

Five Ws and One H in Knowledge Management Education

Meliha Handzic, John Edwards, Sandra Moffett, Alexeis Garcia-Perez, Aino Kianto, Ettore Bolisani

1. Introduction

The 21st century economy, with the increasing importance of innovations for economic growth and competitive advantage, suggests the need for better knowledge management (KM) of modern workers. Among many expectations facing these new-age knowledge workers, Handzic (2007) identified the following: being skilled at creating, acquiring, and transferring knowledge and modifying their behaviour accordingly; being capable of continually expanding one's capacity to create desired results, nurture new thinking patterns, set free collective aspirations, and learn how to learn together; and inventing new knowledge as a way of behaving or being. In addition, there is also an upsurge of KM-related issues that companies increasingly need to master, regardless of whether they have formal KM programs or not: for example, how to use ICT applications and KM-based approaches to analyse and exploit big data and to build up a competitive intelligence (Liebowitz, 2006); how to set appropriate mechanisms of knowledge exchange and protection (Bolisani et al., 2013); and how to include KM-related approaches in human resource management and capability building (Brewer and Brewer, 2010).

Organisations' increasing demand for new skills and capabilities for modern knowledge workers necessitates a corresponding response from the training and education sector. In general, this demand has not been adequately met. Major criticisms are directed at training content that does not reflect the cross-disciplinary nature of the field of practice, has no base in reality, and does not cultivate creativity and problem-solving skills. According to Srikantaiah (2007), consulting firms' training programmes are centred around three themes: learning organisation, information repositories, and technology, while the academic programs vary widely depending on the school that administers them. In addition, instructional methods largely impart knowledge rather than allow constructing it through experience.

Recognising the existing problem, the current paper aims to address the issue of KM education through a mixed approach that combines a review of literature and an authoritative panel discussion of the essential questions (why, what, who, where, when and how) on the topic. The key objective is to make a step towards building an educational system for KM that can best meet the requirements of the knowledge economy and find the consensus of KM researchers or practitioners. The basic idea is to highlight the essential elements of a possible agenda for educators that can serve as points of discussion and guidelines for educators and institutions that are engaged in building a KM educational program.

The paper is structured as follows. After this brief introductory section (1), a systematic analysis of the available literature on the topic of knowledge management and education is presented in section 2, with the purpose to identify the current state of the art and the existing gaps in the literature. Then, a report from the recent panel on KM education held at the 2016 International Conference on Knowledge Management is presented in section 3, to allow for the most recent peoples perspective on the issue. The paper ends with a concluding section (4) that highlights main current contributions and plausible future directions.

2. Analysis of the literature

With the purpose to assess the impact of the issue of Education on KM, a systematic review of the pertinent literature was first conducted through the following steps:

a) Selection of sources, based on the Serenko and Bontis (2013) list of journals that are relevant to the KM literature. From this list, only journals included in the Scopus database (www.scopus.com) were selected (Table 1), with the purposes to examine journals having a recognized bibliometric impact, and to give consistency to the analysis. The temporal window ranges from 1996 to 2016 – although it was possible to find papers published only from 2005 onward.

- b) Detection of articles that have pertinence with KM and education. This was done by using the Scopus internal search engine. The keywords “education” and “knowledge management” (entire phrase) were searched in the “Abstract, Keyword and Title” field.
- c) Selection of pertinent papers. Since the two keywords/keyphrases may fit different topics, papers were examined to check their real focus. Only articles dealing with “KM in Education” and/or “Education in KM” were considered (see Table 1)
- d) Analysis of annual trend. The yearly number of papers on the topic was counted.
- e) Content analysis and classification, to understand the directions that the research is taking. This was essentially done manually by the authors of this paper, by examining fulltexts of articles and particularly their essential points. The purpose was not to fully analyze the contents of articles, but just to classify the category of the study they propose, the research method adopted, and other points relevant to the topic under investigation (see tables 2 and 3). Being just a background analysis to frame the subsequent discussion, this approach was considered sufficient.

INSERT Table 1. List of examined journals and selected papers

Figure 1 shows the number of total papers yearly published in the selected journals. Clearly, considering that just a restricted sample of papers was used, these figures are significant more as statistical trends than in terms of the absolute figures. Generally speaking, it can be noticed that the literature didn’t show particular interest in the topic until the last decade (the first papers appeared in 2005). The number of articles remained low, especially compared with much more popular topics in KM (e.g. “strategy”, “community of practice”, “knowledge transfer”, etc.). Annual peaks (e.g. in 2009 and 2015) may depend on specific opportunities of publication (for example, special issues), or on timing of editorial procedures, and do not show an evident growing or declining trend. In short, it may be said that, in the last decade, the KM community has started to develop interest in education, but only for a restricted number of specialists. Instead, by simply googling the keyphrases “knowledge management in education” or “education in knowledge management”, one retrieves thousands of websites and resources of various kinds. This may indicate, on the one hand, the importance of the topic in the real life, and on the other hand, the relative delay of the research community in publishing research.

INSERT Figure 1. Annual trend of publications on KM and education

Table 2 summarizes some statistics about the papers and provides classifications based on their content (note that, for some papers, more than one category may be pertinent). A first point relates to the *application context* of KM education. Three options were considered: “higher education”, which refers to KM issues in universities; “professional education”, which refers to the case of training in companies and to applied vocational courses; “primary/secondary education”, referring to younger students (from primary to high schools). It is notable that the large majority of studies (66% of total) refers to the traditional university context, in other words to generic degree or post-graduate education. Therefore, although KM is, in principle, a discipline that is related to the “practice”, studies of KM in professional education are much less numerous (18%), as well as in the case of primary/secondary education (18%).

