

# *Case Study: Teacher Knowledge Networks in Ontario, Canada*

Dr. Sonia Ben Jaafar

Education Consultant

[s.benjaafar@edueval.com](mailto:s.benjaafar@edueval.com)

## **Contents**

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Knowledge Management: Considering Contemporary Literature .....	1
KM as a Social Process .....	1
The Influence of Information & Communications Technology .....	2
Ontario's province-wide Knowledge Management Initiative .....	3
NEOEN PNC.....	6
MiSA work in the NEOEN PNC.....	6
NEOEN's Knowledge Sharing Practice: A Work in Progress .....	9
Moving Forward from ICT to Systematic Data-Based Decision Making.....	10
References .....	10

In today's knowledge economy, organizational learning has become instrumental in the survival of public sector organizations. According to Yukl (2009), organizational learning is about the collective of individuals who systematize new solutions, effectively redefining the parameters of organization to expand beyond a single entity. Creating the conditions for this complex organic process to be fruitful can be difficult in large public sector organizations. The case study in this paper describes the organizational learning work of a group of school boards in Ontario, Canada who are working on operationalizing a province-wide Ministry initiative. This case study particularly focuses on the technology involved in facilitating the social processes as a mechanism for knowledge management.

This case study will report on the collaborative work of the North Eastern Ontario *Education Network* (NEOEN) in response to the provincial *Managing Information for Student Achievement* (MiSA) *Professional Network Centre* (PNC) initiative. The paper is presented in three parts: First, the introduction to the literature on social processes and ICT within the domain of knowledge management; second, the description of the MISA PNC and their work; finally, a discussion of the work in terms of the literature given this illustrative case.

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## Knowledge Management: Considering Contemporary Literature

The conceptual lens for this case study was extracted from a comprehensive literature review on knowledge sharing and creation from 2002-present. The comprehensive contemporary literature review was conducted as part of the *Beyond tinkering: The school district's role in large-scale reconstruction of professional practice* project funded by a Social Sciences and Humanities Research Council Strategic Research Grant.

The literature is fraught with theoretical articles and deficient in empirical articles. This is perhaps a product of the youth of the knowledge management field. There are issues that are still evolving and issues for which a collective understanding is slowly being established. Notwithstanding the variation in the literature, there are some relatively consistent insights about the current state of the field that can be drawn from the review:

- Practical innovations grow from a process when knowledge workers purposefully interact in a group to share and create knowledge.
- Although networks are promoted, there are a lot of failed attempts (Hatala & Lutta, 2009) (Scarbrough, 2003; Yu, Kim, & Kim, 2007; Zarraga & Garcia-Falcon, 2003)
- Organizational conditions and internal processes are critical elements for knowledge workers to engage in the appropriate kinds of social interactions for knowledge sharing and creation
- Leadership is an essential component for creating the right

environment for knowledge sharing and creation

These insights indicate that leadership plays a vital role in the successful introduction, growth, and sustainability of knowledge management practices within any organization. In creating the conditions for KM, leadership needs to be acutely aware of two key dimensions that interact. First, that KM is a social process, and second, that contemporary social processes are affected by ICT. The theoretical importance of these two dimensions is briefly discussed below as a foundation for appreciating their significance in the NEOEN case study.

### KM as a Social Process

Knowledge is more than simply the manipulation of information, it is an organic asset that moves within social processes (Pitt & MacVaugh, 2008). Social processes describe the interactions between individuals that serve as the channel for knowledge management in practice. When knowledge is regarded as dynamic and emergent rather than a static commodity, it is no longer independent from the individual mind and hence needs to be constructed by participants in a socio-cultural context (Hannay & Mahony, 2005; Paavola, Lipponen, & Hakkarainen, 2004). Understanding these social processes is a key to creating the conditions for individuals to move from independent learning and work to knowledge sharing and creation.

Tacit and potential knowledge are embedded in social practices. These forms of knowledge are highly contextualized and need to be shared and created through social practices. They cannot be acquired simply through direct means (Murray & Moses, 2005; Paavola, et al., 2004; Patrick & Dotsika, 2007; Yazici, 2005). Matsuo &

Easterby-Smith (2008) found that there are two types of knowledge-sharing models: *creative* and *non-creative* knowledge sharing. The former engages the participants and stimulates experiential learning and innovation. The latter hinders experimentation and customization. This means that knowledge sharing, in some cases, can hinder knowledge creation. The complexity of these processes makes measuring knowledge paths and transactions difficult in organizations as classic metrics for business performance functions have proven to be insufficient (Dalmaris, Tsui, Hall, & Smith, 2007).

