those who hold opposing views. Powerful groups would be seen as having more influence in the development of common meanings across units, and thus, the knowledge transfer process could be viewed as one group imposing its will upon other groups. For example, managers and academics who hold formal power through their membership on a strategic planning committee could seek to enhance the research profile of their institution, but other academics at that institution could raise concerns regarding whether enough resources would remain available to support teaching. These types of conflicting interests could not be resolved simply through establishing common language or common meanings. Instead, knowledge transformation processes would be needed to build coordination among units.

Knowledge transformation involves the joint production of knowledge and the identification of common interests that transcend the local interests of each unit. This can occur through the development of models and prototypes, or through participation in pilot projects that involve members from different units. These practices often require significant investments in time and relationship building (Kellogg *et al*., 2006), as well as a willingness to transcend differences in power and authority. For example, the members of the strategic planning committee could reframe their views regarding research to include projects that integrate research with undergraduate education, and the academics who are committed to teaching could identify ways in which a growing research capacity could enhance the type of instruction that they provide to students. Each group could set aside its initial position and collectively generate new understandings that allow the previously oppositional groups to work together.

The Carlile model also specifies that the level of novelty in a situation affects the type of boundary conditions that emerge. Novelty refers to the amount of newness or unfamiliarity that individuals perceive in a situation. Under low levels of novelty, coordination issues between units would likely be limited to syntactic boundary issues. If organizational members are dealing with familiar tasks, then they will be able to rely upon routine processes and use common language to facilitate knowledge transfer. When the level of novelty increases, semantic boundary issues are likely to emerge, as different organizational units assign different meanings and interpretations to the changing conditions. Furthermore, high levels of novelty can destabilize existing structural arrangements and generate conflict regarding how the organization should respond to changing conditions. These conflicts are likely to reveal pragmatic boundaries between units that have different interests in the status quo. Thus, as the level of novelty in the situation increases, boundary issues become more complex and difficult to address. Table 1 highlights the important features of Carlile's model.

INSERT TABLE 1

Methods

The research site was a public university with approximately 25,000 students and 1,100 full-time academics. The criteria for selecting this institution included: 1) the institution had recently (within the past three years) developed a strategic plan that included goals to enhance revenues and quality, 2) the institution had recently assessed the effectiveness of its curriculum and reformed its educational offerings, and 3) the institution had enacted changes to its personnel policies to clarify expectations for research and teaching performance. The rationale for these criteria is that strategic planning processes are likely to stimulate the knowledge flows associated with organizational learning, and/or reveal blockages and impediments to such flows (Vaara and Whittington, 2012).

Interviews were conducted with 51 academics and 40 managers, who were selected because they were involved in at least one organizational initiative related to the university's strategic plan. The

interview protocol included semi-structured questions, which allowed the study participants to describe the effects of institutional strategies and policies on their work. The study used thematic data analysis (Boyatzis, 1998), which included deductive and inductive coding.

Findings

Strategic planning and organizational change

The university initiated a strategic planning process that sought to improve organizational performance, particularly in the areas of undergraduate student retention and degree completion. The planning process was carried out by a strategic planning committee, which was appointed by the university president. The committee totaled more than 20 members, including the chief academic officer, several deans of colleges, academic department chairs, and the head of the academic senate.

The committee developed a set of goals that were intended to guide organizational performance and shape decisions regarding resource allocation. To achieve these goals, the committee recommended the adoption of several new practices that they had identified as having potential to improve institutional performance. These new practices were identified through an environmental scan that was conducted by committee members. Environmental scanning activities included a review of websites of similar universities, participation by some committee members in a national conference on university reform, and informal inquiries made to colleagues at other universities.