INSERT Table 2. Classification of paper contents

Perspective refers to the main focus of papers, i.e.: “learner” perspective (e.g.: studies of KM perceptions and problems from the viewpoint of learners, how KM is learned, how learners use KM, etc.), “teacher” perspective (e.g.: KM methods for teachers, or how teachers teach KM, their awareness and view of KM methods, etc.), and “institution” (for instance: how a university is organized in terms of KM, how a company uses KM for training, structure of KM courses in a school, KM supporting processes of an education institution, etc.). Here, figures are more balanced than the previous case, even though most papers adopt a perspective of *learners* and of *institutions*. The examination of the *kind of study* reveals

that “conceptual papers” and “literature reviews” are less represented than those that describe “design and application” of systems or methods and, especially, empirical analyses (which represent a good 77%). In substance, the research is highly oriented to practical or real-life issues that use existing theories or models, rather than the formalization of concepts or theories that may help to understand the relationship between KM and education.

Finally, while a pretty balanced situation regards the *approach of studies* (“qualitative” – e.g. case studies, interviews, speculations: 57%; “quantitative” – e.g. statistical surveys or formal models: 48%); it must be noticed here that some articles adopt a combined approach. What is remarkable is that the *orientation* of research has a substantial bias towards “KM in education” (75% of papers) rather than “education in KM” (25%). This is a key point to consider: substantially, KM is rarely seen as a specific discipline or subject of study that attracts special interest in universities or companies. Instead, KM methods and processes are analyzed as possible components of the teaching/learning approach to other disciplines.

While it should be acknowledged that a substantial bias towards “KM in Education” was found, it is also important to analyze the articles that treat “education in KM”, which is the main focus of this paper. Table 3 reports the results of the same analysis described before, but focusing only on these papers. Here, it is interesting to notice that, although with differences, all *contexts* are considered by articles (i.e. universities, businesses, and primary/high schools), which means that KM as a discipline or topic can be, indeed, suitable for any environment. Similarly, papers consider the *perspective* of learners, teachers and Institutions, but the two former perspectives (of learners and teachers) are more considered in total. Although it is different to draw clear conclusions, given the figures shown here, it may be said that the reflection on important issues like how KM courses should be included in the formal educational syllabus of universities or in the training programs of companies is still insufficient, and may represent a gap that needs to be filled. Studies are substantially *empirical*, so there is apparently little reflection on important issues such as cognitive models to teach KM. The research approach is mostly quantitative or formal (e.g. surveys or formal models).

INSERT Table 3. Classification of paper contents restricted to papers on KM in Education

To sum up, the results of this analysis reveal the state of the art of knowledge and research in “KM and education” and, most importantly, reveal a significant gap in the literature as regards education FOR knowledge management. The panel discussion organized by the authors with the intention to reduce this gap is reported in the next section.

3. Report from a KM Education Panel

This section is organized around basic questions and answers about KM education as discussed in a panel at the 2016 International Conference on Knowledge Management (Handzic et al., 2016). First, panelists’ personal positions on five “W” questions (why, what, who, where and when) are presented. After that, an open discussion with around 30 participants followed. Participants were of various categories: KM researchers, educators, and practitioners. This discussion made it possible to delineate the main open points in the current debate, and to make a summary of a “common vision” of the ultimate “H” (how) to approach KM education in the future. The development of a common vision resulted from further exploration of the panelists’ ideas with the audience. Detailed descriptions of the topics covered are provided below.

3.1 Why

Knowledge management (KM) is vital to the effectiveness of organizations - and indeed of cities and economies (Powell and Ambrosini, 2012). Arguably, knowledge work is even more crucial to effectiveness and competitiveness now than in the past, as Drucker (1969) was perhaps the first to recognize some years ago. The connectedness of economies and businesses means that knowledge and

learning are essential for organizations to remain competitive - or even just to survive. The processes around that knowledge need to be managed, not just left to happen.

Over the past 20 years or so, a great deal about how to do KM has been learnt, and also how difficult it can be (Bolisani and Handzic, 2015). KM is rarely a “quick fix”; it does not have an instant impact - it’s more of a “long game”. Major barriers thus include the lack of time to spare from daily operations. This increases the temptation and pressure to “get on with the day job” and leave longer-term initiatives like KM for another day. Another barrier is the lack of knowledge champions to make sure that KM initiatives are implemented locally. Therefore, it is not enough to sit back and hope that managers and other staff will decide to learn about KM for themselves; there is the need to educate them. Thus, the starting assumption is that everyone in an organization needs to know something about KM; this is both an operational and a cultural issue.

Operationally, the external environment in which organizations operate is globally connected and increasingly complex. Organizations and their employees are deluged in data (with ever-increasing volume, velocity and variety) from both internal and external sources. The retirement of the “baby boomer” generation in many Western countries also means more work to retain the knowledge that staff have in their heads. Although many KM successes have been reported (e.g. Liebowitz, 2016), KM needs to deliver continuous benefits, not just isolated projects (Zyngier and Burstein, 2012).

Organizations where there is a culture of employees respecting and sharing knowledge perform better (Argote, 2005). Awareness of the benefits of a knowledge-friendly culture, or the problems of its absence, goes all the way back to Davenport et al. (1998) and Ruggles (1998). From Nonaka’s school of KM thought, the whole principle of *ba* includes a supportive cultural dimension: Albinsson et al. (2008) give one example of this. Yang (2007) found that collaboration culture strongly helps knowledge sharing. Lam (2005) gives a good example of how cultural issues derailed a KM initiative. However, creating such a knowledge sharing culture remains a challenge for both research and practice, as does measuring the effectiveness of KM initiatives.