This perspective on knowledge creation promotes value creation. It presumes that individuals have the ability to recognize valuable knowledge and transform or reconstruct it into something of greater future value (Bergman, Jantunen, & Saks, 2004). For this level of insightful learning to occur, individuals generally require external support where “external” is outside the individual (Berson, Nemanich, Waldman, Galvin, & Keller, 2006). The role of external support is tightly coupled with the nature of how the human brain operates. The human brain works based on mental schema which is constantly being adapted through simultaneous processes of assimilations and accommodation. When disequilibrium of these processes occurs, there is an opportunity for cognitive development. In order for learning to occur, individuals need to challenge their current perceptions and understanding of the world. This necessarily describes a space where the individual accepts a degree of ambiguity where what they believe to be true is put into question. Given that an individual mental schema frames how an individual thinks, it is not feasible to accomplish a sense of disequilibrium when there is not another perception to challenge one’s own in a

debate. This necessarily involves others, which in turn, means that social processes become the venue through which individuals learn and people develop common understandings and collective intelligence (Boder, 2006).

The literature regarding the operations of social processes for knowledge management has a number of theoretical articles that discuss the importance and benefits of creating opportunities for groups of individuals to engage in some kind of social practice in order to achieve a collective learning experience. Unfortunately, there is a shortage of corresponding empirical articles that describe the nature of these social processes. The complexity of cultivating appropriate social processes within an organization is critical to successful knowledge management as made evident by the countless examples of failed initiatives where groups of professionals work together unsuccessfully (See Scarbrough, 2003; Yu, et al., 2007; Zarraga & Garcia-Falcon, 2003). Knowledge management implementation is still being developed because it is a young field that embodies several simultaneous processes, and success depends on understanding social processes and on the nature of the organization (Dufour & Steane, 2007). Gaining insight into the nature of the social processes is critical to achieving the promise purported by the theoretical literature.

### The Influence of Information & Communications Technology

Information & Communications Technology (ICT) needs to be highlighted for three reasons. First, it is an evolving field that is changing the landscape of how knowledge is accessed, stored, disseminated, and shared. Second, because there is a growing literature that addresses knowledge management practices using ICT rather than

face to face interactions. Finally, organizations in the hi-tech sector organizations have been found to be the most effective in integrating knowledge management practices. The reason for their evolved state is the strong connection between human and technological initiatives (Moffett & McAdam, 2009).

Given the importance of organizational culture, trust, relationships, conversations, and ambiguity for tacit and potential knowledge assets, it is important to pause and consider the way technology is reconstructing the knowledge environment and how organizations are reacting to these changes. We have moved well beyond static sharing. For example, there are now software programs that permit individuals to develop concept maps, individually or collectively, as a tool to represent their knowledge building (Chang, Sung, & Lee, 2003).

In practical terms, new structures to support knowledge management are required for knowledge workers who have time constraints and deadlines to make the best use of the plethora of knowledge that is available electronically. Already, formal archiving, consolidating repositories, quality reviews, and connecting relevant practices to work have proven to be of critical value for knowledge workers to access and benefit from this technology (Wilson, Glanville, & Watt, 2003; Wilson, Petticrew, & Booth, 2009). Communication tools such as synchronous conferencing, audio recordings, Wikis, web publishing, teleconferencing, emails, discussion boards, and intranet support the different boundary spanning processes in networks and across organizations (Hustad, 2007). Finally, new collaborative tools such as electronic calendars, workflow systems, and social software systems are refurbishing how teams

work together while apart. The technology is a tool, and the human interaction with the technology is the critical element. Fostering appropriate human interactions requires training to facilitate the transition to a modified culture of learning with these new tools (Laycock, 2005).

In addition to the ICT infrastructure that has become integrated in the norms of current organizational practice, there is a move towards computer-supported collaborative learning (CSCL). CSCL is a mechanism that facilitates social interactions related to learning. When these tools incorporate an accessible virtual environment, they are often called web-based or online systems. These systems are intended to enable learners to collaborate and practice critical reflection, conflict negotiation, and consensus building just as in face-to-face learning environments. However, in the case of web-based interactions, participants are required to exchange ideas, share perspectives, and use their previous knowledge to decide or design a solution, otherwise, there is no joint output. (Dewiyanti, Brand-Gruwel, Jochems, & Broers, 2007).