One of the strategic goals focused on the improvement of undergraduate student retention. The strategic planning group recommended two practices to advance that goal: the development of a first-year experience (FYE) seminar, and the creation of an undergraduate student advising center. FYE seminars seek to address the drop-out problem by providing higher levels of academic and social support to students during their first year of college – the year in which drop-out rates are highest (Braxton, 2000). Likewise, undergraduate advising centers seek to address the drop-out problem by providing coordinated services to students, and by compiling data on student performance, so that students who need academic assistance can be identified before they become at-risk for dropping out (Tinto, 2010).

After the university president approved the strategic planning document, implementation teams were created for each new practice that university managers planned to implement. When the implementation plans for the FYE seminar and the advising center were shared with academics, many expressed opposition. Based on this opposition, university managers delayed the implementation of FYE for one year, as a new committee was formed to develop a different format for the course. Implementation of the advising center was also delayed for one year, but the initial implementation plan remained unchanged.

When the FYE seminar was fully implemented, study participants credited the program with contributing to significant improvements in undergraduate student retention rates at the university. A top-level manager, for example, noted that “we require entering freshmen to take the [FYE] seminar. The impetus for creating FYE was to improve retention, and we have seen a 12% increase in first-year to second-year retention since implementing the program.” After two years of implementation, the university’s FYE seminar received an award from a national association that recognizes innovative academic programs. The FYE seminar was also a catalyst to create new professional development programs, including a summer institute for academics who teach FYE courses.

When the plan for the advising center was implemented, department chairs and academics remained skeptical regarding its performance. A department chair, for example, argued that "there is a risk that students may be advised incorrectly at the center, which could set them back in their progress toward the degree." Another academic expressed similar concerns: "I hold a dim view of the advising that students receive from the central advising office. Students often come to me, missing critical information."

The academics interviewed for this study acknowledged the importance of providing students with a consistent and positive advising experience, but they questioned how the administration was attempting to achieve that goal. And they disagreed that the advising center was reducing their workloads. Specifically, they described instances of rework, in which they met with students who had received incorrect information from the advising center. Academics were then compelled to spend additional time with students to provide appropriate and accurate information.

Novelty

For academics, the FYE seminar was a novel idea; many reported that they did not know what an FYE seminar was until the university's strategic planning group introduced the idea. In contrast, academics did not interpret the advising center as a novel idea. Academics viewed the advising center as consistent with a centralized model of advising – a model that they believed they understood and which they largely opposed.

Based on Carlile's (2004) framework, boundary issues would be more complicated for the FYE seminar than for the advising center, given the higher levels of novelty associated with FYE. In fact, boundary issues were complicated for FYE. When the strategic planning committee conveyed its recommendation to establish FYE seminars, academics raised a large number of questions. In particular, academics were concerned that the FYE seminars would lack significant content from the disciplines. In response, university managers convened two organization-wide meetings to convey information about the plan for FYE seminars, but academics continued to view the proposed program as lacking academic rigor.

The novelty of the FYE seminars revealed a pragmatic boundary between academics and managers. The boundary was demarcated by values-based assertions from academics regarding what constitutes legitimate coursework, and from managers regarding concerns for organizational effectiveness. University managers convened two organization-wide meetings that sought to establish a common interpretation of FYE, but instead, the meetings generated more conflict regarding the purpose of the program. According to Carlile (2004), knowledge transformation processes would be needed to bridge this pragmatic boundary between managers and academics.

After two organization-wide meetings failed to establish common meanings regarding FYE, managers discarded the original FYE proposal that was developed by the strategic planning committee. A new university-wide committee, comprised of managers and academics, was then established to design a new FYE model. Through the work of this committee, knowledge regarding FYE was transformed for both groups. The previous conflict regarding course content was alleviated through the development of an FYE model that accommodated the interests of both managers (to reduce student drop-out rates) and academics (to teach courses consistent with the principles of their discipline).

In the new model, academics were given greater authority to determine the content of the FYE courses, while at the same time, the courses continued to emphasize academic skill development so that first-year students could receive assistance before they become at-risk for dropping out. A top-

level manager contrasted the amount of support for the FYE program to the previous effort to establish first-year seminars.

