

Knowledge Management Curriculum Development: Linking with Real Business Needs

Celina M. Olszak and Ewa Ziemba
Karol Adamiecki University of Economics, Katowice, Poland

celina.olszak@ae.katowice.pl; ewa.ziemba@ae.katowice.pl

Abstract

The aim of the article is to present the key assumptions related to the development of a new specialization, *Knowledge Management in an Organization* in the Economics Programme, at the University of Economics in Katowice (Poland). The fundamental reasons behind the launch of such a specialization, which would equip students with unique skills related to knowledge management and application of various IT (Information Technology) tools, are presented against the background of the knowledge paradigm and demands of the labour market. The theoretical deliberations concerning knowledge-based organizations were confronted with the results of the research conducted among 160 companies operating in the Silesian region in Poland. This area is a potential labour market for numerous graduates of the University of Economics in Katowice. The aim of the research was to diagnose competences (knowledge and experience) of various organizations in knowledge management and IT applications. The research was carried out by means of a standardized interview technique, using a survey questionnaire. The findings were used to define the objectives of the specialization *Knowledge Management in an Organization*, a future graduate's profile and his/her main competences. The article presents the teaching curriculum and the aims of specific subjects, for Bachelor's and Master's degree studies.

This paper is addressed to those interested in the development of the specialization at their universities, as well as students, managers and potential employers. The research findings may also prove useful in the development of other specializations, related to knowledge-based economy and information society in broad terms.

Keywords: knowledge management, knowledge organization, teaching curriculum

Introduction

Competition in the modern business world is not solely based on formal competences any more. Intangible and intellectual competences, leading to new 'smart' products, services and unique alliances with customers and business partners, are becoming increasingly important.

Material published as part of this publication, either on-line or in print, is copyrighted by the Informing Science Institute. Permission to make digital or paper copy of part or all of these works for personal or classroom use is granted without fee provided that the copies are not made or distributed for profit or commercial advantage AND that copies 1) bear this notice in full and 2) give the full citation on the first page. It is permissible to abstract these works so long as credit is given. To copy in all other cases or to republish or to post on a server or to redistribute to lists requires specific permission and payment of a fee. Contact 0HPublisher@InformingScience.org to request redistribution permission.

Knowledge or intelligence, to be more specific, is the essence of a modern organization, making companies with similar material resources and similar operating conditions obtain differing results.

"Knowledge", which is a derivative of "information", dates back to the times of Plato and Aristotle. In the 80's of the last century, the researchers and practitioners dealing with expert systems and

artificial intelligence pointed at knowledge and possibilities of its transformation by the means of information technologies (Ignizio, 1991; Walker, McCord, Sowa, & Wilson, 1990). D. Bell, M. Polanyi, A. Toffler and I. Nonaka present the modern meaning of knowledge (Bell, 1973; Johannessen, Olaisen, & Olsen, 2001; Nonaka, & Takeuchi, 1995; Toffler, 1980). It is identified with an organization's assets, its memory, key competences etc. (Awad, & Ghaziri, 2004; Davenport, & Prusak, 1998; Davydow, 2000; Gabberty, & Thomas, 2007; Kirikowa, & Grundspenkis, 2000; Tiwana, 2000). Nowadays, knowledge is often looked upon in terms of tacit and explicit knowledge, as well as procedural knowledge (of how to perform tasks and specific procedures), declarative knowledge (of what should be done), semantic knowledge (highly organized, linked to mutual dependencies between facts, relations etc) and episodic knowledge (based on experiences and happenings).

An organization's intelligence should be judged by its usefulness in decision-making and obtaining highly developed strategic competences. It is manifested in an ability to come up with innovative and quick solutions, i.e. knowledge implementation in processes, products, services and relations it creates with its immediate and distant environments. Analytical thinking and free information flow at all management levels contribute to business intelligence (Olszak, & Ziemba, 2003).

A concept of a knowledge-based organization, also referred to as a learning organization, an intelligent organization or a network organization, has become a popular alternative to the model of an enterprise which only uses its material capital. Such an organization is assumed to demonstrate the following characteristics (Liebowitz, 2000; Olszak, & Ziemba, 2003, 2008b; Sarvary, 1999; Tiwana, 2000):

- what matters are the organization's unique competences, instead of its material resources; and they lead to a competitive advantage;
- knowledge and ideas are subject to management;
- change is a permanent state in the organization;
- hierarchy and bureaucratic structures are replaced by non-formal relations and networks;
- composition of working teams often changes;
- every member of the organization is expected to be innovative;
- individual members possess vast resources of knowledge, which is often difficult to share with others and, as a result, these employees are difficult to replace; and
- there is a specific strain between autonomy and control, freedom and responsibility.