### **Ontario's province-wide Knowledge Management Initiative**

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The Ontario education system has become internationally recognized by its PISA results. The success of the system is directly linked to the work of teachers who are constantly being engaged in professional learning. The challenge for the Ministry of Education is to continually support and engage teachers in 4,923 schools across 1,076,395 km<sup>2</sup>. In 2005, the Ministry of Education introduced the Managing Information for Student Achievement (MiSA) Professional Network Centre (PNC) initiative to help their educators meet that

challenge. This initiative grows out of collaborative and group learning theory and relies on an online learning environment because of Ontario's geography. It is also the first initiative of its kind in terms of a systematic linkage of districts in public education sector.

MISA's goal is to build capacity at both the provincial and school board levels through a focus on data-based decision making using a common data management system. Schools and school boards were offered guidelines, support, and funding to develop standards and guidelines for data management and decision making to improve system-wide instructional practice. There were two major components to this initiative, the technical component which consists of the data management system and the establishment of 7 Professional Network Centres (PNCs) across the province to promote sharing of effective practices. MISA PNCs are intended to provide useful forums for discussion about issues and opportunities related to evidence-informed decision making in education system. Each PNC works to develop and implement activities for their own boards' development for MISA work. This case study will present the activities of the NEOEN PNC which is founded on the provincial guidelines. It is therefore important to first understand the provincial initiative.

In their efforts to support a consistent development and growth, the Ministry developed and released the *Common Core Capacity Guideline For District School Boards and School Authorities on Managing Information for Student Achievement*. These guidelines are intended to support school systems in developing an effective systemic evidence-informed decision-making culture. They are presented as a set of three categories of core capacities to use data to

support student achievement: (i) Data management, (ii) human resources, and (iii) technology. For each of these categories, there exists a descriptive definition accompanied by a characterizing set of sub-categories to help create a common provincial framework. The three-part framework is characterized as follows:

1. Data Management
  - a. Data Holdings
  - b. Data Cleansing
  - c. Data Mapping
  - d. Data Integration & Analysis
  - e. Data Access
2. Human Resources
  - a. Data collection, storage and inventory creation
  - b. Data correlation, analysis and looking for patterns
  - c. Data-based reports that are simple and comprehensive
  - d. Data-based dialogue related to student achievement strategies
  - e. Engaging staff in gathering, analysing and discussing appropriate data
3. Technology
  - a. Implementing a Student Management System (SMS)
  - b. Local Analysis and Reporting Tools

In 2005, the Ministry reported on an environmental scan of the status of these categories in the boards in Ontario and determined that there were serious inconsistencies in the core capacities. To support growth within all boards without prejudice, the Ministry developed a continuum that made the growth within each sub-category explicit within 4 implementation phases:

#### I. Pre-Implementation

- II. Early Implementation
- III. Building Capacity
- IV. Sustaining Capacity

*The MiSA Common Core Capacities Continuum* is a central and common tool for PNCs to use with boards to identify their current status within a domain, develop a strategic plan with specific goals targeting each category, and to monitor growth within the categories over time.

## NEOEN PNC

The North Eastern Ontario Education Network (NEOEN) Professional Network Centre consists of 10 central school organizations:

- I. Algoma District School Board (64 schools & 12, 549 students)
- II. Huron Superior Catholic District School Board (26 schools & 6471 students)
- III. Rainbow District School Board (51 schools & 16, 920 students)
- IV. Sudbury Catholic District School Board (24 schools & 7027 students)
- V. Northeastern Catholic District School Board (5 schools & 1462 students)
- VI. District School Board Ontario North East (40 schools & 9264 students)
- VII. Northeastern Catholic District School Board (13 schools & 2847 students)
- VIII. Nipissing-Parry Sound Catholic District School Board (14 schools & 3452 students)
- IX. Near North District School Board (43 schools & 13150 students)
- X. North Eastern Ontario School Authorities (2 schools & 123 students)

NEOEN includes a total of 282 schools, with 4590 teachers educating 57 265 students. This PNC's shared vision is to leverage the strength of the North Eastern Ontario Education Network in creating a culture that places evidence-based decision-making as an integral part of instructional practice.