> The previous attempt to implement a first-year seminar generated some faculty resistance to what they perceived as non-academic content [e.g., helping students adjust to college life]… Now the seminar is very academic. A faculty committee designed it. The theme is the value of liberal education and it can be taught through the lens of any discipline.

To summarize, the proposal to establish FYE seminars held a high level of novelty for academics. This level of novelty contributed to the emergence of a pragmatic boundary between managers and academics. Managers addressed this boundary through knowledge transformation processes that led to the implementation of a revised FYE program, which academics strongly supported.

Professional identity

While the concept of novelty explained the boundary issues regarding the FYE seminar, the boundary issues that emerged for the advising center were associated instead with the concept of professional identity. The advising center model removed advising from the role of academics, and gave those responsibilities to advising staff. Academics, however, viewed advising as a form of teaching, and the removal of advising from their set of responsibilities challenged their professional identity. "People in the advising center don't know our major. They don't know our requirements or what our students need," argued an academic. "So how are they qualified to advise them?" University managers, however, interpreted the advising center differently. They believed that the center would provide consistent and coordinated advising, and would relieve academics from the heavy workload associated with advising students. "This was supposed to be a win-win," noted a top-level manager. "Faculty were getting some help with their workloads, and students would have a full-service advising center to address their needs."

Based on Carlile's (2004) framework, managers and academics encountered yet another pragmatic boundary – in this case, due to the professional identities of academics, rather than the novelty of the situation. However, instead of creating opportunities to transform knowledge about advising, university managers simply tried to transfer more knowledge. Academics indicated that after they had raised objections to the advising center proposal, managers sent them additional data reports about the university's drop-out problem, but they did not engage in any efforts to translate or transform knowledge about advising. Managers held to their views on the efficiency of centralized advising services, while academics maintained that advising should solely be within their domain of activity.

Power dynamics

Carlile (2004) noted that mismatches may occur between the knowledge processes used by organizational members and the boundary conditions present in the organization. In the case of the FYE proposal, a pragmatic boundary was addressed through processes that transformed the knowledge bases of both managers and academics. In the case of the advising center, the boundary issue was again pragmatic, but only knowledge transfer processes were used. No effort was made to transform knowledge about advising.

Power dynamics may explain why knowledge transfer processes are used, when knowledge transformation processes would be more appropriate. The knowledge transformation process suggests that powerful actors are willing to set aside their interests, so that new common interests can be established across organizational boundaries. Powerful actors, however, may be unwilling to

deviate from their initial stances (Coopey and Burgoyne, 2000). In this study, managers adhered to their initial stance regarding advising, and academics interpreted that stance as a display of top-down power. As an academic noted, "This is just another example of the administration's unilateral decision making." In contrast, power was addressed differently for the FYE proposal. Managers discarded their initial proposal, and used information-rich media (meetings, face-to-face discussions) to transform knowledge about FYE.

The different approaches to power may be attributable to levels of perceived interdependence across the relevant organizational boundary. Managers viewed FYE as requiring high levels of participation by academics. "We need them to agree to teach the FYE courses," explained a top-level manager. "This was not going to work without them." In contrast, managers believed that the new advising center would decouple advising from the work of academics, and implementation would not require participation by academics. Furthermore, knowledge transformation processes consume more time and effort than knowledge transfer processes, and university managers indicated that they did not want to entertain any further delays in the implementation of practices associated with the strategic plan. Thus, time pressures may have led managers to choose knowledge transfer over knowledge transformation.