The fact that knowledge is regarded as the main resource of the modern organization justifies the need for the creation of system solutions and conditions for knowledge management. The literature and experience point at two basic knowledge management dimensions. The first, organizational ('soft'), is connected with the intellectual potential of people, their creativity, skills and experience, and the organization of business processes. The other – technological ('hard') refers to utilization of information technologies to support knowledge management.

When analysing these dimensions, it appears clear that knowledge management in an organization is facilitated by the coordination among the three important elements (Awad, & Ghaziri, 2004):

- People – who create individual and collective knowledge by learning, knowledge sharing, problem solving, integrating knowledge with corporate culture, in order to finally launch better and better products and services.
- Processes – which should be regularly updated with currently available information and knowledge, and improved adequately.

- Technologies, and in particular information technologies – which should be developed in line with market demands, in reply to competitors' activities and based on a company's resources.

In this situation it would be difficult not to agree with an opinion that knowledge management competences are becoming outstanding skills, which are sought by organizations. The research findings show that these may become a source of relatively long-term competitive advantage, a source which is hard to imitate and leads to the creation of new values and services. To acquire such skills is not an easy task.

Methodology of Research and Findings for Knowledge Management Competences in Organizations

It has been proven many times that the assumptions presented in the literature of the subject and related to knowledge management, are not always translated into business practice. There is a continuous big gap between the theory and the reality in which businesses operate. This was also confirmed by the research conducted in 2008. The research was carried out by means of a standardized interview technique, using a survey questionnaire. It was conducted by professional interviewers. The statistical software SPSS was applied for the analysis of respondents' answers.

The aim of the research was to diagnose competences of various organizations in knowledge management and IT applications. The research was focused on organizations from the Upper Silesia region, which belongs to the fastest growing regions in Poland. The sample contained 160 organizations. In fact, there were many more companies invited to participate in the research. It turned out, however, that many of them did not decide to cooperate because knowledge management was a new topic for them and they did not have much to say about it. The research was conducted among small and medium enterprises, which represented the private sector. Majority of respondents belonged to top and middle management, business owners and IT specialists.

Due to the fact that knowledge is a strategic resource in a knowledge-based organization and knowledge management is its distinguishing competence, the awareness of these imperatives in organizations was examined (Table 1). The research findings show that less than half of the organizations surveyed are fully aware of the fact that knowledge is an important resource, since it determines competitiveness of an organization. The results are still less promising when it concerns the second imperative – the knowledge management concept is commonly known in approximately 28% of the organizations. However, the fact that part of the organizations are currently carrying out, or planning to carry out, activities aimed at promotion of knowledge and knowledge management, and others regard promotional activities as worth doing, seems quite promising. Even a quick look at the findings shows that the knowledge management theory is not sufficiently promoted in the business environment, which is also confirmed by the remaining findings.

The organizations still do not know where to find the knowledge they need and how this knowledge can be applied. The specific sources of knowledge are, in most cases, explored to an average or insufficient extent (Table 2). The internal sources of knowledge are the best known and exploited, but the situation is much worse when it concerns the external sources. Also, the organizations face many difficulties when identifying the sources of explicit and tacit knowledge.

It is important for the organizations to realise that competences are related to identification and applications of specific categories of knowledge and its sources, as well as skilful and efficient knowledge management. Only 22.7% of the organizations evaluated their competences in this respect as totally sufficient, whereas 48.4% of the organizations see them as average, and 16.4%

of them as insufficient. Some respondents were generally unable to say what competences they have in terms of knowledge management (7.5% of the answers provided).

Table 1: Imperative knowledge in knowledge-based organizations

Level of the imperative knowledge	Knowledge as a strategic resource	Knowledge management as a strategic process
Commonly known to employees at all levels of management	44.40%	28.54%
Not commonly known in an organization but some actions are being now undertaken to promote the concept among its employees	15.04%	17.74%
Not commonly known in an organization but its promotion is thought to be important	14.44%	18.44%
Not commonly known in an organization but some activities are planned to promote the concept among organization employees	6.94%	11.44%
Not commonly known in an organization and its promotion is thought to be unjustified	6.34%	9.54%
It is difficult to say	13.14%	14.64%

Source: (Olszak, & Ziemba, 2008a).

