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INNOVATIVE PRACTICE PAPER

Teaching knowledge management by combining wikis and screen capture videos

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Abstract

Purpose – This paper aims to report on the design and creation of a knowledge management course aimed at facilitating student creation and use of social interactive learning tools for enhanced learning.

Design/methodology/approach – The era of social media and web 2.0 has enabled a bottom-up collaborative approach and new ways to publish work on the web, promoted by tools such as YouTube video service. In this spirit a knowledge management course was designed aiming to facilitate university students to compose videos on different difficult concepts in the theory part of the course by searching for explanations on the web and by creating a Windows Media Player video focusing on the self-defined problems. The videos created by the students were published on a wiki (Wetpaint) and the students were encouraged to actively share knowledge and learn from one another by familiarising themselves with the videos of the other students. In order to utilise cognitive and social constructivism, as well as problem-based learning, the principles of the Jigsaw method were used to enable different students to create videos on different themes.

Findings – Based on the authors' experiences it is suggested that curriculum and syllabus planning should be transformed toward a more student-centred approach. This is the most natural in the context of knowledge management, which emphasizes the meaning of participation and knowledge sharing. The social constructivist learning theory emphasizes the meaning of interaction in successful learning. By publishing videos created by the students themselves, by commenting on videos created by other students and by reading comments expressed by others the approach proved to be beneficial for learning in many ways.

Research limitations/implications – The research limitation lies in the differences of quality, format and sizes of these videos produced and the efforts and time requirements for editing and use.

Practical implications – The present finding and report implies more of these resources could be generated by students in other courses in other study areas encouraging use of these types of resources, engaging students with the curriculum, and encouraging interaction amongst students promoting deeper understanding, more positive learning experiences and the generation of curriculum teaching materials by students for class work, making learning more student focused.

Originality/value – The paper focuses on a unique process that allows the use of social technology by students for the generation of materials for use in learning.

Keywords Knowledge management, Wikis, Social media, Constructivism, Screen capture, Video, Learning methods, Students

Paper type General review



1. Introduction

Knowledge management (KM) has been considered as the process of turning data (collection of facts, measurements or statistics) into information (timely and accurate processed data) and, further on, to knowledge (relevant and actionable information in context) (Kanter, 1999; Spiegler, 2000). Others consider KM to be the process for acquiring, organising and communicating both tacit and explicit knowledge of employees in an organisation in favour for other employees to make use of it (Alavi and Leidner, 2001). This knowledge sharing aims to develop more effective and productive students and employees.

It is widely recognised that there is a need to integrate both explicit and tacit knowledge into a formal information system, a knowledge management system (KMS) comprising the creation or acquisition (generation of new insights, ideas, or routines), encapsulation, refinement, storage, management and dissemination of knowledge (Turban *et al.*, 2008; Georgiadou and Siakas, 2011).

KM programmes in organisations usually emphasise the holistic nature of creating, sharing and managing knowledge. Tacit knowledge includes the cumulative storage of the corporate experiences, mental maps, insights, acumen, expertise, know-how, trade secrets, skill sets, organisational learning and organisational culture. Explicit knowledge (or leaky knowledge) deals with objective, rational, and technical knowledge such as data, policies, procedures, software, documents, products, strategies, goals, mission, and core competencies.

Organisations formally capture, manage and store explicitly knowledge with the help of computer-based systems, such as management information systems (MIS), decision support systems (DSS) and expert systems (ES), which today are becoming ubiquitous in organisations (Davenport and Prusak, 1998). However technology by itself often does not solve an organisation's inherent problems relating to intellectual capital, knowledge and information management. Davis *et al.* (2005) argue that KM is based to only 30 per cent on implemented systems and the rest on people. The fact is that the view of knowledge is changing and today it is seen as human capital that "walks out the door at the end of the day" (Spiegler, 2000; Siakas and Georgiadou, 2008). ICTs seem to enhance the KM capabilities of organisations (Alavi and Leidner, 2001; Tanriverdi, 2005).

