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Supporting Continuous Professional Learning in the Academic Staff through Expertise Sharing

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Abstract

This article reports a small-scale experiment of a strategy designed to support the sharing of academic expertise at a Distance Learning University. Two small and separate groups of academic staff members (one of four professors and one of five instructional designers, both including experienced and new employees) volunteered to meet regularly, over a one-year period, to elaborate a collective knowledge map representing a portion of their professional knowledge. This tool- and peer-mediated mentoring activity created a professional learning context in which participants were encouraged to externalize and thus share some tacit knowledge developed through professional practice, as well as explicit but sometimes ambiguous organizational knowledge. The data analyzed so far includes audiotaped individual interviews conducted before and at the end of the experiment, audiotaped group debriefings at the end of each meeting and the knowledge map constructed in each group. Results suggest that combining group mentoring with collaborative knowledge modeling is a promising strategy to foster the elicitation of professional expertise and thus support the professional development of academic staff in universities. This strategy can be defined as an intentional but non-formal professional learning activity that fits well with conceptualisations of learning at the workplace as both a knowledge participation process and a knowledge creation process.

Keywords
professional learning of academic staff; group mentoring; collaborative knowledge modeling; sharing and transfer of expertise

Apoyar el desarrollo profesional continuo del personal académico a través del intercambio de experiencias

Resumen
Este artículo expone un experimento a pequeña escala sobre una estrategia diseñada para apoyar el intercambio de experiencias académicas en una universidad de educación a distancia. Dos pequeños grupos independientes compuestos por personal académico (uno con cuatro profesores y otro con cinco diseñadores de contenidos educativos, ambos con empleados con y sin experiencia) se ofrecieron voluntarios para reunirse periódicamente durante un período de un año para elaborar un mapa de conocimientos colectivos que representara una parte de sus conocimientos profesionales. Esta herramienta y actividad de tutoría entre compañeros de trabajo estableció un contexto de aprendizaje en el que se potenció que los participantes exteriorizaran y compartieran algunos conocimientos tácitos desarrollados a través de su práctica profesional, así como determinados conocimientos organizativos explícitos aunque algunas veces ambiguos. Los datos analizados hasta el momento incluyen la grabación de las entrevistas realizadas a cada participante antes y después del experimento, la grabación de las conclusiones al final de cada reunión y el mapa de conocimientos elaborado por cada grupo. Los resultados sugieren que combinar las tutorías de grupo con la modelización de conocimientos colaborativos es una estrategia prometedora para promover la adquisición de experiencias profesionales y por lo tanto apoyar el desarrollo profesional del personal académico en las universidades. Esta estrategia puede definirse como una actividad de aprendizaje intencional pero no formal que se adecua a las conceptualizaciones de aprendizaje en el lugar de trabajo a la vez como proceso de intercambio de conocimientos y proceso de creación de conocimientos.

Palabras clave
desarrollo profesional del personal académico; tutoría de grupo; modelización de conocimiento colaborativo; intercambio y transferencia de experiencias

Problem Statement and Objectives

As in many other organizations in western countries, Canadian universities are currently facing a high employee turnover due to the retirement of post-World War II baby-boomers (AUCC, 2007). Thus, the integration of large cohorts of new faculty and other academic staff members represents a great challenge for universities. To take up this challenge successfully, new employees should be supported in their efforts to embrace the academic culture of their universities and to optimize their professional development through their work practices. One way to accomplish this is to support the intergenerational transfer of academic expertise (Bratianu, Agapie, Orzea & Agoston, 2011; CSÉ, 2003), by encouraging experienced and new employees to meet regularly to discuss their work practice, in the hope that the former will externalize some of the tacit knowledge developed during their university careers and that the latter will learn from them. Conversely, these meetings can be occasions for newcomers to express fresh ideas that may lead to a re-evaluation of some encrusted rules and can instil innovative practices in the university.