3.2 What

KM is complex. As a multidisciplinary field, content is drawn from subject areas such as Computer Science, Management, Organisational Behaviour, Accountancy, Human Resources, Sociology, Psychology and so on. While each perspective contributes to the richness of the field, and multidimensional perspectives assist in ‘grounding’ the subject, the challenge arises in what to teach as part of knowledge management curricula. For this reason, KM can be taught in two ways: firstly as a subject in its own right, or secondly, as a component of a wider topic. Either way brings challenges on what content to include to ensure students develop the skills required to future proof the knowledge economy.

As a discrete discipline, KM is a theoretical subject. To fully understand the challenges associated with knowledge application, it is necessary to understand the philosophical views of knowledge creation and generation, and the implications of adopting a positivist or socialist paradigm (Kuhn, 2012). In addition to epistemology (the theory of knowledge, especially with regard to its methods, validity, and scope, and the distinction between justified belief and opinion) there are many definitions, models and behaviors of KM to learn. In substance, to fully comprehend the role of knowledge, it is vital that KM students understand the philosophical stances that surround the topic (Guns and Välikangas <http://www.emeraldinsight.com/author/V%C3%A4likangas%2C+Liisa>, 1997). So, essential questions are: should this be the content of a KM course? Is this what is relevant in the knowledge economy and of most value to graduates, from whichever discipline they emerge?

But in addition to theory, KM has a practical element. Organizations are calling for graduates to be ready to ‘hit the ground’ running and are seeking a broad skillset to include technical competence, business analysis, social media marketing, accountancy and economic awareness, to name but a few. Once again, this calls into question what to teach as part of the KM agenda. Is it reasonable to expect a graduate to have such skills obtained through a KM course or should these skills be obtained in a more specific and

defined way, such as in a Computer Science or Business course only? If KM is taught as an optional or bolt-on module how detailed should the practical element be? Are graduates benefitting or limiting their skills by chosen KM modules over others?

What to teach and what to learn are, consequently, questions that need to be addressed in a student-centered, research-led curricula. This also questions the best approaches to adopt for KM education, also recalling the theory-versus-application debate. With various subject areas and different schools of thought, highlighting the importance of their own content to KM everyone is 'vying for a slice of the curricula pie' but with so much KM-orientated content what is the optimum program of study?

In addition to content, the question arises on what to assess. Are KM skills best assessed through theoretical approaches (such as literature reviews, research papers and conference contributions), practical application (such as the development of software prototype systems), role play (where the student applies their knowledge to a real-life industrial/commercial situation) or examination (rote learning)? Currently in KM education there is little consensus on what a competent KM student should be able to do. This being the case how can organizations have confidence in KM education – if we are unsure what to teach, what to assess and what to expect from a graduate, how can organizations have confidence in the skillset that they are employing and how do they use that initial skillset for organization growth and development?

3.3 Who

Knowledge Management is a global discipline concerned with the creation, sharing and reuse of knowledge resources. Key KM enablers include organizational culture, business strategy, leadership and the use of information and communication technologies and systems. This puts "People" at the centre of any KM strategy. KM education is therefore expected to provide people, within and outside organizations, with a range of skills and a global perspective of the implementation of KM strategies and tools in a variety of contexts defined by multiple organizational and national cultures.

However, despite the range of skills and experiences it encompasses, KM education is often seen as an in-classroom strategy, limiting its scope to undergraduate and postgraduate students mostly from Management disciplines. This approach does not always allow for the preparation of professionals from many disciplines for the human interactions (collaborating, learning, innovating, sharing) with others, often beyond their own organizations and communities, required to embrace the principles and tools that define a KM strategy. KM education therefore requires an understanding of the variety of actors potentially involved in the implementation of KM strategies so that their specific needs are addressed in an effective manner and in the right context.

On the basis that KM initiatives -of which the classroom and Wikipedia are but two examples - can be found throughout and beyond the business environment, significant points in the current debate are the variety of potential KM actors, their roles within KM initiatives as well as the nature of their information and knowledge needs, all of which is expected to inform innovative KM education strategies. The concept of a KM actor in this context, will be understood as an individual, group or community (e.g. a community of practice) directly or indirectly involved in an effective process of creation, sharing and reuse of knowledge in a particular situation. As this concept is not restricted to the context of organizations, the debate is expected to cover local, national and global KM initiatives, as well as KM strategies that rely on both the digital and physical environments.

Based on the actor-role-education relationship, the current debate needs to raise awareness of the necessity to widen the scope of KM education and to use innovative approaches to address a range of increasingly important KM skills in the workplace and in society.

3.4 Where

The role of knowledge as a primary performance driver has been observed all across the world, and accordingly KM is seen as a topical issue worldwide (e.g. Heisig, 2015; Heisig et al., 2016). To examine

where specifically education in KM is taking place, data on university-level KM degree programs was collected in October 2016 through: a) purposive sampling survey to 146 members of the global KM researcher community, known to one of the paper authors through professional networks; b) internet search e.g. with the keywords “knowledge management” and “program/master/bachelor/doctor” in English, Spanish, French, Swedish and Finnish languages. It was found that KM indeed is currently being taught as an academic discipline all across the world. University programs with KM focus were found in all six continents, most of them in Europe, followed by Asia and North America. Top five countries with the largest number of universities with KM degree programs were US, UK, Spain, Germany and Malaysia. Therefore KM education is a global phenomenon, and seems to be on the increase, as many of the identified programs were newly established. However, it should be noted that not all of the programs were actually called “KM” degrees, but still had such a substantial KM content and focus, that the experts nominated them as KM programs. To some extent the labeling of an academic program can be taught of as a political decision, related e.g. with the intra-university power relations, or as a marketing issue, as demonstrated by some programs changing their label from innovation management to KM or from KM to entrepreneurship without a substantial change in the actual curriculum content. Degree programs were found in both applied as well as “academic” universities. In addition, most programs were on Master level, and many universities that had KM on their offer, were likely to have it on multiple levels (Master and Bachelor or Doctoral, or all three). All of these findings demonstrate the global quality of KM education.

