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Publisher's version / Version de l'éditeur:

The ICICKM 4th International Conference Proceedings on Intellectual Capital, Knowledge Management and Organizational Learning, 2007

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October 2007

* published at The ICICKM 4th International Conference Proceedings on Intellectual Capital, Knowledge Management and Organizational Learning. Cape Town, South Africa. October 15-16, 2007. NRC 49859.

Canada

Distance Learning among Teachers and School Principals in Francophone Institutions: An Initial Knowledge Repository Associated to Individual Competencies and Organizational Capabilities for Collaborative Work

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Keywords : Knowledge repository; Web-based Distance Learning; School principal; Collaborative work; Knowledge management

ABSTRACT

More and more teachers and school principals in French-language minority contexts in Canada enrol in Web-based Distance Learning education programs. To reach instructional objectives, they are invited to complete collaborative learning activities using information and communication technologies (ICT). A number of studies have demonstrated the advantages of collaborative learning and practice communities for professional development. However, few studies have addressed the resources, knowledge and competencies adults need to possess to progress in a distance learning context. All the more, we know little about the knowledge management practices of educational institutions, although they offer more and more distance learning opportunities. As part of their research on organizational capabilities for the implementation of e-Government, St-Amant and Renard (2005) have elaborated a framework for the development of capabilities. According to the authors, two management fields need to be mastered in order to manage the development of organizational capabilities: problem resolution management and knowledge management. These two fields are strongly interrelated.

Inspired by this work, our study aims to create and evaluate an initial knowledge repository associated with individual competencies as well as organizational capabilities for collaborative work supported by ICT in a distance learning context. This article reports on preliminary results obtained from experimentation conducted with Francophone teachers and school principals enrolled in an online distance learning program, as well as the knowledge and know-how included in an initial knowledge repository. According to the results of this study, the majority of participants found the repository useful since it has improved the quality of their work and made it easier to reach instructional objectives.

1.0 Introduction

Despite the emphasis on developing learning technologies, the fact remains that adult learners in particular face difficulties in the area of Web-based Distance Learning (WBDL).

In Canada, Francophone teachers and Francophone school principals in remote parts of the country are being encouraged to enrol in distance learning courses. Many institutions of higher learning offer distance learning courses and continue to increase their course offerings. Unfortunately, even with more and more universities establishing Web-based courses, the fact remains that

> «[...] real successes are still rare. The course offerings on line are on the increase but their format and marketing are ineffective in most cases as well as their consolidation within the regular program of the establishment, and more and more people are experiencing this problem. » (Translation of Thot, consulted 6/14/07)

Several research studies have argued that collaborative learning within the context of Web-based Distance Learning leads to an increased feeling of belonging to a group, thereby breaking down barriers created by working in isolation. (CEFRIO, 2005) However, even if numerous studies show the advantages of professional development based on collaborative learning and practice communities, the fact remains that few studies look at the skills, the knowledge and the learning resources which are needed to successfully take up the challenges of Web-based collaborative learning. Therefore, the primary area of new research appears to be an in-depth study of organizational strategies needed to increase the satisfaction level of adults in relation to their learning experience as well as an increased retention rate in distance learning programs.

In the study of Web-based Distance Learning, it appears necessary to ask the following questions: how do adult learners organize their learning experience and how do they function in the process of a Web-based collaborative learning activity? What information do we have concerning the learning skills that adult learners need in order to achieve a significant learning level before, during and after a learning activity such as problem-solving and Web-based collaborative learning? Do adult learners possess the skills necessary for this type of learning within the framework of their Web-based Distance Learning? What types of learning skills are needed to participate successfully and efficiently in collaborative learning? Do Web-based instructors know how to organize collaborative learning for adult learners? Do teaching establishments provide the necessary support for adult learners to facilitate the successful completion of their course? This research project aims to provide a systemic study with the intention of better understanding this issue with the expectation of better responding to the needs of Francophone teachers and school principals.