With this aim of supporting expertise sharing and transfer (especially of tacit knowledge related to expertise), a pilot experiment was conducted with two separate small groups of employees in a French Canadian Distance Learning University. This paper presents the strategy designed to this end, which combines group mentoring and collaborative knowledge modeling. It also reports some research results investigating how it supports the elicitation of professional knowledge and the professional development of academic staff.

Rationale of the Strategy Used to Support Expertise Sharing

To support professional expertise sharing, tacit knowledge needs to be externalized in some way. However, research has shown that experts have considerable difficulty verbalizing what they know and explaining their models of action (Sternberg & Horvath, 1999). Experts have developed highly organized mental structures, integrating procedural as well as declarative and strategic knowledge (Chi, Feltovitch & Glaser, 1981; Ericsson & Charness, 1994; Glaser, 1986; Sternberg, 1997). This knowledge becomes 'encapsulated' with experience (Boshuizen & Schmidt, 1992; Hakkarainen, Palonen & Paavola, 2002) and is, consequently, very difficult to verbalize.

A possible solution to approach this problem consists of creating situations where experts can co-construct a structured external representation of knowledge related to their professional practice in concert with novices. This requires two conditions: an opportunity to interact verbally in the context of their professional activity and a means to trigger the externalisation of the experts' knowledge, as well as that of the novices' internal representation of professional practices in their fieldwork. We propose that group mentoring combined with collaborative knowledge modeling offers abundant potential for this purpose.

Mentoring is usually defined as a relatively long-term relationship between a knowledgeable individual (the mentor) and a less experienced person (the mentee), the former providing information, advice and encouragement to the latter with the aim of fostering his or her personal and professional development. Group mentoring is a form of mentorship "in which the mentoring function is supplied by a more or less tightly constructed group of professional colleagues" (Ritchie & Genoni, 2002, p. 69). Research has shown that successful mentoring relationships can assist individuals in "learning the ropes" at the workplace (Goodyear, 2006). Many cases have documented one-to-one mentoring programs implemented in universities, especially for faculty (Bernatchez, Cartier, Bélisle & Bélanger, 2010; Cawyer, Simonds & Davis, 2002; Feldman, Arean, Marshall, Lovett & O'Sullivan, 2010; Foote & Solem, 2009; Knippelmeyer & Torraco, 2007; Langevin, 2007). However, group mentoring is still rarely implemented in the academe (Moss, Teshima & Leszcz, 2008).

Collaborative knowledge modeling consists of elaborating a collective graphical representation of some part of a knowledge domain in a node-link format. Nodes represent the knowledge entities (identified with short textual labels) and links represent the semantic relationships established between the knowledge entities. A variety of terms is used to refer to this type of external representation of knowledge (knowledge map, concept map, knowledge network, mind map, etc.), although these can differ substantially in terms of the knowledge mapping language used to develop them (Basque, 2012; Davis, 2011; Eppler, 2006).[1] Software tools supporting the elaboration of such external representations have been described as 'cognitive tools' or 'mindtools' (Dabbagh, 2001; Jonassen & Marra, 1994; Komers, Jonassen & Mayes, 1992) and 'metacognitive tools' (Novak, 1990). Many studies conducted in different formal educational settings demonstrate that creating such graphical knowledge representations in groups can be beneficial to learning (Basque & Lavoie, 2006; Gao, Shen, Losh & Turner, 2007). It has also been proposed as a strategy to support the elicitation of expert knowledge and transfer of expertise in organizations (Basque, Paquette, Pudelko & Léonard, 2008; Coffey, 2006; Coffey & Hoffman, 2003; Moon, Hoffman, Novak & Cañas, 2011). However, to our knowledge, no research has yet examined the potential of this strategy to support the sharing of professional expertise in universities.