2. Constructivism

Jonassen (1994) refers to "the implications of constructivism for instructional design" by showing how knowledge construction can be facilitated. He proposes the following principles for knowledge creation:

- providing multiple representations of reality;
- representing the natural complexity of the real world;
- focusing on knowledge construction, not reproduction;
- presenting authentic tasks (contextualizing rather than abstracting instruction);
- providing real-world, case-based learning environments, rather than pre determined instructional sequences;
- fostering reflective practice;
- enabling context-and content dependent knowledge construction; and
- supporting collaborative construction of knowledge through social negotiation.

The web, web-based learning environments, and wikis support learning based on constructivism by providing different ways of communication. The social constructivist theory in particular emphasizes the influences of cultural and social contexts and interaction in learning (Vygotsky, 1978). In the same way KM emphasizes the meaning of interaction and knowledge sharing.

The need of knowledge is another issue that should be taken consideration. Citing an example, the differences between the war fighter of the future and knowledge worker of the future is the choice of battlegrounds and weapons to win. Both need unparalleled situation awareness and knowledge that automatically flows to the need (Boeing, 2007). In a world with fewer borders, more information, working with global stakeholders, and leveraging knowledge on a global scale, and KM in a borderless environment where knowledge is instantly leveraged for innovation, competitive advantage, sustainable performance, and enhanced productivity to create and empower an adaptable and agile workforce with new skills through constructivism is possible to rapidly respond to market drivers or industry needs.

Our approach was made by using all the above principles. And in the realization of this our aim also was that students are needed to use KM tools and discuss the concepts and issues included in KM and KM tools.

Problem-based learning is one implementation of the constructivist model of learning and the practical implementations of it can vary (Nuldén, 1999). By applying problem-based learning to constructivist learning students can concentrate on what is really difficult. According to Ellis *et al.* (1998), in a problem-based learning environment, students work in groups on real-life problems and have the opportunity to determine for themselves what they need to learn in the relevant subject area. Cook (1992) argues for negotiating the curriculum with students in constructivist teaching. Students will be more focussed, hard working, and result oriented provided they are discovering their own ideas, with their own questions, and finding ways and solutions of their questions. In this context, a student-centred constructivist teaching, learning, and classroom is more desirable in achieving not only new innovations but for creating new sets of skills.

In our approach the students familiarize themselves with an area to learn first. This phase is followed by determining difficult concepts to learn, which also constitutes the basis for the assignment. Search engines and directories are used by the students to deepen their knowledge of different concepts. A presentation is prepared and thus students can bring fresh and clarifying views for themselves and fellow students in their own language.

3. Activities involved in KM

KM is sharing knowledge. It includes sharing both explicit and tacit knowledge.

The main aims and objectives of a KM initiative are to make knowledge visible mainly through maps, yellow pages and hypertext, to develop a knowledge-intensive culture and to build a knowledge infrastructure. There are four phases of knowledge transfer as follows (Nonaka and Takeuchi, 1995, p. 25):

- Socialization mode refers to the conversion of tacit knowledge to new tacit knowledge through social interactions and shared experience.
- Combination mode refers to the creation of new explicit knowledge by merging, categorizing, reclassifying, and synthesizing existing explicit knowledge

- Externalization refers to converting tacit knowledge to new explicit knowledge
- Internalization refers to the creation of new tacit knowledge from explicit knowledge.

Knowledge sharing is the exchange of ideas, insights, solutions, experiences to another individuals via knowledge transfer computer systems or other non-IS methods.

Knowledge seeking is the search for and use of internal organisational knowledge.

In the course arrangements for a KM course it is essential to comprehend the meaning of these KM initiatives. The course arrangers should include an assignment utilizing KM tools as the core point of the course. It enables teaching and learning KM in the spirit of social constructivist theory. In next section we explain how this can be realized in practice.

4. Teaching KM to university students in three different countries

At the University of Jyväskylä in Finland, the course “Information management and information systems development” includes four themes, namely:

- (1) an administrative view to management of information resources;
- (2) a technological view to management of information resources;
- (3) the building of information systems; and
- (4) organisational applications.

The course was inspired by a textbook, *Information Technology for Management: Transforming Business in the Digital Economy* (Turban et al., 2002). The course normally lasts seven weeks including 36 hours of lectures, a feasibility study as coursework and the final exam. In addition material and activities are provided on the web to support the lectures in the constructivist fashion combining both cognitive and social constructivism as well as problem-based learning.