2.0 The context of our research

2.1 The response to the request by Francophone teachers and school principals

The main challenge of education is to provide learners with all the skills needed to acquire, appropriate assimilate, use and convey knowledge. In a country like Canada where Francophone communities are often located at great distances from large population centres and universities, the quality of Web-based Distance Learning becomes an important issue. Moreover, within the context of the professional development of Francophone teachers and school principals, there is an urgent need to provide better strategies not only to solve day-to-day problems but also to take more leadership initiatives aimed at comprehensive personal

development of their students and of the entire Francophone school community, a requirement for a more committed cultural identity within Canada. As a result, the Web-based Distance Learning that the teachers and school principals participate in should allow them to attain a maximum of knowledge in order to establish and maintain their professional network.

2.2 Different platforms and technological tools for collaborative work

Educational institutions must offer distance education to meet the needs of a knowledge-based society. The use of information and communication technologies (ICT) for teaching is revolutionizing the world of education and continuing education. In 2003, the Web site *Thot* made an inventory of more than 280 hypermedia platforms to respond to the need for online learning [1]. *WebCT* and *Blackboard* are the most known and used platforms for online course delivery (Lamontagne, 2003); however, new cost effective options exist (Godwin-Jones, 2003). A variety of open source tools and software are available that encourage collaborative work, such as forums and chats, blogs and wikis (Paquet, 2002, Downes 2004, Godwin-Jones, 2003).

Wenger, McDermott and Snyder (2002) underscore that the members of a community of practice benefit from the sharing of knowledge and expertise, find assistance in the challenges they face in their practice and are more able to help members of their team in return. These researchers show several advantages in putting into place a community of practice for professionals, including a reduction in time and accumulated costs thanks to the support of the community, with less isolation, a sense of belonging, and sustained morale. Web-based Distance Learning should encourage pedagogical activities in collaborative work. Hence, what do we know about collaborative work and communities of practice? How do learners attain pedagogical objectives in collaborative work? What competences must adult learners have in order to benefit from collaborative work, from, in a community of practice? The next section defines our theoretical framework.

3.0 Theoretical framework

3.1 Organizational capabilities

St-Amant and Renard (2005) and Zollo and Winter (2002) define the concept of organizational capabilities as the ability to deploy, combine and coordinate *resources, competencies* and *knowledge* throughout different value streams, which aim to implement strategic objectives. In other words, organizational capabilities require that resources, competencies and knowledge be available, on one hand, and that they be used in domain-specific processes at some point in time, on the other. In an organization, an organizational capability therefore arise from collective activities that are learned and stable, and which deploy, combine and coordinate resources, competencies and knowledge to produce the extrants required to achieve strategic objectives previously defined by the organization (St-Amant and Renard, 2005, p. 12).

3.2 Organizational Capabilities Development Framework

St-Amant and Renard (2005) developed a framework for managing *the development of organizational capabilities associated with technological management, see figure 1.* According to the authors, two management fields need to be mastered in order to manage the development of organizational capabilities: *problem resolution management* and *knowledge management*. These two fields are strongly interrelated. A bilateral relationship exists between the evolution of organizational capabilities and managing the development of organizational capabilities.

3.3 Organizational capabilities repository

An organizational capabilities repository is a structured body of knowledge associated with organizational capabilities required to implement a strategy. The term "Knowledge repository" is used in the field of information systems to designate a "data base that brings together, in a semantic network, a set of specialized information associated to the activities of a firm or organization which can be consulted by its members" [1]. The term is also used to refer to a structured set of information that aims to produce exhaustive knowledge associated to a field or project, whose use is shared among a group and often supported by query and extraction tools. Therefore, a repository refers to an organized collection of standardized organizational knowledge that guides and prescribes rational action by facilitating learning, communication, cooperation and collective learning. The « *Project Management Body of Knowledge* » (PMBok), for example, is a knowledge repository associated to project management[2].

A repository makes the abovementioned elements available in a codified mode. It is a very important element of organizational learning. It enables the organization to act collectively around a common and easy to share understanding (Nonaka and Takeuchi, 1997) of the problems that need to be resolved (Zollo and Winter, 2002). It also enables coordination and implementation of complex activities (Zollo and Winter, 2002). In addition, the repository supports the creation of new knowledge. All this aims to develop an organizational context that promotes the development of organizational capabilities required to achieve the strategic objectives. When an organization chooses to deploy a strategy, it must then necessarily create an initial repository, in other words, a reference model of organizational capabilities required to achieve its goals. This corresponds to an initial attempt to codify knowledge that is pertinent to the organization.