Description of the Context and of the Strategy

Participants

Two small groups of academic staff members working in a Distance Learning University (one of four professors and one of five instructional designers, both including experienced and new employees) volunteered to meet regularly to participate in the pilot experiment. The first group (Prof Group) included two experienced professors (with 30 and 13 years of academic experience, respectively) and two newcomers (with less than one year of academic experience at this university) in the same discipline. The second group included five instructional designers (ID Group) working in different disciplinary departments. The main task of these instructional designers consists of assisting the professors in designing their courses. One of them has worked at the university for more than 20

1. The terms 'knowledge model', 'knowledge map' or simply 'model' or 'map' are used in the remainder of this paper to refer to the product of a collaborative knowledge modeling activity.

years and the others from two to six years. In this project, the title of 'experts' has been reserved for participants with more than 10 years of experience at the university. Those who have garnered between three and 10 years of experience are called 'intermediate' and those with less than three years 'novices'. Table 1 shows the number of participants at each level of expertise in each group.

Table 1. Number of Participants at Each Level of Expertise in Each Group

Level of Expertise	Prof Group	ID Group
Expert	2	1
Intermediate	0	1
Novice	2	3
Total	**4**	**5**

The Collaborative Knowledge Modeling Tool Used

The knowledge map is elaborated with the *G-MOT* software tool developed at the LICEF Research Center (www.licef.ca), which implements an object-typed modeling technique (called MOT[2]) developed initially for Instructional Design purposes by Paquette (2002; 2010). This technique differs from usual concept mapping techniques in that it requires the user to identify the types of knowledge entities and the types of link represented on the map. Knowledge entities include *concepts* (conceptual knowledge), *procedures* (procedural knowledge), *principles* (strategic knowledge), *facts* (factual knowledge) and *actors* (agency knowledge), which are distinguished by different shapes. The link types (represented by their first letters on the map) include: *Composition, Specialisation, Precedence, Regulation, Instantiation* and *Input/Product*. Additionally, a set of semantic rules defines the valid links that can be established between different types of knowledge entities. For example, a *Specialisation* link (A is 'a sort of' B) can only be established between two knowledge entities of the same type. If the user draws a link that does not conform to the semantic rules, the software will automatically display a default link, that is, the most probable one considering the types of the knowledge entities involved. If the user disagrees with the suggested link, a right-click on the link enables him/her to select another one from the pool of valid links displayed. Among other interesting *G-MOT* features, we can mention that users are able to create 'sub-maps', each connected to a knowledge entity appearing in one or other of the upper layers of the map. Furthermore, various types of files and URLs can be attached to knowledge entities, which can then be easily accessed when consulting the map. *Comments* (frame-free texts) can also be linked to nodes or links.[3]

We think that the MOT language implemented in the *G-MOT* software offers a kind of "representational guidance" (Suthers, 2003) that is particularly useful to support the elicitation of tacit

2. MOT is a French acronym for *Modélisation par objets typés*.
3. For more information on the software and the technique, see Paquette (2010). The G-MOT software can be downloaded freely at the LICEF website (http://www.licef.ca/index.php/realisations/produits). The English version of the software is available in the "Preferences" menu.

knowledge called upon in professional practice. Indeed, professional actions are defined in *nodes* (that is, as knowledge entities of a procedural type) on the map, rather than in *links* as is the case in other knowledge mapping techniques. This feature opens the possibility to break down a main professional action into 'sub-actions' (using the *Composition* link) and/or to specify different types of 'sub-actions' (using the *Specialisation* link) that can be taken to perform the main action. It also invites the user to specify other types of knowledge entities, apart from procedural knowledge, that are involved in the professional action and sub-actions: (1) the actors performing them (*agency knowledge*), who are linked to actions and sub-actions with the *Regulation* link; (2) the internal and/