## MiSA work in the NEOEN PNC

Since 2005, when the MiSA PNC initiative was launched, the NEOEN PNC has evolved. The network is strongest at the level of senior administration where district leaders directly involved in the PNC decision making are located. Over the last 3 years, the work that has been accomplished has been at the initial stages of systematizing data-based decision making. The PNC has and continues to work on the following tasks:

1. Implementing an Online Transition Form
2. Supporting Privacy and Information Management
3. Deploying a toolkit to support boards
  - a. The data calendar provides principals with a list of critical data highlighting key times throughout the year. In addition to student achievement data in local and provincial assessments, it has functionality that allows for tracking and comparisons.
  - b. The PNC facilitated the partnership of 8 boards in selecting the same data management product to leverage influence with the vendor to meet their local needs for monitoring and reporting purposes.<sup>1</sup>

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<sup>1</sup> This was important since the geography and size of the boards means that the funding resources is not powerful. But as a unit, they were able to request a product that fits their needs and create the conditions for a vendor to be interested in meeting their needs

*Achievement Plus* is the name of the interface that has been developed for the boards. It targets facilitating a link between the data and reporting on important information in reports that would support targeting student achievement. The supportive facilities that were examined include:

- a) At Risk - Tracking Board/Data Wall Card
- b) Historic Class Assessment
- c) Course Trend Secondary
- d) Class Profile
- e) Summary Snapshot
- f) Credit Accumulation - Below Target
- g) Credit Accumulation Comparison
- h) Elementary Learning Skills

- i) Secondary EQAO<sup>2</sup> Class Comparison
- j) Secondary Pre-Registration Profile
- k) Leaver and Student Retention
- l) Graduation Rate

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<sup>2</sup> The Education Quality and Accountability Office (EQAO) is responsible for the provincial standardized assessments in Ontario. They develop and release the Grade 9 Mathematics assessment and a Ontario Secondary School Literacy Test at the secondary level.

Ontario District School Board :: > Achievement Plus

Welcome WM-SP1\Administrator

Achievement Plus

Home Reports

Achievement Plus > Pages > Demographics Viewer > Demographics Viewer

### Demographics Viewer

Demographics Viewer : Demographics Viewer

Demographics Viewer

North Eastern Ontario Education Network  
A Direction For Change

Category/Map:

- 2006 Age and Gender
- 2006 Education
- 2006 Mobility
- Education**
- Ethnic Origin
- Families
- Home Language
- Income
- Income-Town
- Mobility
- Population
- Recent Immigrant

Field Value:

- Pop 20+
- Less than Gr 9
- Some HS**
- HS Diploma
- Trades
- Some College
- College Diploma
- Some Univ
- Univ Degree

Municipality	Pop 20+	Less than Gr 9	Some HS	HS Diploma	Trades	Some College	College Diploma	Some Univ	Univ Degree
Aurora	26680	745	2845	3465	2305	1830	5370	2460	7640
East Gwillimbury	14165	470	2320	2375	1990	1120	3075	885	1980
Georgina	26920	1595	6535	4630	3970	2135	4800	1190	2020
King	13410	1035	1795	1810	1530	785	2180	1100	3125
Markham	151185	11515	17580	18660	10215	8660	24730	16420	43240
Newmarket	44245	1925	6325	6560	4495	3510	9380	3115	8810
Richmond Hill	94750	6515	10055	10965	7120	5045	15520	9810	29685
Vaughan	127605	18235	13705	15370	11495	7690	20435	10820	29995
Whitchurch	15605	920	2635	2210	1675	915	3130	1080	2990
Stouffville									

4. Developing targeted learning networks so that there is a forum for like schools to collaborate across the region. The like schools are being established through the use of information from Achievement Plus.
5. Funding 9 research projects to foster a culture of inquiry

find that most of the work that was accomplished falls within the categories of Data Management and Technology. The focus on human resources has been a recent effort in NEOEN. It is important to note that there was a degree of human resource development in all of the Data Management and Technology activities because the boards were moving forward. However, the school-level human resource development was not a central focus.