Table 2: Assessment of the level of use of knowledge in organizations

Sources of knowledge	Level of knowledge of sources / Level of use of knowledge			
	totally sufficient	average	insufficient	it is difficult to say
Internal sources of knowledge	55.0% / 60.0%	36.3% / 31.9%	6.3% / 5.0%	2.5% / 3.1%
External sources of knowledge	25.0% / 32.1%	51.9% / 49.1%	14.4% / 11.9%	8.8% / 6.9%
Sources of explicit knowledge	39.0% / 35.6%	38/4% / 37.5%	8.2% / 13.8%	14.5% / 13.1%
Sources of tacit knowledge	30.2% / 30.8%	32.1% / 39.0%	11.3% / 8.8%	26.4% / 21.4%

Source: (Olszak, & Ziemba, 2008a).

The experience shows that managers of organizations have to overcome the barriers to the introduction and application of knowledge management in an organization, which include lack of knowledge about opportunities and benefits resulting from knowledge management (29.9% of the answers provided), lack of experience in knowledge management (28.0% of the answers provided), lack of general knowledge about knowledge management (27.0% of the answers provided) or lack of any idea of how to introduce and apply knowledge management (18.6% of the answers provided). The respondents also mentioned:

- a lack of managers’ commitment to knowledge management;
- cultural barriers in an organization;
- a lack of synergy between a corporate strategy and knowledge management; and

- high costs related to the execution of knowledge management implementation projects (Table 3).

Table 3: Barriers to introduction and application of knowledge management in organizations

Specification	Answers provided	Percentage
Lack of knowledge about opportunities and benefits resulting from knowledge management	64	29.9%
Lack of experience in knowledge management	60	28.0%
Lack of general knowledge about knowledge management	58	27.0%
Lack of any idea of how to introduce and apply knowledge management	40	18.6%
Lack of managers' commitment to knowledge management	35	16.4%
Cultural barriers in an organization (e.g. employees' concerns, lack of motivation, non-adapted organizational structures)	34	15.9%
High cost	28	13.0%
Lack of corporate strategy integration with knowledge management	20	9.4%
Other (specify)	2	1.0%

Source: (Olszak, & Ziemia, 2008a).

The conducted research confirmed also the thesis that the use of information technologies to support knowledge management in organizations is not sufficient. It turned out that the people surveyed most often indicated those information technologies which had already been in use before the efforts and experiments related to knowledge management were made and carried out, e.g. electronic mail, databases, spreadsheets, word processors and browsers. The respondents less frequently indicated the use of the Internet and HTML documents, and half of the companies declared that they used group work systems such as Lotus Notes, Outlook/ Exchange, Oracle, WiseGroup and communicators such as Gadu-Gadu or Skype. Unfortunately, there is hardly any use of the technologies which can be described as dedicated to knowledge management, e.g. data warehouses, OLAP (On-Line Analytical Processing) and Business Intelligence systems, data mining. Document management systems, competence management systems and work flow systems are used slightly more (Table 4).

Organizations notice that the application of information technologies in knowledge management requires overcoming certain barriers and difficulties. These are, mainly: a lack of funds (33.4% of the answers provided), a lack of knowledge about opportunities offered by IT in supporting knowledge management, a lack of experience in the implementation of information technologies to support knowledge management (32.8% of the answers provided each) and a lack of any idea of how to use information technologies to support knowledge management (22.1% of the answers provided). The ones surveyed also mentioned a lack of integration between information technologies, a corporate strategy and a knowledge management strategy, technical problems, a lack of integration of information technologies which support knowledge management, legal problems and problems connected with safety (Table 5).

Table 4: Assessment of the use of particular IT categories in knowledge management

Information technologies	The level of IT use	
	Answers provided	Percentage of answers provided
Electronic mail	127	97.7%
Data bases	119	91.5%
Spreadsheets	111	85.4%
Word processors	105	80.8%
Search engines	105	80.8%
Web mining	91	71.1%
HTML documents	79	60.8%
Workgroup systems	66	50.8%
Communicators	66	50.8%
Information technology management systems	63	49.2%
Text mining	59	46.1%
Electronic bulletins	47	36.2%
Synchronic trainings	44	33.8%
Synchronic trainings	41	31.5%
Documentation management systems	38	29.7%
Teleconferences (video and audio teleconferences)	30	23.1%
XML documents	27	20.8%
Data warehouses	26	20.0%
Knowledge data bases	25	19.2%
Discussion lists	18	13.8%
Discussion forums	18	13.8%
Systems of competence management	16	12.5%
Exploration of data from data bases	15	11.7%
Systems of workflow management	14	10.9%
Expert systems	13	10.2%
Chat rooms	12	9.2%
Categorization and taxonomy systems	11	8.6%
Content management systems	10	7.7%
Business Intelligence systems	6	4.7%
OLAP	6	4.7%
Ontology systems	2	1.6%

Source: (Olszak, & Ziemia, 2008a).