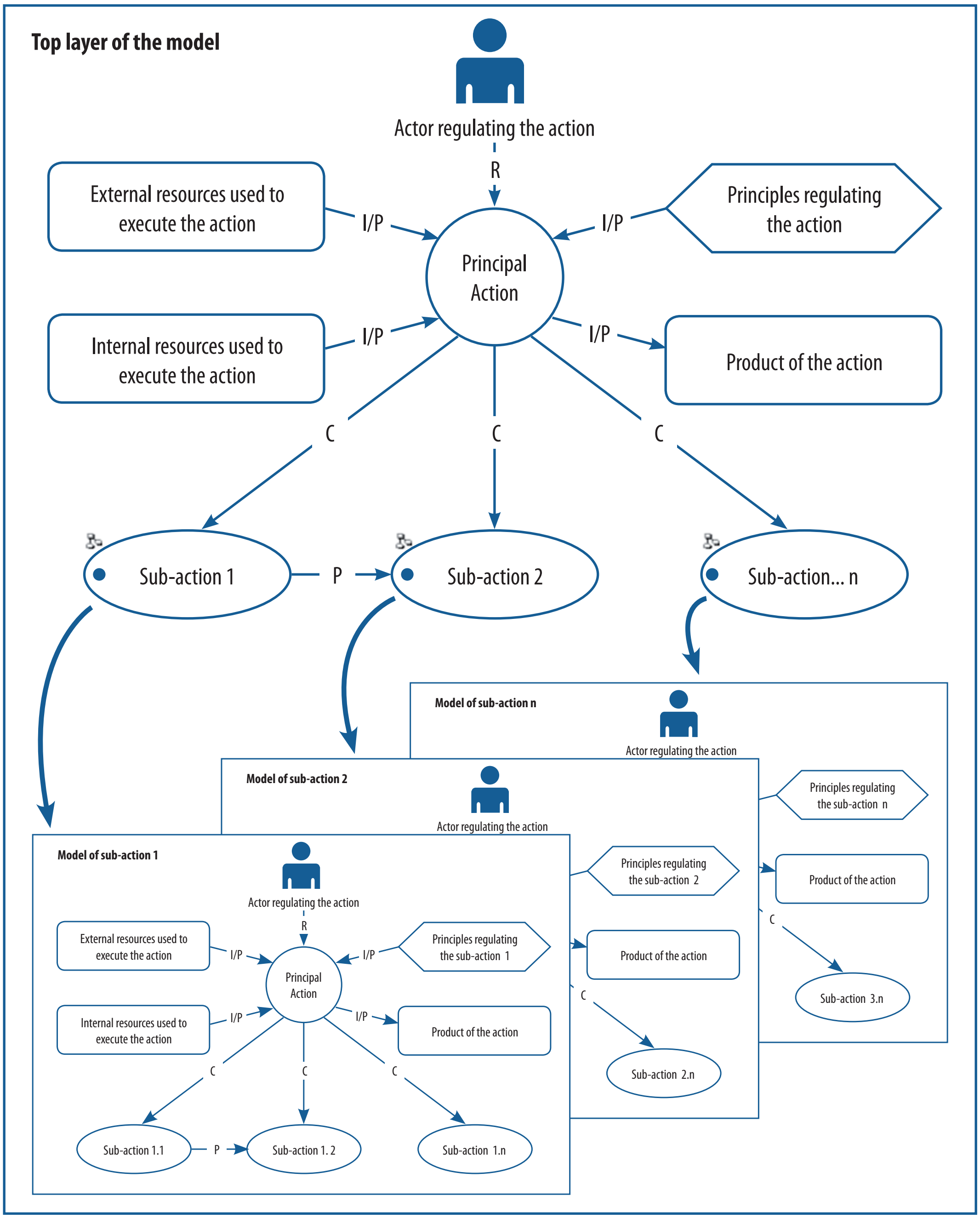

Figure 1. Generic representation of an 'action knowledge structure' in G-MOT

or external resources used to perform them, as well as the products resulting from their execution (*conceptual knowledge*), which are linked to actions and sub-actions with the *Input/Output* link; (3) the principles or rules applied when performing them (*strategic knowledge*), which are linked to actions and sub-actions with the *Regulation* link. Figure 1 shows how these different types of knowledge entities can be represented graphically on a *G-MOT* map. We think that this generic model of what could be called an 'action knowledge structure' can act as a powerful mediator of the cognitive activity of the knowledge modeller when creating the map (Basque, 2012; Pudelko, 2006), and of social interactions when this activity is done collaboratively (Basque & Pudelko, 2009).