Creating the initial repository can be achieved by inventorying knowledge that is explicit, that is, codified knowledge that is available to everyone through books, scientific articles and research reports. Knowledge can also be obtained from the field by means of individuals whose experiences are linked to the research domain. However St-Amant and Renard (2005) acknowledge that the repository of organizational capabilities for technological management they have developed has an important limit, as each organization must adapt this normative repository. Indeed, even if the model is elaborated based on practices generally accepted and on contemporary scientific knowledge, it remains theoretical since it cannot take into consideration each organization's particular context. Each organization reinterprets the repository to generate its own with the appropriate body of knowledge, specific know-how and competencies suited to its context.

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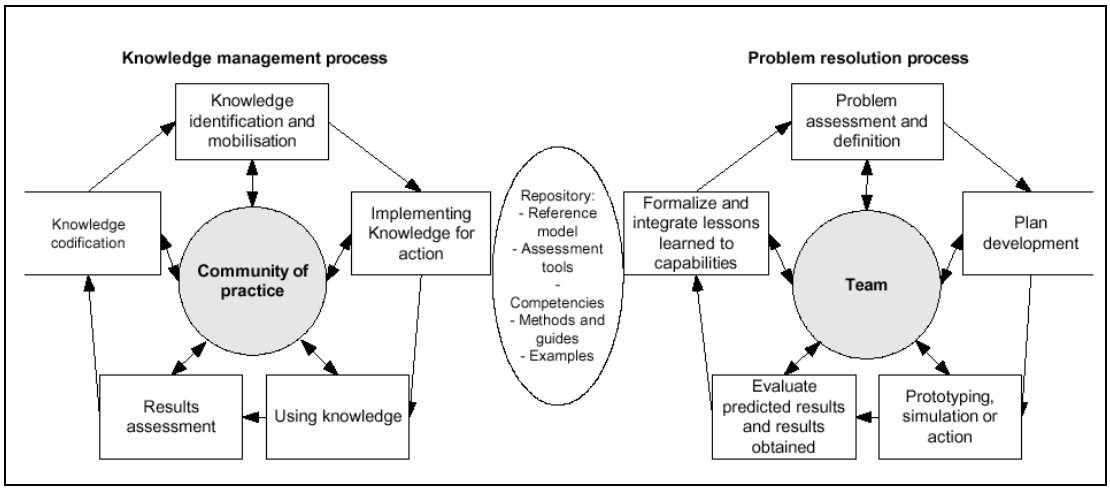

Figure 1 **-** Organizational Capabilities Development Framework (St-Amant & Renard, 2005, page 10)

4.0 Goals and objectives of this research project

In studying Web-based Distance Learning projects, it has become apparent that it is necessary to study how the adult learners structure their learning, how they proceed with it, how they change their approach when faced with different learning activities such as case studies, group decision-making or problem solving, in order to successfully and efficiently work together to achieve the learning objectives. In practical terms, what skills should adult learners possess in order to facilitate their learning experience within the context of a collaborative learning assignment in order to improve the retention rate during distance training? Consequently, this research project has defined four specific objectives:

1. The first objective is to catalogue the skills required of adult learners in working together to attain a common objective.
2. The second objective is to catalogue the skills required of instructors in guiding the adult learners using the collaborative learning approach.
3. The third objective is to examine the principal organizational requirements needed to support adult learners and instructors using collaborative learning in Web-based Distance Learning.
4. The fourth objective of this project is to prepare, to assess and to distribute a repository of knowledge related to the individual skills and organizational needs of collaborative learning in the area of Web-based Distance Learning.

We are of the opinion that the establishment of this repository will benefit the adult learners as well as the instructors and the teaching establishments. As a result, this repository will show adult learners how to use the skills they will need in order to achieve a learning objective using collaborative learning. Instructors will be better prepared to explain to adult learners the elements of and the skills related to collaborative learning. Finally, teaching establishments will be able to provide the necessary support structure to the instructors and the adult learners in order to reach the goals of Web-based Distance Learning.

5.0 Methodology

The research project includes a five step process which is described next:

Step 1: Data collection based on an inductive methodology: an analysis of needs and problems encountered in carrying out a collaborative work in a distance learning context.
Step 2: Analysis of results obtained based on the theoretical literature on the topic.
Step 3: Elaboration of a first version of the repository.
Step 4: The use and evaluation of the first version of the repository.
Step 5: Improvement of the first version of the repository and reiteration of phase 4 (step 4).