It is well-known that KM is a multi-disciplinary field, which is rooted in and draws upon a number of other, more established academic disciplines (e.g. Alavi and Leidner, 2001; Argote, 2005). These range from cognitive science and psychology to information and library science, from philosophy to information technology, and management accounting to sociology, to name a few. This means that the academic positioning of KM education cannot be taken for granted. The information acquired from the expert survey and internet search indicates that the most typical institutional locations of KM programs were schools of business, computer science and information science. This reflects the key aspects of KM as a discipline related with both management of people and networks as well as information technology (Bhatt, 2001; Argote, 2005; Andreeva and Kianto, 2012).

Finally, advancements in information technology offer increasing possibilities for distance education and e-learning (e.g. Moore and Kearsley, 2012). As an IT-related discipline, KM may be an especially logical topic to take advantage of these emerging possibilities. Indeed it seems that most academic KM programs would be utilizing mixed-mode teaching, combining face-to-face and online teaching methods. However relatively few programs are completely on-line, demonstrating that at least in university level, there is a need for real-time social interaction in terms of KM education.

3.5 When

KM competencies can be important at any time of a person’s educational or professional career. However, goals and modalities change depending on the specific time in a person’s life, and on the directions of individual development (Figure 2.)

As mentioned, there is scarcity of literature that explicitly treats KM as a possible subject in primary or secondary schools. One of the few examples is Hershkovich and Haberman (2012), who report the experience of Israel where a special curriculum has been introduced in high schools to make students learn the essence of knowledge and KM through the use of ICT tools. More frequently, the literature reports about the teaching of techniques that are broadly related to the management of knowledge (for example, knowledge or conceptual maps – O’Donnel et al, 2002; Awofala, 2011) but are generally not considered a basic elements of the “core” KM discipline. In any case, these experiments show that teaching KM at primary or secondary schools implies educating in “Personal KM” (Pauleen, 2009, Wright, 2005): in other words, rather than concepts and methods for the “big” KM programs or technologies to be applied in business, personal knowledge management refers to methods that the single

individuals can use for managing their own knowledge base. Learning how to manage personal knowledge can also provide a method of study and a help to young students in their career (Gut, 2011).

INSERT Figure 2. Directions in KM teaching in a person's career, and related challenges

Teaching KM methods at school is a challenge for classic systems. These are based on single subjects, generally treated separately from one another by specialized teachers, and involving distinct cognitive capabilities (Beane, 1992), while KM is, by definition, a transversal competence aimed to boost learning of any kind of discipline. In addition, traditional schools are still lecture-based systems, where a teacher decides what all learners should know, which clearly contrasts with a personalized approach. Managing personal knowledge is not just a matter of handling pieces of knowledge like they are “explicit objects” (Bolisani and Ultramari, 2012; Bolisani et al., 2012), and requires new learning processes. Today, the school system is reflecting on a reform of teaching methods (Stuyven et al, 2010), and here KM would be of use to help the single individuals to develop their own personal cognition (Smedley, 2009).

In higher education (i.e. Universities), the place of KM changes. It is sometimes introduced as a specific subject, and the goal is developing professional competences for people that, in companies and public organizations, lead KM-related programs and projects – i.e. help others to manage their knowledge. A major challenge is that KM is not yet an established and “publicly recognized” discipline, and despite recent surveys show there is an increasing number of KM courses and efforts to define a KM academic curriculum, an established reference is still lacking (Grossman, 2007; Cervone, 2016). Quite often, the term itself KM is included in the curricula of other fields, for example computer science (Grossman, 2007) or Information and Library Management (Roknuzzaman and Umamoto, 2010), where KM becomes just an ingredient, which may lead to a narrow view of its potential. Furthermore, the professional career of “knowledge manager” has not always a clear recognition in companies (Bolisani and Scarso, 2011), and a KM profession still requires the integrated combination of different competencies (from psychology to computer science, from business management to social processes) that a person generally develops separately from one another. In short, we may say that teaching KM as a specific subject in Universities raises an issue of *standardization* of the discipline, with a precise identification of courses, careers, professional targets, and learning goals.

Later in a person's career, learning KM can change in relation to the possible job position. Those whose profession will directly relate to KM (i.e. knowledge managers, chief knowledge officers, facilitators of communities of practice, etc.) require good and sound competence in the conceptual and practical aspects of KM. They run KM programs and so they need to be aware of KM abstract principles and standard techniques. On the one hand, KM people must be able to face the specific KM problems of the single company, and in addition they are often assigned additional tasks (for example, project management, IT functions, quality management, etc.). This implies a multidisciplinary competence (Chen et al. 2002) and a capability to place KM in the right place into the specific business context of application. In short, the KM people must have awareness of the broad *KM toolbox* and the way it can be really applied in business.

People that have other positions in companies may still need some fundamental knowledge of KM, either because they need to decide or audit KM investments, or because they are users of KM programs or systems (for example, as members of a Community of Practice). Studies of the so-called KM maturity models (Pee and Kankhahalli, 2009) show that companies willing to use KM effectively need a high level of awareness by its employees, at least as regards its basic principles, and specifically targeted to the specific *business case*.