In order to utilise problem-based learning and constructivism a coursework was organised. The students were expected to learn difficult course themes based on self-defined problems by familiarising themselves with the lecture handout of the course (128 pages) and by trying to find five difficult matters which should be better clarified. Based on these problems they were expected to search for more information from the web. This was aiming to improve their understanding of potential difficult matters in the provided material. The students had to report what useful links they had found by using search engines and directories. They were expected to create Powerpoint slides that included examples of what they have learned. The Powerpoint slides were the basis for videos composed by using Windows Media Encoder. The students were also expected to clarify to other students what they can learn by seeing examples on the web. In order to promote the students’ participation in the optional coursework (individual task or in groups of two or three students), the students received credits for the final examination by completing the coursework within six-and-a-half weeks before the final examination.

The groups placed the videos on a Wetpaint wiki web site and created links to the videos on different servers. In this way Wetpaint enabled the single-point access to all the video material created by the students. Other groups were expected to familiarize themselves with these presentations. Additionally, it was possible to attach comments

regarding any work of other groups on this workspace. The discussion forums of Wetpaint were used for this purpose. The duration of the video-creation was six weeks. The following week the groups were expected to comment on three other coursework presentations. These comments were placed in Wetpaint's discussion forum. In the comments the students were expected to clarify what they had learned by watching other students' videos. This part of the coursework was designed in the spirit of the social constructivist learning theory. More detailed reports including statistics of the results and lessons learnt can be found in (Makkonen, 2000, 2010a).

Shorter versions of the course were taught within the Erasmus Teaching Exchange programme to students at Johannes Kepler University in Linz, Vienna University of Technology and at Alexander Technological Educational Institution of Thessaloniki, Greece in November 2010. In Greece the course consisted of two hours theory and two hours laboratory (hands-on) in a Management Information Systems optional course, in the seventh semester. Despite the fact that all students had not participated in the theory class regarding KM (Makkonen, 2010a) the laboratory class was considered a success by the students confirmed by comments, such as:

In the beginning I did not understand a word, but after we understood what we were expected to do and we started to work together in groups on the concepts then I realised that learning by doing is a very good way of learning.

It was very useful because we had to familiarize yourself with one knowledge management approach, application or technique and to create the video by responding to different questions, for example to find examples of tacit and explicit knowledge and to explain the key technical features in the web-page we had chosen to analyse.

The core point in these short courses was that the students were sharing tacit knowledge at videowikis. A KM tool Wetpaint was in use. The students were expected to watch videos produced by other groups. In the laboratory classes they needed to familiarize themselves with one KM tool and create a video presentation dealing with this tool onto a videowiki. The students learn the basics concerning four KM tools as well as how to share knowledge in this course setting. The KM tools included a tool included their own presentation and watching videos concerning three other groups.

5 Conclusions, recommendations and further work

In this paper we reported on the results of the courses dealing with a KM topic. We explained how we build on the realistic setting for our KM courses. We need learning theories and we apply appropriate KM tools for this. Learning theories include constructivism and in addition the learning theory of the web 2.0 era connectivism can be useful in pedagogical planning of courses (Siemens, 2004; Makkonen, 2010b). In our context social constructivist theory is the most fruitful because KM emphasizes issues that are common for social constructivism.

The challenge in the future involves more vivid learning experiences by combining social constructivism, knowledge management and students' participation. The students of the digital era have learned virtual working at the primary school level. In the spirit of the ideas given by Cook (1992) this enables that we can create course syllabuses based on students' own experiences. Especially, this is possible when we try to teach knowledge management. Our future work will involve realizing these ideas at the course syllabus and curriculum level.