The conducted research may lead to the following final conclusions:

- the importance of knowledge and knowledge management in building of a competitive advantage is not fully appreciated by the organizations;
- the organizations fail to notice the complexity of knowledge and knowledge management;
- the organizations perceive their own competences, related to introduction and application of knowledge management, as poor;

- the organizations fail to notice the complexity of the application of information technologies to support knowledge management, and information technologies dedicated to knowledge management are used to a very small extent;
- difficulties in the implementation and application of knowledge management concepts result mainly from a lack of competences in the area of knowledge management; and
- difficulties in the application of information technologies to support knowledge management result mainly from a lack of (funds and) knowledge about opportunities offered by information technologies in supporting knowledge management and a lack of experience in their implementation and application.

Table 5: Barriers to application of information technologies in knowledge management

Specification	Answers provided	Percentage
Lack of funds	50	33.4%
Lack of knowledge of opportunities offered by information technologies in supporting knowledge management	49	32.8%
Lack of experience in implementation and application of information technologies to support knowledge management	49	32.8%
Lack of any idea of how to implement and apply information technologies to support knowledge management	33	22.1%
Lack of integration between information technologies, a corporate strategy and a knowledge management strategy	25	16.8%
Technical problems	21	14.0%
Lack of integration between information technologies which support knowledge management	11	7.4%
Legal problems and problems connected with safe application of information technologies in knowledge management	10	6.8%
Others (specify)	4	2.7%

Source: (Olszak, & Ziemia, 2008a).

Taking into account the presented situation, it may be concluded that the introduction of the knowledge management concept into Polish organizations and its use in order to build a competitive advantage require: increasing an organization's awareness, knowledge and skills related to knowledge management and application of information technologies. Therefore, a priority for Polish organizations should be to improve their competences in the areas of knowledge management and the application of information technologies and systems in this process. It is worth mentioning that not only is this situation peculiar to Polish organizations. The experience and research conducted in other countries point at the negligence in the field of knowledge management concepts implementation and lack of organization competences in this respect (Markkula, 2006; Winkler & Mandl, 2007).

Curriculum of Knowledge Management in an Organization and Syllabus Based on Organizations' Competences and Needs

Teaching Aims and a Graduate's Profile

The new conditions in which organizations have to operate and the need to build and improve competences in the areas of knowledge management lead to new labour market requirements which university graduates have to meet. In order to manage knowledge resources, managers and staff members should know and use the knowledge management concept.

The University of Economics in Katowice has decided to rise to the new challenges and the demands of the labour market and the expectations of secondary school leavers. The Faculty of Economics, within the programme of Economics, has launched a new specialization: *Knowledge Management in an Organization* at the Bachelor's and Master's degree studies. The work on this specialization was conducted in 2008 and 2009 by a team from the Department of Business Informatics.

The students of the Economics Faculty who apply for the specialization have already gained vast knowledge of management, economics and finance while have been learning subjects such as: Microeconomics, Macroeconomics, Management, Accounting, Economic Analysis, Money and Capital Markets, Human Resources Management, Managerial Economics, Economic Law, Statistical Interference, Forecasting of Economic Processes, Mathematics and Statistics. The new specialization will allow students to improve their economic competences. The main aim of the specialization is to provide students with comprehensive knowledge and skills related to knowledge management in modern organizations, using information technologies and systems.

During the studies, students acquire the knowledge and practical skills which enable them to search for, gain, collect, apply and share knowledge, and to carry out business intelligence, information resources audits and business process management. They learn how to efficiently use information systems and technologies in knowledge management. Many classes are held in specialized computer laboratories where students get to know the software of leading Polish and international companies.