Finally, for those that aim at a research or academic career, doctoral courses become essential. Promoting more doctoral research in KM is a way to provide more formalized education and to ensure a long term development to KM as a *scientific discipline*. Grossman (2007) shows that an increasing number of universities started to propose PhD courses specifically labeled as KM, and there are even more doctoral theses that refer to KM even though the PhD course refers to another discipline. This is, indeed, another

sign that KM does have a place in scientific research but not necessarily as a separate and established discipline.

3.6 How

This section summarizes the results of the discussion that was led after the panelists' presentations and Q&A session at ICKM 2016. The audience was divided into two groups, each one focusing on a different aspect of KM education. The first group discussed the problem of how to teach or learn KM in universities and school, while the second group focused on KM education in the industry. The results of their analysis were synthesized on two boards by the two teams. Table 4 shows a summary of some points raised by the two groups:

INSERT Table 4. Summary of points raised by two groups of participants

The above literature analysis and panel discussions reinforce the broad guidelines suggested by Handzic (2007) to aid the development of an effective education system for KM:

(i) Roles and jobs: While the responsibility for knowledge can be shared among all employees within an organisation, it is advisable to establish a supportive organisational structure for KM involving a set of special KM roles and positions (e.g. knowledge manager, knowledge engineer, knowledge scientist). These individuals may assist in smoothing knowledge flows and enhancing the quality of knowledge objects. The justification for and the aim of KM education and/or training should be to ensure that these people gain skills and competencies needed to play these roles.

(ii) Curriculum development: Special programs in KM (e.g. at Master's level) are recommended that should be designed to provide multidisciplinary perspectives on knowledge management as an emergent organisational phenomenon; provide an orientation to working and managing in contexts where knowledge is a central capability and a driver of organisational success; and provide choice in adapting study programs to academic or work backgrounds and career aspirations or needs.

(iii) Innovative teaching and learning: The right balance needs to be found between the imparting of knowledge to the learner and the learner's own construction of it. Blending of traditional face-to-face and on-line modes of learning is encouraged to promote and facilitate student-centred learning. Interactive teaching and learning is advocated to assist in building a community of practice, as well as the development of effective cross-cultural learning to help better manage cultural diversity in contemporary workplaces.

4. Conclusion

This paper recognizes that KM is a relatively new phenomenon and that there is no clear consensus about roles that KM employees should play in an organization, what competencies and skills they need to have to play these roles, and where and when they should obtain them. More importantly, the paper tackles some of these questions through a combination of a systematic literature review and the analysis of the results of panel discussions on the topic of KM and education with KM researchers, educators and practitioners, that was held at a major international KM conference. Overall, the paper contributes the analysis of the state of the art of knowledge and research on the topic, and a common vision of a group of KM researchers and educators. Table 4, in particular, provides an outline of essential points that can be of use for people involved in the organization of KM educational programs at universities or for professionals. Based on this, broad guidelines on how to approach KM education in the future may serve as a solid basis for further research.

Implications for research. The analysis shows that, while the issue of KM in Education is somewhat represented in the literature, the problem of Education in KM is less treated. This is a gap that needs to be filled, especially considering the growing importance of KM in all steps of people's career. In addition, it is a necessary point for establishing KM as a scientific discipline. The suggestion of this paper is also that an analysis of the different dimensions of the problem (i.e. the why, what, who, where, when and how dimensions) can provide interesting viewpoints and can also facilitate the development of studies on the general goals and abstract models of KM education but also of specific analysis of the results of the current practice. Another important message for research is that any attempt to better framing KM in the broader context of scientific areas may serve to make it recognizable to potential students, professionals, and Institutions.

Implication for practice. The last point analyzed in the paper (the "how" dimension) also provides interesting suggestions for those (and, particularly, educators working in teaching institutions and professionals specializing in business training) that may be interested in developing educational programs in KM. First, it is shown how KM is, somewhat, transversal and complementary compared to a person's set of competences, but needs to be integrated into them. In addition, it requests conceptual and abstract models, but must be directly related to the practice and real-life situations. Also, KM courses and curricula have to fit the specific needs of people in their distinct steps of career or job positions. A critical question is why students should decide to study KM at University; here there is apparently still a gap between theory and practice. Furthermore, teaching KM requires innovative teaching and learning: a right balance is needed between the imparting of knowledge to the learner and the learner's own construction of it.

Limitations. The literature review proposed in the first part of the paper is limited in scope and extension, as the goal was just to provide some background elements for the discussion developed in the paper. Indeed, rather than being a complete piece of research, the article aims to collect and elaborate ideas and suggestions that can both be obtained from the literature, and also can come from experts and KM professionals. In other words, the main goal is to provide food for thought and interesting suggestions that need developing but, at the same time, can provide inspiration for further research and practical applications in a promising but still underdeveloped field.

References

Albinsson, L., Curtin, G., Forsgren, O., and Wall, M. (2008), "Creating and sustaining successful knowledge management in purposeful communities-summary of key experiences from pioneers", *Systems Research and Behavioral Science*, Vol. 25 N° 5, pp. 615-626.

Alavi, M. and Leidner, D. (2001), "Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues", *MIS Quarterly*, Vol. 25 N° 1, pp. 107-136.

Andreeva, T. and Kianto, A. (2012), "Does knowledge management really matter? Linking knowledge management practices, competitiveness and economic performance", *Journal of Knowledge Management*, Vol. 16 N° 4, pp. 617-636.

Argote, L. (2005), "Reflections on two views of managing learning and knowledge in organizations", *Journal of Management Inquiry*, Vol. 14, pp. 43-48.

Awofala, A.O.A. (2011) "Effect of concept mapping strategy on students' achievement in Junior Secondary School Mathematics", *International Journal of Mathematics Trends and Technology*, Vol. 2, N° 3, pp. 11-16.