The five steps of the research can be represented graphically as illustrated in the following:

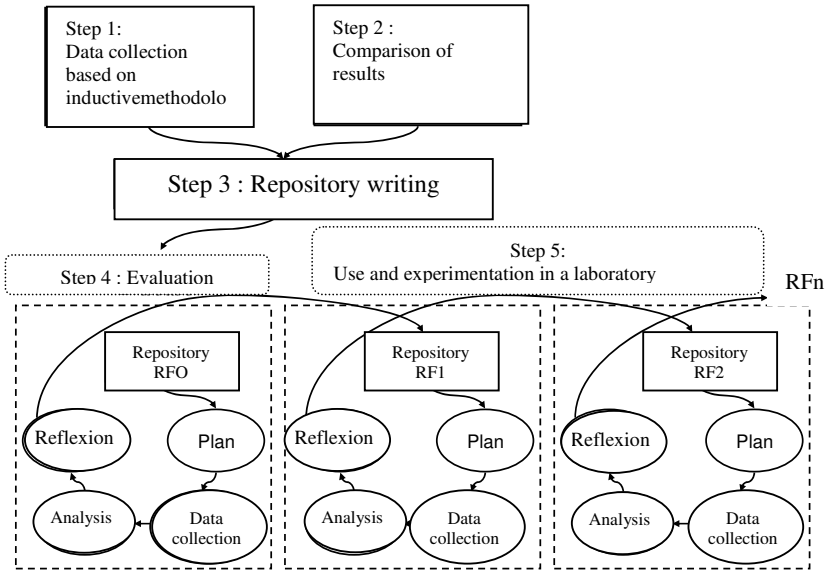

Figure 2: The five step of the research

5.1 Step 1: Inventory of requirements and obstacles in the creation of the first knowledge repository

In the summer of 2006, 20 (13 females and 7 males) students enrolled in the distance learning course, *Principales problématiques en éducation* (a graduate level course) participated in the creation of the *first knowledge repository*. In order to collect the needs and problems experienced by the students who were enrolled in the online course, we developed a grid to track the development of organizational capacities; for the management of group work at a distance. The grid was composed of these questions:

- Quels problèmes avez-vous rencontré lors de vos travaux de groupes ?
- What problems have you encountered during your group work?Comment avez-vous réussit à les régler ?
- How did you manage to resolve these problems?
- Quels outils informatiques avez-vous utilisés pour faire vos travaux et à quels moments ?
- Which electronic tools did you use to do your work and at what point?

5.2 Step 2: Analysis of results obtained based on the theoretical literature on the topic

The analysis of problems experienced by adult learners in the process of collaborative learning points to urgent changes in three skill areas:

1. Information technology skills (How to use WebCT, Skype and Bridgit);
2. Operational skills (setting up basic operating procedures, answering e-mail within 24 hours, conventions of politeness and respect (netiquette));
3. Interpersonal skills
    - 3.1. Flexibility and availability;
    - 3.2. Punctuality by all participants;
    - 3.3. Commitment to understanding the group assignment;
    - 3.4. Commitment to the assignment and respect for deadlines;
    - 3.5. Respect for the guidelines of verbal communication: active listening, respect for the opinion of others and listening without interruption.

In light of the comments and informed by the literature in the domain, the first version for the knowledge repository was elaborated.

5.3 Step 3: Elaboration of a first version of the repository

As a result of a primary analysis of requirements, four guidelines have been constructed:

1. Guideline A: Forming an effective working group

The first guideline is comprised of five sections:

- 1.1 Using the Course Forum to solicit potential group members;
- 1.2 Selecting appropriate respondents to form a group;
- 1.3 Choosing a group coordinator;
- 1.4 Exchanging information about us;
- 1.5 Formally advising the instructor by e-mail of the names of members of the group.