The PNC's activity provides an impressive list, but the level of penetration at the ground level for knowledge sharing and creation is not self-evident from the work that has been completed to date. If we cross-reference the five major activities with the provincial framework and that *MiSA Common Core Capacities Continuum*, we

Activity	Category	Phase
<b>Supporting Privacy and Information Management</b>	Data Management	Building Capacity
<b>Implementing an Online</b>	Data Management	Implementation -

<b>Transition Form</b>	nt Technology	Building Capacity
<b>Deploying a toolkit to support boards</b>	Data Manageme nt Technology	Implementatio n - Building Capacity
<b>Developing targeted learning networks so that there is a forum for like schools to collaborate across the region. The like schools are being established through the use of information from Achievement Plus.</b>	Technology Human Resources	Implementatio n - Building Capacity
<b>Funding research projects to foster culture of inquiry</b>	9 to Human Resources	Implementatio n - Building Capacity

### NEOEN's Knowledge Sharing Practice: A Work in Progress

We have already established that knowledge is more than simply the manipulation of information, but it is an organic asset that moves within social processes (Pitt & MacVaugh, 2008). Social processes describe the interactions between individuals that serve as the channel for knowledge management in practice. In terms of the provincial framework supporting the

PNC, these interactions are cultivated through the development of *Human Resources* and are seriously addressed in the *Capacity Building* phase of the continuum.

In professional practice such as teaching, tacit and potential knowledge embedded in social practices are considered to be the most valuable and least accessible to dissemination. These forms of knowledge are highly contextualized and need to be shared and created through supportive social practices. They cannot be acquired simply through direct means (Murray & Moses, 2005; Paavola, et al., 2004; Patrick & Dotsika, 2007; Yazici, 2005).

The MiSA PNC work for NEOEN was explicitly focused on data-based decision making across all schools for the promotion of student success. In gross terms, we can consider student and school data as the *explicit knowledge*, and the process of using the stored data to change educational practices as the *tacit knowledge*. If we follow these parameters in characterizing NEOEN's foci, we quickly notice that knowledge sharing and creation activities have only started to be addressed in NEOEN's work because of an initial investment in the wide distribution of the explicit knowledge.

NEOEN's time-consuming initial focus and investment on Data Management and Technology should not necessarily be considered an "obstructive" or "sluggish" practice in the development of systematic data-based decision making across such a large and disperse network. In the case of NEOEN, the leadership team wanted to create the conditions that would facilitate a common progression in human resources across the network given unifying tools. In other words, NEOEN wanted to make sure that the explicit information was readily accessible to the school-level educationalists before addressing the more delicate and

difficult management of tacit and potential knowledge.

### Moving Forward from ICT to Systematic Data-Based Decision Making

ICT is only a tool, yet its presence has an impact on knowledge behaviours in organizations. In their study identifying the knowledge management behaviours of school leaders in Turkey, Celep & Cetin (2005) found a correlation between the existence of technology in schools and teacher perceptions of successful knowledge management practices. In particular, teachers in schools with web sites, internet access, and/or computer networks reported that their school was in a better environment in terms of cultural structure, knowledge centers, explicit and tacit knowledge, and learning culture as compared to their counterparts without the in-school technology. In other words, *when technology is present, educationalists believe that their environment is more conducive to success.*

Technology is a part of the organizational structure for knowledge management. Seng et al. (2002) offer five steps in a knowledge management for organizations:

- (i) Capturing knowledge
- (ii) Storing knowledge
- (iii) Processing knowledge
- (iv) Sharing knowledge
- (v) Using knowledge

Noteworthy in this 5-step framework is that technology can operate the first three steps. But, the last two steps rely on individual access and interactions with the system. This is especially true in the 5<sup>th</sup> step where individuals necessarily engage with knowledge accessed in the previous steps.

If we revisit the work and direction of NEOEN considering Seng et al.'s (2002) five-step framework, we readily notice that NEOEN has been diligently working on the

first three steps with an understanding that this will provide the foundation for sharing and using knowledge. In theory, this is a good starting point. In practice, NEOEN may run into the common predicament where the leadership relies excessively on the technology to foster knowledge management practices. This is a serious danger to the evolution of the PNC because technology has been repeatedly proven to be insufficient in fostering knowledge management practices (See Scarbrough, 2003 & Seng et. al., 2002).

The jump from the technologically supported explicit knowledge to social processes for tacit and potential knowledge management is not self-evident in theory or in practice. NEOEN needs to heed Scarbrough's (2003) warning that when knowledge management projects are managed from a technical perspective rather than on the flow of people and knowledge, they will fail! The groundwork has been established in the NEOEN network. *If* the same degree - at least - of careful and strategic attention is not offered to the development of human resources and capacity building across the network, *then* NEOEN will be another example of a failed attempt at knowledge management in practice. However, *if* NEOEN continues diligently to move beyond technology in their KM strategy, *then* the PNC's work holds every promise to flourish as an exemplary knowledge network.