Procedure

Before the beginning of the pilot experiment, all the participants were asked individually to specify an aspect of their professional practice they would like to see elicited on the collaborative knowledge map of their respective group. They all chose to represent the knowledge deployed through the instructional engineering process of a distance course at the university. They were also informed that the project would probably require them to participate in a minimum of 10 half-day meetings (once a month or every two months, depending on their availability), but that their group would be free to withdraw at any moment or to continue after 10 meetings.

In June 2010, the Prof Group held its first meeting and, in September 2011, it had its 10th meeting; the participants agreed that this would be the last one. Overall, this group met for 23 hours and 13 minutes, each meeting lasting an average of 2 hours and 15 minutes. The ID Group had its first meeting in June 2011 and its 10th in March 2012. In this group, participants decided to continue for three additional sessions. They met for a total of 32 hours and 28 minutes, each meeting lasting an average of 2 hours and 30 minutes.

Since participants' work sites are located in two different cities, videoconferencing (and, for some meetings, telepresencing) equipment was used so that they could hear and see each other. Discussions were moderated by one of the participants familiar with the MOT technique. The author of this paper acted as the discussion moderator and as an active participant in the Prof Group. She also participated in the ID Group as an observer and as a supporter of the designated moderator[4], since the latter had not led this kind of group activity before. In both groups, a Ph.D. student used the software tool and progressively constructed the map based on the group discourse. All the participants could visualize the progression of the map's construction, since it was projected on a large screen at both sites. Each of them could intervene at any time to suggest changes to the map. However, consensus had to be reached within the group to transfer them to the map.

During the sessions, discussions were very intense. Thus, it was sometimes difficult to capture such richness on a map 'on the go'. To overcome this difficulty, meetings were digitally audiotaped. The author of this paper listened to the recording between each meeting and, when necessary, added elements that had been verbalized during the meeting but were not represented on the map.

4. As one of the instructional designers working at the university, this designated moderator also acted as an active participant in the collaborative knowledge modeling sessions of the ID Group.

She was also able to suggest reformulations of some of the map's content and, occasionally, some restructuration at one level or another of the map.

The sequence of each meeting followed the same pattern: (1) the moderator briefly reminded the participants of the work done in the previous session; (2) she validated with the group the modifications brought to the map after the last session and pinpointed parts that had yet to be elaborated or those that needed to be clarified; (3) the participants made a decision on what part of the map would be developed or revised during the session; (4) the group worked on the elaboration or revision of the selected parts of the map; (5) a short debriefing period (5-15 minutes) concluded the session. After the session, the map was made accessible to the group through a web content management system recently implemented at the university (*Microsoft SharePoint*).

Data Collection and Analysis

The following data were collected in both groups using a qualitative research methodology: (1) audiotapes of interviews conducted with each participant before and after the experiment[5]; (2) audiotapes of the meeting discussions; (3) the elaborated map; (4) audiotapes of the debriefings.

Verbal data were coded using the qualitative data analysis software *NVivo* (QSR International) and a semi-emergent coding approach. We used the main and secondary categories of a coding scheme elaborated in previous projects conducted in non-academic organizations (Basque, Desjardins, Pudelko & Léonard, 2008; Basque, Paquette, Pudelko & Léonard, 2008; Basque & Pudelko, 2010; Paquette, Léonard, Basque & Pudelko, 2010) and revised them progressively throughout the coding of the new field data.

Additionally, *Excel* reports of all the knowledge entities (nodes) of each type contained in the final maps were automatically generated with the *G-MOT* software.

Results

Four main research questions are examined in this project: (1) Did the strategy support the elicitation of professional knowledge?; (2) Did learning occur?; (3) Did learning transfer in work practices occur?; and (4) What factors can affect the feasibility and efficiency of the strategy? In this paper, we address the first two research questions.