2. Guideline B: Operation of a successful group discussion

The second guideline is comprised of seven sections:

- 2.1 Welcoming the participants to the group;
- 2.2 Socializing (to break the ice);
- 2.3 Discussing the requirements for a successful group;
- 2.4 Understanding the role of the chairperson and of the secretary in the discussions and the role of emitter and receptor in group discussion.
- 2.5 Accepting certain rules of team work for the conference: conventions of politeness and respect and techniques for effective group work;
    - 2.5.1 Part B.5: How to work within a group;
- 2.6 Discussion of a plan for evaluating the work already accomplished;
- 2.7 Agreeing on an agenda for the next group discussion.

3. Guideline C: The first group discussion

The third guideline is comprised of two sections

- 3.1 Convening the first conference;
- 3.2 Moderating the first conference: agreeing to a formula for a group effort.

4. Guideline D: Agreeing on an effective group working plan

The fourth guideline is comprised of four sections:

- 4.1 Agreeing on the objectives for the successful completion of the assignment;
- 4.2 Discussing the working principles of a group discussion;
- 4.3 Discussing the steps in the completion of the group assignment;
- 4.4 Discussing the writing up of the group assignment

La prochaine étape consiste donc à l'évaluation of the first version of the repository. The next step consists of evaluating the first version of the repository.

5.4 Step 4: The use and evaluation of the first version of the repository.

5.4.1 Participants

Our participants were Franco-Ontarian teachers and school principals who were enrolled in the Masters in School Administration Program at the Faculty of Education, University of Ottawa. In the winter of 2007, 18 (10 females and 8 males) enrolled in the distance learning course, *Principales problématiques en education* (a graduate level course) were invited to use the first version of the knowledge repository to execute their group work and to evaluate it.

5.4.2 Measurement instruments

For the evaluation of the first version of the repository, we constructed the *Evaluation of guidelines* questionnaire which included first, demographic questions designed to profile the study participants (e.g, number of online courses previously taken); second, respondents evaluated the four guidelines according to the following components:

a) **learning** (À la lecture du contenu de ce guide, j'ai appris des choses) ;
b) **putting into practice elements of the guidelines** (À la lecture du contenu de ce guide, j'ai (nous) mis en pratique des éléments de ce guide pour exécuter le travail de groupe) ;
c) **attaining the objectives** (Ce guide m'a (nous) aidé à atteindre les objectifs de ce travail de groupe).
d) **usefulness** (Ce guide me – nous sera utile pour mes future formation à distance)

Le choix de réponse à chacune des questions était on a four-point scale (1- disagree strongly to 4- agree strongly) .

6.0 Results

6.1 Analytical methods

We examined the quantitative data in light of response percentage frequency distributions. The statistical analyses were conducted using SPSS software. We employed the qualitative and inductive methodology developed by Glaser and Strauss (1967) to analyze interview data.

6.2 Profil of respondants

The data presented in Table 1 indicate that 66.7% of students enrolled in the distance learning course had already taken two or more distance learning courses. Equally, the data in Table 2 and 3 indicate that only 22% of students did not previously know other students before starting the online course.

Table 1 : Number and percentage of distance learning courses taken BEFORE this course

Cours	Number (n)	Percentage(%)
0	3	16.7
1	3	16.7
2 to 4	6	33.3
5 to 7	5	27.8

8 or more	1	5.6
TOTAL	**18**	**100**

Table 2: Number and percentage of students who knew a member of their work group BEFORE starting the course

Members	Number (n)	Percentage (%)
None	4	22.2
1	9	50.0
2	2	11.1
3	3	16.7
TOTAL	**18**	**100**

6.3 Evaluation of the First version of knowledge repository : Quantitative data

The data in Table 3 show that on a maximum of 4 points, in generally, the students indicated being in agreement with the statement that they learned something with the four guidelines. However, they were more in agreement with statements pertaining to the following: putting into practice certain principles from the guidelines, helped in achieving the objectives of the required work, and usefulness for their distance learning. Moreover, of significance according to the Pearson correlation analysis is the link students made between the statements, specifically a) I learned things in relation with this work, b) I put into practice elements of this guide, c) helped me achieve the objectives of this work, and d) is useful for my distance learning. The results in Table 4 support this assertion.