### References

Bergman, J., Jantunen, A., & Saksala, J.-M. (2004). Managing knowledge creation and sharing - scenarios and dynamic capabilities in inter-industrial knowledge networks. *Journal of Knowledge Management*, 8(6), 63-76.

- Berson, Y., Nemanich, L. A., Waldman, D. A., Galvin, B. M., & Keller, R. T. (2006). Leadership and organizational learning: A multiple levels perspective. *The Leadership Quarterly*, 17, 577-594.
- Boder, A. (2006). Collective intelligence: a keystone in knowledge management. *Journal of Knowledge Management*, 10(1), 81.
- Celep, C., & Cetin, B. (2005). Teachers' perception about the behaviours of school leaders with regard to knowledge management. *International Journal of Educational Management* 19(2), 102-117.
- Chang, K.-E., Sung, Y.-T., & Lee, C.-L. (2003). Web-based collaborative inquiry learning. *Journal of Computer Assisted Learning*, 19, 56-69.
- Dalmaris, P., Tsui, E., Hall, B., & Smith, B. (2007). A framework for the improvement of knowledge-intensive business processes. *Business Process Management Journal*, 13(2), 279-305.
- Dewiyanti, S., Brand-Gruwel, S., Jochems, W., & Broers, N. J. (2007). Students' experience with collaborative learning in asynchronous computer-supported collaborative learning environments. *Computers in Human Behavior*, 21(1), 496-514.
- Dufour, Y., & Steane, P. (2007). Implementing knowledge management: a more robust model. *Journal of Knowledge Management*, 11(6), 68-80.
- Hannay, L., & Mahony, M. (2005). The role of the school district in school improvement, Year Four Funded by the Social Science and Humanities Research Council of Canada. Kitchener.
- Hatala, J.-P., & Lutta, J. G. (2009). Managing information sharing within an organizational setting: a social network perspective. *Performance Improvement Quarterly*, 21(4), 5-33.
- Hustad, E. (2007). Managing structural diversity: the case of boundary spanning networks. *The Electronic Journal of Knowledge Management*, 5(4), 399-410.
- Laycock, M. (2005). Collaborating to compete: achieving effective knowledge sharing in organizations. *The Learning Organization*, 12(6), 523-538.
- Matsuo, M., & Easterby-Smith, M. (2008). Beyond the knowledge sharing dilemma: the role of customisation. *Journal of Knowledge Management*, 12(4), 30-43.
- Moffett, S., & McAdam, R. (2009). Knowledge management: a factor analysis of sector effects. *Journal of Knowledge Management*, 13(3), 44-59.
- Murray, P., & Moses, M. (2005). The centrality of teams in the organisational learning process. *Management Decisions*, 43(9), 1186-1202.
- Paavola, S., Lipponen, L., & Hakkarainen, K. (2004). Models of innovative knowledge communities and three metaphors of learning. *Review of Educational Research*.
- Patrick, K., & Dotsika, F. (2007). Knowledge sharing: developing from within. *The Learning Organization*, 14, 395-406.
- Pitt, M., & MacVaugh, J. (2008). Knowledge management for new product development. *Journal of Knowledge Management*, 12(4), 101-116.
- Scarborough, H. (2003). Knowledge management, HRM and the innovation process. *International Journal of Manpower*, 24(5), 501-516.
- Seng, C. V., Zannes, E., & Pace, R. W. (2002). The contributions of knowledge management to workplace learning. *Journal of Workplace Learning*, 14(4), 138.
- Wilson, P., Glanville, J., & Watt, I. (2003). *NHS Centre for Reviews and Dissemination. Access to the online evidence base: a survey of the Northern and Yorkshire region*. York: University of York.
- Wilson, P., Petticrew, M., & Booth, A. (2009). After the gold rush? A systematic and critical review of general medical

podcasts. *Journal of the Royal Society of Medicine*, 102, 69-74.

Yazici, H. J. (2005). A study of collaborative learning style and team learning performance. *Education + Training*, 47(3), 216-229.

Yu, S.-H., Kim, Y.-G., & Kim, M.-Y. (2007). Do we know what really drives KM performance? *Journal of Knowledge Management*, 11(6), 39-53.

Yukl, G. (2009). Leading organizational learning: reflections on theory and research. *The Leadership Quarterly*, 20, 49-53.

Zarraga, C., & Garcia-Falcon, J. M. (2003). Factors favoring knowledge management in work teams. *Journal of Knowledge Management*, 7, 81.