Elicitation of Professional Knowledge

Table 2 gives the number of knowledge entities of each type appearing on the final map for each group after 10 meetings, and for the ID Group after 13 meetings. This table shows that the maps

5. As one of the participants of the ID group is on sick leave since the end of the experiment, one post-experiment interview had yet to be conducted.

produced by both groups are quite similar in terms of proportion of knowledge entities of each type. Interestingly, strategic knowledge, which is at the heart of professional expertise (Kavakli & Gero, 2003), is the most represented on the maps of both groups. Indeed, slightly more than half of all the knowledge entities represented are identified as *Principles*. Procedural knowledge (*Procedures*) and conceptual knowledge (*Concepts*) are represented in similar proportions in both groups, i.e., one fifth of the knowledge represented.

Agency knowledge (*Actors*) is less present on the maps. This is not surprising given that participants were asked to describe their *own* practices so that all the procedures represented on the map were 'regulated' by a single actor, that is, an actor labelled 'Professor' in the Prof Group and an actor labelled 'Education Specialist'[6] in the ID Group. According to the inheritance principle integrated in the MOT technique, an actor linked to a procedure is considered linked to all of its sub-procedures and thus does not need to be repeated on every sub-map linked to the top procedure. Nevertheless, in 'mono-actor' models such as the one elaborated by the groups (that is to say, models representing the perspective of a single type of actor on his/her professional work), it is sometimes interesting to represent the main actor not only as an agent regulating the procedures, but also as an agent linked to a network of other actors. This last approach has been used in both groups. Thus, the actors (individuals, teams or departments) with whom the professors (in the Prof Group) and the instructional designers (in the ID Group) interact through the instructional engineering process of a course have been identified in a specific sub-map representing the taxonomy of all these actors. Both groups identified more than twenty of them defined by their respective role. This reflects the fact that the instructional engineering process in this Distance Learning University requires the participation of many departments and employees.

Table 2. Number of Knowledge Entities Represented on the Map of Each Group of Participants after 10 Collaborative Knowledge Modeling Sessions

Types of Knowledge Entity	Prof Group After 10 Sessions		ID Group After 10 Sessions		ID Group After 13 Sessions	
	N	%	N	%	N	%
Strategic knowledge (*Principles*)	325	51	374	54	477	58
Procedural knowledge (*Procedures*)	131	21	121	18	125	15
Conceptual knowledge (*Concepts*)	129	20	155	22	173	21
Agency knowledge (*Actors*)	30	5	24	3	25	3
Factual knowledge (*Facts*)	20	3	15	2	19	2
TOTAL	635	100	689	100	819	99*

* The sum does not add up to 100% as figures were rounded up.

6. This is their official job title at the university, but it could have been labeled 'Instructional Designer' as well, if we consider the role they play in this institution.

Factual knowledge (*Facts*) is not very present on the maps. We recall that knowledge entities of this type are instances of other types of knowledge entities. Due to time constraints, the participants focussed their efforts primarily on identifying strategic, procedural and conceptual knowledge deployed through their instructional engineering practices. Adding factual knowledge and attaching resources (files or URLs) to knowledge entities was considered an activity that could be performed during a second stage of the project.

In addition to eliciting knowledge entities during the collaborative knowledge modeling sessions, participants expressed several recommendations or questions concerning the organizational processes governing their work that they deemed ineffective. These recommendations were reported in *Comments*, in order to eventually transmit them to some instances in the academic institution. The Prof Group identified more than 60 comments of this type while the ID Group identified 51. The comments voiced by the academic staff may represent a significant contribution to the improvement of work processes in the university if, that is, the administrative authorities take full advantage of this input to re-examine the organizational work rules and processes and engage in a productive dialogue with the different groups of professionals.