- Beane, J. A. (1992), "Turning the floor over: Reflections on a middle school curriculum", *Middle School Journal*, Vol. 23, N° 3, pp. 34-40.
- Bhatt, G. (2001), "Knowledge management in organizations: examining the interaction between technologies, techniques, and people", *Journal of Knowledge Management*, Vol. 5, N° 1, pp. 68-75.
- Brewer, P.D., and Brewer, K.L. (2010), "Knowledge management, human resource management, and higher education: a theoretical model", *Journal of Education for Business*, Vol. 85, N° 6, pp. 330-335.
- Bolisani E. and Scarso E. (2011), "Managing professions for knowledge management", *International Journal of Knowledge Management*, Vol. 7, N° 3, pp. 61-75
- Bolisani, E., Paiola, M. and Scarso, E. (2013), "Knowledge protection in knowledge-intensive business services", *Journal of Intellectual Capital*, Vol. 14 N° 2, pp. 192-211.
- Bolisani, E. and Handzic, M. (Eds.) (2015), *Advances in knowledge management: Celebrating twenty years of research and practice*. Springer International Publishing, Berlin.
- Bolisani, E. and Oltramari, A. (2012), "Knowledge as a measurable object in business contexts: a stock-and-flow approach", *Knowledge Management Research & Practice*, Vol. 10, N° 3, pp. 275-286.
- Bolisani, E., Borgo, S., and Oltramari, A. (2012), "Using knowledge as an object: challenges and implications", *Knowledge Management Research & Practice*, Vol. 10, N° 3, pp. 202-205.
- Chen, H.H., Chiu, T.H., and Fan, J.W. (2002). "Educating knowledge management professionals in the era of knowledge economy", *Journal of Information & Knowledge Management*, Vol. 1 N° 2, pp. 91-98.
- Cervone, F. (2016) "What Might the Curriculum in Knowledge Management Programs Tell us About the Future of the Field?", *proceedings of the 17th European Conference on Knowledge Management*, Belfast (UK), 1-2 September
- Dalkir, K. (2011), *Knowledge management in theory and practice*, MIT press, Boston.
- Davenport, T., DeLong, D., and Beers, M. (1998), "Successful knowledge management projects", *Sloan Management Review*, Vol. 39, N° 2, pp. 43-57.
- Drucker, P. F. (1969), *The age of discontinuity*, Heinemann, London.
- Grossman, M. (2007), "The emerging academic discipline of knowledge management", *Journal of information systems education*, Vol. 18, N° 1, p. 31.
- Guns, W.D. and Välikangas, L. (1997), "Rethinking Knowledge Work: Creating Value through Idiosyncratic Knowledge", *Journal of Knowledge Management*, Vol. 1 N° 4, pp. 287 - 293
- Gut, D.M. (2011), "Integrating 21st century skills into the curriculum", In Wan G., Gut D.M. (Eds.), *Bringing schools into the 21st Century*, pp. 137-157, Springer, Berlin.
- Handzic, M. (2007), *Socio-Technical Knowledge Management: Studies and Initiatives*, IGI Publishing, Hershey (PA)
- Handzic, M., Edwards, J., Moffett, S., Garcia-Perez, A., Kianto, A. and Bolisani, E. (2016)," Knowledge Management Education: Five Ws and One H", *Procedia Computer Science*, Special issue N° 99, pp. 213-214

Heisig, P. (2015), "Future research in knowledge management: results from the global knowledge research network study", In Bolisani E. and Handzic M., *Advances in Knowledge Management*, Springer International Publishing, Berlin, pp. 151-182.

Heisig, P., Olunifesi Adekunle, S. Kianto, A., Kemboi, C., Perez-Arrau, G. and Easa, N. (2016), "Knowledge management and business performance: Global experts' views on future research needs", *Journal of Knowledge Management*, Vol. 20, N° 6, pp. 1169 – 1198.

Hershkovich, E., and Haberman, B. (2012). "A Systematic Knowledge Pattern (SKP) for teaching Knowledge Management", *IEEE 2012 Frontiers in Education Conference Proceedings*, Seattle, 3-6 October, pp. 1-6.

Kuhn, T.S. (2012). "The Structure of Scientific Revolutions. 50th anniversary" (4th ed.). University of Chicago Press. p. 264.

Lam, W. (2005). "Successful knowledge management requires a knowledge culture: A case study". *Knowledge Management Research & Practice*, Vol. 3, N° 4, pp. 206-217.

Liebowitz, J. (2006). *Strategic intelligence: business intelligence, competitive intelligence, and knowledge management*. CRC Press, Boca Raton (FL).

Moore, M. and Kearsley, G. (2012) *Distance education: A systems view of online learning*. Wadsworth Cengage Learning, Boston.

Pauleen, D. (2009), "Personal knowledge management: putting the 'person' back into the knowledge equation", *Online Information Review*, Vol. 33 N° 2, pp. 221–224.

Pee, L. G., and Kankanhalli, A. (2009) "A model of organisational knowledge management maturity based on people, process, and technology", *Journal of Information & Knowledge Management*, Vol. 8, N° 2, pp. 79-99.

Powell, T. H. and Ambrosini, V. (2012), "A pluralistic approach to knowledge management practices: Evidence from consultancy companies", *Long Range Planning*, Vol. 45, N° 2-3, pp. 209-226.

Roknuzzaman, M. and Umemoto, K. (2010), "KM education at LIS schools: an analysis of KM master's programs". *Journal of Education for Library and Information Science*, pp. 267-280.

Ruggles, R. (1998). "The state of the notion: Knowledge management in practice", *California Management Review*, Vol. 40, N° 3, pp. 80-89.