References

- Alavi, M. and Leidner, D.E. (2001), "Review: knowledge management and knowledge management systems: conceptual foundations and research issues", *MIS Quarterly*, Vol. 25 No. 1, pp. 107-36.
- Boeing (2007), "Frontiers (sharing what we know)", available at: www.boeing.com/news/frontiers/archive/2007/october/oct07frontiers.pdf (accessed 12 January 2011).
- Cook, J. (1992), "Negotiating the curriculum: programming for learning", in Boomer, G., Lester, N., Onore, C. and Cook, J. (Eds), *Negotiating the Curriculum: Educating for the 21st Century*, The Falmer Press, London, pp. 15-31.
- Davenport, T.H. and Prusak, L. (1998), *Working Knowledge: How Organisations Manage What They Know*, Harvard Business School Press, Boston, MA.
- Davis, J.G., Subrahmanian, E. and Westerberg, W. (2005), "The 'global' and the 'local' in knowledge management", *Journal of Knowledge Management*, Vol. 9 No. 1, pp. 101-12.
- Ellis, A., Carswell, L., Bernat, A., Deveaux, D., Frison, P., Meisalo, V., Maayer, J., Nulden, U., Rugelj, J. and Tarhio, J. (1998), "Resources, tools, and techniques for problem based learning in computing", *ACM SIGCSE Bulletin*, Vol. 30 No. 4, pp. 45-60.
- Georgiadou, E. and Siakas, K. (2011), "KASL – II: a dynamic four loop model for knowledge sharing and learning", *Journal of Software Maintenance and Evolution: Research and Practice*, Vol. 23.
- Jonassen, D.H. (1994), "Thinking technology", *Educational Technology*, Vol. 34 No. 4, pp. 34-7.
- Kanter, V.D. (1999), "Knowledge management, practically speaking", *Information Systems Management*, Fall, pp. 7-15.
- Makkonen, P. (2000), "Do WWW-based presentations support better (constructivistic) learning in the basics of informatics?", *Proceedings of the 33rd HICSS, Hawaii International Conference of Systems Science*, IEEE Computer Society Press, New York, NY, January.
- Makkonen, P. (2010), "Videowiki as a tool in an information systems science course", *Proceedings of the 45th Decision Sciences Institute Annual Meeting, Decision Sciences Institute, Athens, GA*, available at: <http://users.jyu.fi/~pmakkone/cs/thessaloniki/> (accessed 16 December 2010).
- Makkonen, P. (2010b), "Combining wikis and screen capture videos as a part of information systems science course", *Proceedings of the AMCIS (Americas Conference on Information Systems) 2010 Conference, Association for Information Systems, Atlanta, GA*, available at: <http://aisel.aisnet.org/amcis2010/25/> (accessed 16 December 2010).
- Nonaka, I. and Takeuchi, H. (1995), *The Knowledge-creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York, NY.
- Nulden, U. (1999), "PIE – problem based learning, interactive multimedia and experiential learning", in De Bra, P. and Leggett, J.J. (Eds), *Proceedings of World Conference on the WWW and Internet*, Vol. 1, Association for the Advancement of Computing in Education (AACE), Charlottesville, VA, 24-30 October, pp. 816-21.
- Siakas, K. and Georgiadou, E. (2008), "Knowledge sharing in virtual and networked organisations in different organisational and national cultures", in Bolisani, E. (Ed.), *Building the Knowledge Society on the Internet, Part 1*, Idea Publishing, Hershey, PA, pp. 45-64, Ch. 3.
- Siemens, G. (2004), "Connectivism: a learning theory for the digital age", eLearnSpace, available at: www.elearnspace.org (accessed 20 May 2008).
- Spiegler, I. (2000), "Knowledge management: a new idea or a recycled concept?", *Communications of the Association for Information Systems (AIS)*, Vol. 3, June, Article 14, pp. 1-23.

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28,5

Tanriverdi, H. (2005), "Information technology relatedness, knowledge management capability and performance of multi-business firms", *MIS Quarterly*, Vol. 29 2, June, pp. 311-34.

Turban, E., Leidner, D., McLean, E. and Wetherbe, J. (2008), *Information Technology for Management, Transforming Organizations in the Digital Economy*, John Wiley & Sons, New York, NY.

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Turban, E., McLean, E. and Wet, J. (2002), *Information Technology for Management: Transforming Business in the Digital Economy*, John Wiley & Sons, New York, NY.

Vygotsky, L.S. (1978), *Mind and Society*, Harvard University Press, Cambridge, MA.

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