These quantitative data show that the knowledge maps developed by both groups are quite elaborate. Both include more than 600 knowledge entities after 10 sessions. In fact, several participants were surprised by the amount of knowledge that they had been able to spell out through the different layers of the map:

> *When you open the sub-models, it's like 'Wow!' I find it rewarding […]. It really shows the great quantity of work we have generated. […]. I am impressed.* (Intermediate, ID Group, Meeting 10)[7]

Actually, some even felt that the knowledge entities were too numerous in certain layers of their map, and that it would be best to effect some reductions, or at least to transfer some knowledge entities into sub-maps, in order not to 'scare away' new employees who would eventually access the map:

> *That is one of the challenges pertaining to sharing our work with colleagues. Indeed, we must not frighten people who are presented with this complex model we have designed, as they could feel overwhelmed and sense that 'there are far too many components in there: I'll never make it!' This is the drawback of having spelled out such a quantity of elements… to have rendered the knowledge much more explicit.* (Novice, Prof Group, Final interview)

Several participants commented that, in their view, the collaborative knowledge modeling activity combined with that of the mentoring group facilitated the elicitation of knowledge related to their professional practice. The following are two examples:

> *It really allows us to focus on the essential knowledge. It provides a way to structure it all; it facilitates discussions and yields a clear, structured vision of it.* (Novice, Prof Group, Final interview)

7. All the participants' comments were expressed in French. They have been translated into English for this paper.

> *The work is conducted on two levels […]. On the one hand, you can discuss work practices with colleagues […]. On the other hand, you have the product of such interaction: the model […]. I find it rather interesting that we combine both. If you only had the discussions […], the danger would be that, at some point, people would say: 'Look, we're not getting anywhere. We don't have a finished product.' In our case, throughout our discussions, we are consistently asking: 'Where does this fit into the model?' […] Hence, the fact that there is a product to work on allows one to remain focused on the task and it provides a concrete reference point that can be consulted after the meeting.* (Novice, Prof Group, Final interview)

However, the participants raised interesting questions and reservations about the knowledge maps they elaborated. A lack of space prevents us from reporting them all and discussing their implications in this paper. Thus, we shall address only two of the issues reported here, from the perspective that the project aims to promote the professional development of new employees in the university.

The first issue can be stated as follows: What is the nature of the knowledge that the participants should represent on the map? Three possibilities can be identified: (a) the *prescribed task* as defined in organizational documents and procedures; (b) the *practised task* as conducted in the current work context, including how the participants interpret and cope with the prescribed task; or (c) *the task that should be performed in an ideal work context* (i.e., if processes were improved) from their point of view. The participants went back and forth between these three possibilities throughout the activity and the maps reflect this ambiguity. At this point of our reflection, we believe that option 'b' would appear to be better suited when the goal is mainly to support the integration of new employees into the university culture, and option 'c' when it is to improve organizational efficiency. Option 'a' would be better suited to a context where the goal is to enhance awareness of the existence of organizational knowledge elicited in institutional documents, tools and resources.

The second issue raised by the participants can be summarized as follows: Where shall we draw the line in the elicitation of 'good' Instructional Design principles? Should we assume that newly hired employees are equipped with the 'basics' in this domain? In both groups, the participants raised this issue at a certain point during the elaboration of their knowledge maps. They finally stated that it was unnecessary to clarify all of the knowledge that newcomers should have acquired prior to being hired. The Prof Group instead suggested that a set of learning resources developed for distance courses offered by the university in the field of Instructional Design should be attached to knowledge entities represented on their map. The map would then serve as a complementary professional development tool to newcomers. It is important to mention that these professors were all affiliated to the Education Faculty. It would be interesting to see if participants from other disciplines would have behaved differently, since we know that, in general, university professors have no training in course design or in pedagogy in general. Many are even unaware of the fact that there is an area called 'Instructional Design' in the field of Educational Technology. These professors might feel the need to discuss their instructional design practices in more detail. Mixing professors from different disciplines, including Education Science, would be an interesting group mentoring modality to explore in future projects. As for the ID Group, we observed that participants included more Instructional Design principles in their map, but they also felt the need to 'draw the line' at a certain point. As a guideline, we suggested that the group focus on work practices that are specific to the academic culture of the university, and to include the Instructional Design principles that they felt especially significant in their practices and useful for future newcomers.