Serenko A., & Bontis N., 2013, "Global ranking of knowledge management and intellectual capital academic journals: 2013 update", *Journal of Knowledge Management*, Vol. 17, N° 2, 307-326

Smedley, J. (2009), "Modelling personal knowledge management", *OR Insight*, Vol. 22, N° 4, pp. 221–233.

Srikantaiah, T.K. (2007), "Training and Education in Knowledge Management", in Koenig M.E.D (Ed), *Knowledge Management Lessons Learned: What Works and what Doesn't*, Information Today, Medford (NJ), pp. 497-510.

Struyven, K., Dochy, F., and Janssens, S. (2010). "Teach as you preach: the effects of student-centred versus lecture-based teaching on student teachers' approaches to teaching", *European Journal of Teacher Education*, Vol. 33, N° 1, pp. 43-64.

Wright, K. (2005), "Personal knowledge management: supporting individual knowledge worker performance", *Knowledge Management Research and Practice*, Vol. 3 N° 3, pp. 156-165

Yang, J.-T. (2007). "Knowledge sharing: Investigating appropriate leadership roles and collaborative culture", *Tourism Management*, Vol. 28, N° 2, pp. 530-543

Zyngier, S, and Burstein F. (2012), "Knowledge management governance: The road to continuous benefits realization", *Journal of Information Technology*, Vol. 27, N° 2, pp. 140-155.