Table 3: Mean and standard deviation by guide and by sub-questions

	a) Learn			**b) Put into practice**			**c) Achievement of objectives**			**d) Usefulness**		
	n	Mean	SD	n	Mean	SD	n	Mean	SD	N	Mean	SD
Guideline A	18	3.14	0,87	18	3,46	0,56	17	3,46	0,50	18	3,50	0,54
Guideline B	18	3.04	0,76	18	3,27	0,55	18	3,26	0,56	18	3,24	0,60
Guideline C	18	3.03	0,81	18	3,44	0,66	18	3,36	0,70	18	3,42	0,67
Guideline D	18	3.07	0,83	18	3,38	0,60	18	3,39	0,61	18	3,32	0,64
Mean :	18	**3.07**	**0,74**	18	**3,40**	**0.47**	17	**3,38**	**0,49**	18	**3,36**	**0.54**

Table 4 : Pearson correlations by sub-questions

	a) Learn	**b) Put into practice**	**c) Achievement of objectives**	**d)Usefulness**
a) Learn	1	0.889(**)	0.859(**)	0.848(**)
b) Put into practice	0.889(**)	1	0.940(**)	0.923(**)
c) Achievement of objectives	0.859(**)	0.940(**)	1	0.972(**)
d) Usefulness	0.848(**)	0.923(**)	0.972(**)	1

** The correlation is significant at the 0.01 level (bilateral).

6.4 Evaluation of the First version of knowledge repository : Qualitative data

Because we receive few negative comments, we did not analyse the data with the inductive methodology developed by Glaser and Strauss (1967). Toutefois, qualitative data reveals that

the majority of learners appreciated the guides. We present some comments. Their comments are quite eloquent for each guideline.

Guideline A : Forming an effective working group

"This process is essential in order to begin the work effectively. It is very important to gather basic information about the group members in order to understand the strengths and the skills of each one.

"The fact that we each have a different job in the field of education allows each of us to better understand the daily experience and the responsibilities of each member of the group."

" I discovered that Guideline A really helped me in choosing the other group members. I have worked in groups in the past but a Distance Learning Course imposes restraints which this Guideline reminded me about concerning the makeup of the group.

Guideline B: Operation of a successful group discussion

"This guideline described excellent strategies and suggestions for effective group work. It will be very useful for me in several other areas of my job, and not only in my Masters course. Thank-you and congratulations. On the other hand, section 2.6 is overly detailed. The section on verbal communication is excellent."

Guideline C: The first group discussion

"The section dealing with the suggestions for effective group work is useful not only for the course, but useful elsewhere as well.

"The idea of optional self-assessment by the learner is excellent. Each participant can then present a defence for the work he or she has done. It is then possible, if the group assents, to send this self-assessment to the instructor."

Guideline D: Agreeing on an effective group working plan

"Overall, Guideline D was useful in the tasks and in the way that work was shared by different members of the group.

"I believe as well in the importance of having a template for effective labelling of our files because it is very useful in making corrections. (I was a Teaching Assistant and it is absolutely necessary for students to follow the prescribed format)."

7.0 Discussion and Conclusion

This paper presents the preliminary results of the first year of two years of research project. The small number of respondents circumscribes the significance of the results. However, preliminary results confirm that the first version of the knowledge repository is useful in helping learners enrolled in a distance learning course. Also, data suggest that learners are in agreement and confirm that the guidelines offered in the knowledge repository facilitated the achievement of assignment objectives and were useful for their online learning.

With regards to the technologies utilized, the analysis of data indicates that the groups used telephone conferencing to exchange more effectively between members. This practice, however, had associated costs. Hence, to compensate for limited computer resources offered by the university for Web-based Distance Learning, it is essential to offer learners an « electronic desktop », that is, a guide of electronic tools offered in French and capable of being used free of charge, tools such as *Enjeux-S* (Villardier, Probst, and Sauvé, 2006), *Breeze*, etc.

This « electronic student desktop » would be accompanied by references on how to use them efficiently. This « electronic student desktop » will be developed by the researchers from ITI, National Research Council Canada.

The next steps in the research consiste donc à analyser toutes les réponses des apprenants afin de créer la deuxième version of knowledge repository (Step 5). Cette deuxième version contiendra davantage des fiches faciles à utiliser pour les apprenants. We hope to offer more sections that are better adapted to the needs of the learners, the school principals, teachers and the organization. Cette deuxième version of knowledge repository will be use in January 2008, by two groups of students (teachers and school principals) enrolled in the distance learning course, graduate level course.

Acknowledgements
We sincerely thank the Canadian Council on Learning for support granted.

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