Professional Learning

The participants from both groups and at all levels of expertise commented throughout the experiment that it was beneficial to their professional development. They said they had learnt a lot from this experience and that it had already had some beneficial effects on their work practices. The following are some examples of comments voiced by the novice participants during the final interview and the debriefing sessions conducted in both groups:

> *As far as I'm concerned, I have learnt a lot. […] If I had known everything that I heard today, I would have done things differently. […] I'm already learning!* (Novice, ID Group, Debriefing Meeting 1)

> *Same as every meeting, I am learning a lot! […] As our practices differ and as we discuss them, it makes me self-reflect on my own practices.* (Novice, ID Group, Debriefing Meeting 7)

> *My perceived level of competency has improved since we began working on this project […]* (Novice, ID Group, Meeting 10)

> *It has […] allowed me to learn about the operations in general. It has allowed me to find my place in the culture of the Department and regarding the issues of designing a course at the university and all of the organizational operations.* (Novice, Prof Group, Final interview)

Even the intermediate and expert participants felt they had learned something related to their work practices during this experiment:

> *For me, it's like an important professional development activity, even at the end of my career.* (Expert, Prof Group, Debriefing Meeting 10)

> *I think we learn a lot through such a project. […] Discussions with others can help people increase their level of competency a little more rapidly*. (Expert, Prof Group, Final interview)

> *Something has changed in my practice, since the beginning of this experiment. Thus, it is very encouraging.* (Intermediate, ID Group, Debriefing Meeting 8)

Conclusion and Discussion

The data that have been analyzed so far suggest that combining group mentoring and collaborative knowledge modeling could be a promising strategy to support the integration of new employees into the university culture. It could also contribute to the improvement of work processes prescribed in the higher education institution.

In a review of recent research on workplace learning, Tinjälä (2008) identifies three basic modes of professional learning that can take place at work: (1) incidental and *informal* learning, which "takes place as a side effect of work" (p. 140); (2) intentional but *non-formal* learning, which results from the learning activities such as mentoring, intentional practising of certain skills or tool use; and (3) *formal* on-the-job and off-the-job training. We think that the experimented strategy represents a new type of learning space for professionals, which can be classified in the second category. It is an intentional activity in the sense that it was planned by one member of the academic staff and was supported by the institution. It is non-formal in the sense that the learning content was not predetermined but rather emerged during the interaction between participants, and between them and the knowledge mapping tool. This type of peer- and mindtool-mediated professional learning activity fits well with conceptualisations of learning described metaphorically by Sfard (1998) as the 'participation metaphor' (distinguished from the 'acquisition metaphor'), which emphasizes learning taking place by participating in the practice of a professional community. We also think that the strategy could not only socialise newcomers into existing practices, but contribute to the creation of new practices at the individual and organizational level as well. In that sense, it also emphasizes the third learning metaphor proposed by Paavola, Lipponen & Hakkarainen (2004), which they called the 'knowledge-creation metaphor'.

One may ask how the strategy can be realistically implemented by an entire university, since it is quite time-consuming for the participants as well as for the moderator and the person at the computer. One option may be that the university implements a group mentoring program essentially matching the set-up of the experiment reported in this paper, but without having a moderator designated by the institution to lead the groups. Instead, prior to the onset of their mentoring activities, participants would be trained to use the MOT language and the *G-MOT* software tool as well as to the structure of the generic model of professional actions (Figure 1). Moreover, participants would be provided with a self-questioning guide to help them collaboratively elicit tacit knowledge during the sessions. Each group would designate one participant to act as a moderator and another participant to draw the map at the computer, perhaps different ones at each meeting. All participants could also be invited to review the map individually between the sessions and bring their comments on the map, which would be discussed at the next meeting.

Groups could either create a map from scratch or build on maps created by previous groups, perhaps allowing the number of mentoring meetings to be reduced. Interestingly, this last option would also allow the maps to be continuously updated as professional practices evolved.

We are now in the process of exploring how and which of these different options could be tried out in the university. In every case, resources will need to be allocated to the program, though some options may be more costly in terms of time and effort than others. Research on such strategy implementation options should be carried out as they may also lead to different results in terms of professional learning and expertise transfer. Future research should also be conducted on a larger scale and in different settings to pursue the exploration of the four research questions formulated above.

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