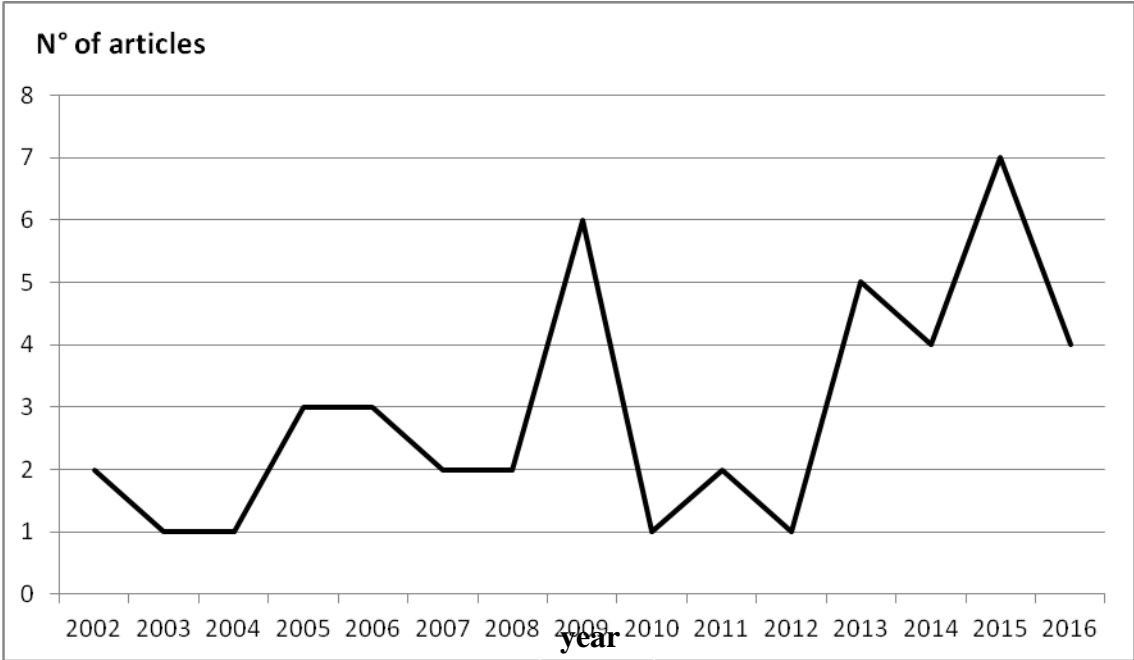


Figure 1. Annual trend of publications on KM and education

Figure 2. Directions in KM teaching in a person's career, and related challenges

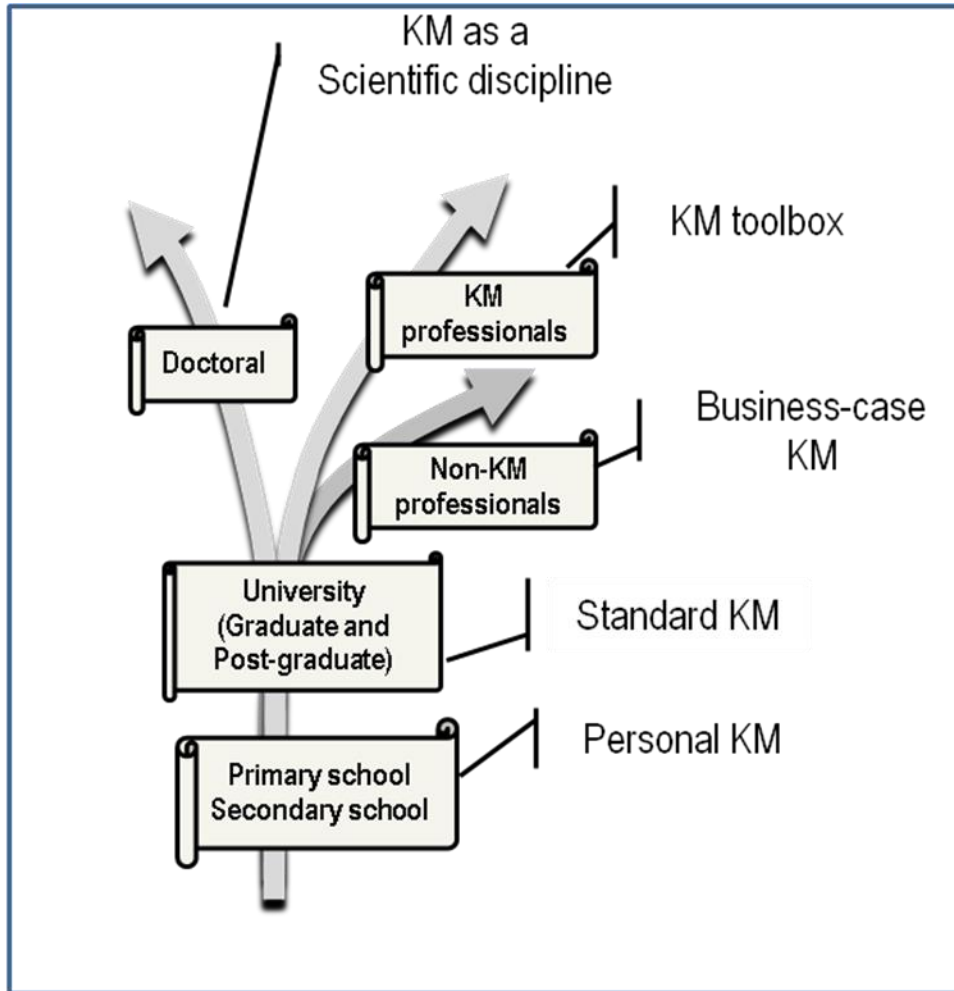


Table 1. List of examined journals and selected papers

JOURNAL	ACRONYM	N° of retrieved papers	N° of considered papers
International Journal of Knowledge and Learning	IJKL	11	6
International Journal of Knowledge Management	IJKM	11	5
International Journal of Learning and Intellectual Capital	IJLIC	3	1
Journal of Intellectual Capital	JIC	3	2
International Journal of Knowledge Management Studies	IJKMS	1	1
Journal of Knowledge Management	JKM	20	5
Knowledge and Process Management	KPM	0	0
Knowledge Management Research and Practice	KMRP	7	3
The Learning Organization	LO	10	2
Journal of Information and Knowledge Management	JKM	15	11
Journal of Information and Knowledge Management Systems - VINE	VINE	15	8
TOTAL		96	44

Table 2. Classification of article contents (44 total articles)

Application context	Higher education: 29 articles (66%)	Professional education: 8 articles (18%)	Primary/secondary education: 8 articles (18%)	
Perspective	Learner: 17 articles (39%)	Teacher: 10 articles (23%)	Institution: 19 articles (43%)	
Kind of study	Conceptual: 7 articles (16%)	Literature review: 1 article (0,5%)	Design/application: 6 articles (14%)	Empirical: 34 articles (77%)
Approach of study	Qualitative: 25 articles (57%)	Quantitative/formal: 21 articles (48%)		
Orientation	KM in education: 33 articles (75%)	Education in KM: 11 articles (25%)		

Table 3. Classification of paper contents restricted to papers on KM in Education (11 total articles)

Application context	Higher education: 4 articles	Professional education: 2 articles	Primary education: 5 articles	
Perspective	Learner: 4 articles	Teacher: 4 articles	Institution: 3 articles	
Kind of study	Conceptual: 1 article	Literature review: 0	Design/application: 0	Empirical: 11 articles
Approach of study	Qualitative: 3 articles	Quantitative/formal: 8 articles		

Table 4. Summary of points raised by two groups of participants

<p style="text-align: center;">Group 1 KM education in universities/schools</p>	<p style="text-align: center;">Group2 KM education in industry</p>
<p>Should the focus of education be on “Knowledge” or on “knowing”? This conceptual and practical distinction is critical, and there is still lack of common understanding of a notion of knowledge. A clear distinction should also be made between “soft” and “hard” KM, but maybe, the former can become more important today</p>	<p>The discussion highlighted the necessity of “special” learning/teaching methods to be used in business, i.e.: Q&A sessions in the daily operation; coffee-machine conversations; groups discussing a remote presentation; practical learning nuggets; bite-sized learning nuggets; bite-sized understanding of concepts</p>
<p>A critical question is why students should decide to study KM at University. It is a matter of not just learning specific KM methods and tools, but to “form the context” where KM can be applied. There is still a gap between theory and practice</p>	<p>Another important point was the necessity to learn how to facilitate knowledge sharing in the business context. Participants underlined the importance of devoting time for engaging in discussions (which may favor knowledge sharing) and also for absorbing the new knowledge. Facilitating knowledge seeking was another topic addressed: participants highlighted the need to teach “how to search” (for both explicit and tacit knowledge content) or how “to look for knowledge from authors” in the business context. The need to avoid knowledge loss and the necessity to train the workforce for that was also mentioned</p>
<p>It may be difficult to label a degree/course as “Knowledge Management”. There may be insufficient recognition/understanding by students, but also reservations about its practical use. The names of job titles/positions in KM are also a challenge (“shall we really use our degree to get a job as knowledge managers?”)</p>	<p>The difficulties of transferring knowledge among people were also debated, and many questions were raised: how can we really transfer knowledge from a specific person to another specific person? How do we acquire knowledge from others? Can we be “objective” in knowledge transfer (i.e. in seeing and acquiring new knowledge) or can personal perceptions change this process? Can we really “document” (i.e. codify and make explicit) our knowledge so that it can be transferred to others, or should we have external support in this process? And how?</p>
<p>KM is not simply managing “elements of knowledge” but it implies a reflection on KM processes and on the centrality of people.</p>	<p>Finally, the problem of “group size of learners” was mentioned, and the possible role of universities to support companies in that.</p>
<p>KM is a peculiar subject that may require new teaching/learning approaches, and also different approaches for different KM issues</p>	