Conclusions

Discussion of findings

Study findings suggest that knowledge transformation processes do not necessarily mean that one party must surrender its beliefs and adopt the perspectives of more powerful groups. In the FYE case, academics held to their view that FYE seminars should adhere to the norms of their disciplines, while managers retained their perspective on FYE as a mechanism for improving undergraduate student retention. Neither group surrendered its interests. Instead, both groups established a shared commitment to FYE, but for different reasons. Academics became committed to FYE because they believed that the program would provide them with an opportunity to engage in innovative teaching practices within their disciplines. Managers were committed to FYE because they saw the value of the program for improving retention of students and maintaining their tuition revenues. This finding is similar to Galison's (1999) research on how distinct communities within physics – theorists, experimentalists, and engineers – coordinated their actions without homogenizing the diversity of their interpretations and identities. Galison referred to these interactions as occurring within a "trading zone," where different parties engage in a transaction for different purposes but achieve a common result.

Academics became committed to the FYE proposal through a process that Tsoukas (2009) describes as conceptual expansion. Through discussions in the university-wide committee, the meaning of FYE was expanded to include dimensions that appealed to academics, including innovative teaching practices and opportunities for professional development. Both managers and academics indicated that committee-based discussions of FYE began to emphasize the concepts of innovation and professional development, which represented an expansion of the FYE concept beyond its initial meaning associated with student retention. This conceptual expansion enabled academics to establish a sense of commitment to the FYE proposal.

Practical implications

Study findings demonstrate that higher education institutions can foster knowledge creation and knowledge sharing during the organizational change process. When seeking to implement new initiatives to enhance institutional performance, university managers and academics can view

organizational change as a learning process that involves creating and moving knowledge across organizational boundaries. Under conditions of change, the creation and movement of knowledge may require the development of new structures and the use of communications that have a high level of media richness.

First, the study findings suggest that organizational structures can play an important role in facilitating knowledge flows. In the FYE case, managers discarded their initial proposal, and created a new structure; specifically, a university-wide committee that served as a venue for interaction between managers and academics. This structure provided not only a venue for communication of meaning but also conveyed the sense that managers and academics were willing to invest time in relationship building. In contrast, no new structures were created to negotiate differences between managers and academics in the case of the advising center proposal. In the absence of structural venues, interactions between conflicting parties become limited and formalized, and opportunities for knowledge translation or knowledge transformation become non-existent.

Second, this study's findings are consistent with Daft and Lengel's (1986) concept of media richness, which they defined as "the ability of information to change understanding within a time interval" (p. 555). Rich media have a strong capacity to change understandings within a relatively brief timeframe. This capacity is highest in media that allow for immediate feedback and that convey multiple cues such as body language and tone of voice. Face-to-face communication is a rich medium, but email correspondence is low in media richness. In the FYE case, managers used rich media – face-to-face interactions in committee meetings – while in the advising center case, managers distributed spreadsheets via email (low in media richness). When different groups engage together in the use of rich media, they are more likely to build shared understandings that support collaborative approaches to change and institutional improvement.

References

Berends, H. and Lammers, I. (2010), "Explaining discontinuity in organizational learning: A process analysis", *Organization Studies*, Vol. 31 No. 8, pp. 1045-1068.

Borden, V. and Kezar, A. (2012), "Institutional research and collaborative organizational learning", in R. Howard, G. McLaughlin and W. Knight (Eds.), *The handbook of institutional research*, Jossey-Bass, San Francisco, pp. 86-106.

Boyatzis, R. (1998), *Transforming qualitative information: Thematic analysis and code development*, Sage, Thousand Oaks, CA.

Braxton, J. (Ed.) (2000), *Reworking the student departure puzzle*, Vanderbilt University Press, Nashville, TN.

Carlile, P. (2004), "Transferring, translating, and transforming: An integrative framework for managing knowledge across boundaries", *Organization Science*, Vol. 15 No. 5, pp. 555-568.

Coopey, J. and Burgoyne, J. (2000), "Politics and organizational learning", *Journal of Management Studies*, Vol. 37 No. 6, pp. 869-885.

Crossan, M., Lane, H. and White, R. (1999), "An organizational learning framework: From intuition to institution", *Academy of Management Review*, Vol. 24 No. 3, pp. 522-537.