Such competences are nowadays indispensable at numerous positions. Students may become high-class managers, advisers, analysts, tax administration controllers and auditors, who are not afraid of new concepts for information technologies management. In addition, they take advantage of any benefits these technologies offer. They are prepared to work for enterprises, consulting firms, research agencies, business intelligence agencies, banks and financial institutions and public administration offices. For instance, they gain competences in order to (Figure 1):

- manage an organization's information resources;
- supervise an information policy and manage information in an organization;
- design and carry out reengineering of an organization's information infrastructure;
- design and carry out reengineering of business processes;
- control and carry out audits of various areas of an organization's activities;
- supervise information projects within an organization; and
- plan, implement and use e-business solutions.

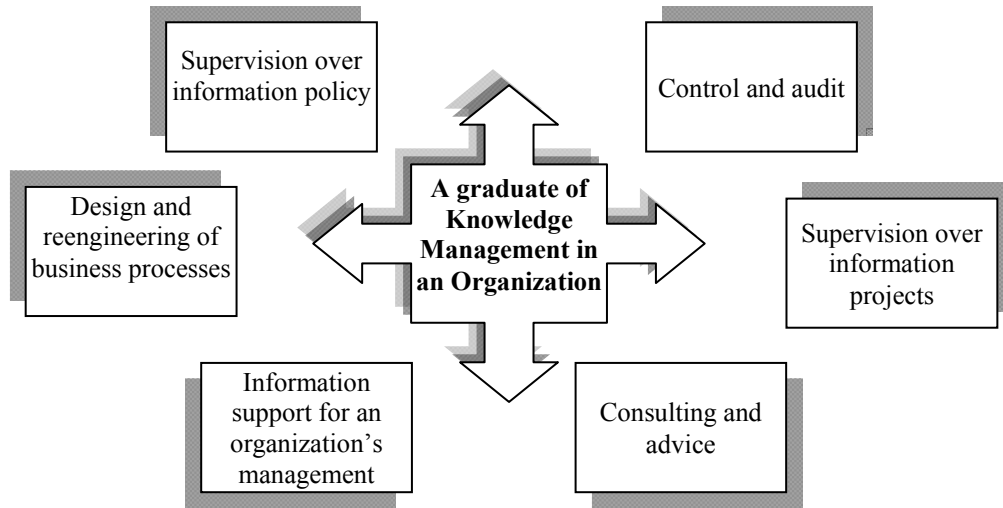


Figure 1. A place occupied by a graduate of Knowledge Management in an Organization on the labour market

Teaching Curriculum for the Specialization of Knowledge Management in an Organization

In order to meet the aims of the specialization and achieve the teaching goals, in form of the described graduates' competences, students' education is based on the main thematic modules, such as:

- knowledge-based economy and information society;
- e-business strategies and models;
- information support for business processes using ERP software; and
- data analyses and information audit using IT tools.

The courses provided within these thematic modules are listed in Table 6 and described below (the academic year is divided into two semesters in Poland).

Table 6: Teaching curriculum for the specialization of Knowledge Management in an Organization

No.	Course	No. of hours/a semester		Credits	Completion	Semester
		class	lecture			
Bachelor's degree studies						
1.	Management of information resources in a knowledge-based organization	30	30	5	final grade/exam	3
2.	Information collection methods and techniques	30	30	5	final grade/exam	4
3.	Information technology support for business processes	30	30	5	final grade/exam	5
4.	Use of the Internet in knowledge-based economy	30	30	5	final grade/exam	5
5.	Information processing methods	30	30	5	final grade/exam	5
6.	Business intelligence	30	30	5	final grade/exam	6
7.	Information technologies in knowledge management	30	30	5	final grade/exam	6

Master's degree studies						
1.	Customer relationship management	30	30	6	final grade/ exam	3
2.	Audit of information resources	30	30	6	final grade/ exam	3
3.	Corporate portals for knowledge-based organization	--	30	4	final grade	4
4.	Security and protection of information resources	--	30	4	final grade	4

The presented courses are obligatory for students who attend this specialization. Furthermore, students are obliged to complete so-called “optional” courses. Every student has to complete courses within this group by attending the total of 360 hours at the Bachelor’s level and 180 hours at the Master’s level. Students may be offered the following courses to choose from:

- Communication on the Internet (Bachelor’s degree studies);
- On-line information search systems (Bachelor’s degree studies);
- Trade and electronic markets (Bachelor’s degree studies);
- Business intelligence using computer tools (Bachelor’s degree studies);
- On-line business portals (Bachelor’s degree studies);
- E-business strategies and models (Master’s degree studies);
- Simulations and computer decision-making games (Master’s degree studies); and
- Information project management (Master’s degree studies).