Daft, R. and Lengel, R. (1986), "Organizational information requirements, media richness, and structural design", *Management Science*, Vol. 32 No. 5, pp. 554-571.

Dee, J. and Leišytė, L. (2016), "Organizational learning in higher education institutions: Theories, frameworks, and a potential research agenda", in M. Paulsen (Ed.), *Higher education: Handbook of theory and research,* vol. 31, Springer, Dordrecht, Netherlands, pp. 275-348.

Dill, D. (1999), "Academic accountability and university adaptation: The architecture of an academic learning organization", *Higher Education*, Vol. 38 No. 2, pp. 127-154.

Galison, P. (1999), "Trading zone: Coordinating action and belief", in M. Biagioli (Ed.), *The science studies reader*, Routledge, New York, pp. 137-160.

Jones, S., Dougherty, K., Lahr, J., Natow, R., Pheatt, L. and Reddy, V. (2015), *Organizational learning by colleges responding to performance funding: Deliberative structures and their challenges* (working paper no. 79), Community College Research Center, New York.

Kellogg, K., Orlikowski, W. and Yates, J. (2006), "Life in the trading zone: Structuring coordination across boundaries in post-bureaucratic organizations", *Organization Science*, Vol. 17 No. 1, pp. 22-44.

Kezar, A. (2005), "What campuses need to know about organizational learning and the learning organization", in A. Kezar (Ed.), *Organizational learning in higher education: New directions for higher education*, No. 131, Jossey-Bass, San Francisco, pp. 7-22.

Kezar, A. and Eckel, P. (2002), "The effects of institutional culture on change strategies in higher education: Universal principles or culturally responsive concepts", *Journal of Higher Education,* Vol. 73 No. 4, pp. 443-460.

Lam, A. (2000), "Tacit knowledge, organizational learning, and societal institutions", *Organization Studies*, Vol. 21 No. 3, pp. 487-513.

Nonaka, I. and Takeuchi, H. (1995), *The knowledge-creating company: How Japanese companies create the dynamics of innovation*, Oxford University Press, Oxford, UK.

Örtenblad, A. and Koris, R. (2014), "Is the learning organization idea relevant to higher educational institutions? A literature review and a multi-stakeholder contingency approach", *International Journal of Educational Management,* Vol. 28 No. 2, pp. 173-214.

Senge, P. (2000), "The academy as learning community: Contradiction in terms or realizable future?", in A. Lucas (Ed.), *Leading academic change: Essential roles for department chairs*, Jossey-Bass, San Francisco, pp. 275-300.

Tinto, V. (2010), "From theory to action: Exploring the institutional conditions for student retention", in J. Smart (Ed.), *Higher education: Handbook of theory and research*, Vol. 25, Springer, Dordrecht, Netherlands, pp. 51-89.

Treleaven, L., Sykes, C. and Ormiston, J. (2012), "A dissemination methodology for learning and teaching developments through engaging and embedding", *Studies in Higher Education*, Vol. 37 No. 6, pp. 747-767.

Tsoukas, H. (2009), “A dialogical approach to the creation of new knowledge in organizations”, *Organization Science*, Vol. 20 No. 6, pp. 941-957.

Vaara, E. and Whittington, R. (2012), “Strategy-as-practice: Taking social practices seriously”, *Academy of Management Annals*, Vol. 6 No. 1, pp. 285-336.

Table 1
Relationship between boundary conditions and organizational knowledge flows

Boundary condition	**Related knowledge flow challenges**	**Likely to emerge when…**	**Can be addressed through…**
Syntactic	Differences in codes, routines, protocols	Novelty in the situation is low; familiar, routine tasks	Knowledge transfer by establishing common lexicon and standard operating procedures
Semantic	Differences in interpretations	Novelty in the situation is moderate	Knowledge translation by establishing common meanings among groups
Pragmatic	Differences in interests and priorities	Novelty in the situation is high; non-routine tasks	Knowledge transformation through joint production of new knowledge that transcends group interests