Description of Degree Courses and Their Aims

Management of information resources in a knowledge-based organization

The subject allows students to get acquainted with the issues of knowledge-based organizations, knowledge management and an organization’s competences related to knowledge management. Students obtain practical skills, allowing them to use the selected information technologies and systems (the Internet, databases, data warehouses) in knowledge management. They learn how to use knowledge when making strategic, tactical and operational decisions.

Information collection methods and techniques

The aim of the subject is to provide students with the knowledge of most modern methods and techniques for collection of information, which are required for decision-making processes. Students learn how to: diagnose decision-makers’ information needs, identify information sources and holders, select information search sources and methods (primary and secondary ones), collect information and prepare collected data for analyses (databases).

Information technology support for business processes

Students get acquainted with the notion and applications of process management and gain practical skills, allowing them to carry out business processes using integrated information systems of ERP (Enterprise Resources Planning). They use different management information systems, made by such companies as SAP, SAS etc.

Use of the Internet in knowledge-based economy

The aim of the subject is to make students acquainted with the opportunities offered by the Internet in knowledge-based organizations. Students learn how to select and evaluate online technolo-

gies, used to manage knowledge in an organization. They get familiar with the issues of planning, design and use of online applications.

Information processing methods

Students learn about information processing methods, which are applicable to data from primary and secondary sources of information. A significant part of classes are devoted to SPSS software. The acquired knowledge and practical skills prove useful, in particular at analysts' positions in organizations.

Business intelligence

The subject introduces students to the issues of business intelligence, including data analyses and exploration. Students learn how to use various information techniques and tools, e.g. SAS, ACL tools, in order to carry out business intelligence. In small teams, they work out approaches and rules for monitoring of a company and its environment.

Information technologies in knowledge management

Students get familiar with the processes of selection and introduction of information technologies and systems, designed for knowledge management, into organizations. In their project teams, they work out model strategies for the use and implementation of various IT solutions and adjust them to the needs of a given organization, a specific market or customers.

Customer relationship management

Students get familiar with the notion of customer relationship management. A significant part of classes are devoted to information systems, which are used to support customer relationship management, and their practical applications. Many tasks are performed using the different CRM systems. Students learn how to liaise and cooperate with customers with the help of different IT tools.

Audit of information resources

The aim of the subject is to familiarise students with the concept and types of audits, as well as the techniques used to perform them. Students learn how to identify an organization's information resources, in order to effectively and smoothly perform an audit and analyse various types of data. They verify the theoretical audit issues in practice, by using ACL tools to analyse financial, freight forwarding and sales processes etc.

Corporate portals for a knowledge-based organization

The subject introduces students to the issues of corporate portal functionality and design in knowledge-based organizations. Students analyse practical examples of corporate portals and their applications in companies. The acquired knowledge and skills are used when designing of a corporate portal for a selected organization.

Security and protection of information resources

Students get familiar with threats, safety and protection of information resources, in particular, the e-business environment. The subject focuses on ensuring safety of information, IT equipment and software, as well as data transmission. Students learn about the aspects of knowledge-based economy. They learn how to establish a safety policy in a company. In their project teams, they work out rules and procedures for protecting information for selected organizations.

Conclusions

The developed concept of the specialization, *Knowledge Management in an Organization*, enables students to acquire knowledge and competences which are increasingly sought by organizations and future employers. The specialization is targeted at meeting the assumptions underlying knowledge-based organizations. As the curriculum is not specific for the situation in Silesia, in Poland, it, therefore, might be applicable to any universities in the world.

The empirical research conducted in the selected companies, which involved, first of all, finding out their expectations and competences related to knowledge management, had a big impact on the contents of the specialization. Lectures and classes are grouped in four modules: (1) knowledge-based economy and information society, (2) e-business strategies and models, (3) information technology support for business processes using ERP software, (4) data analyses and information audits using ACL tools. It should be emphasized that some courses are to be conducted together with business practitioners. The future aim for students is also to complete some of these modules, receiving appropriate certificates confirming their skills.

For the authors of the specialization of *Knowledge Management in an Organization*, the academic year of 2010/2011 means promotional activities, aimed at the dissemination of the new educational offer, as well as enrolment activities. In the future it is also planned to start post-graduate studies and address the offer to various companies.

References

- Awad, E. M., & Ghaziri, H. M. (2004). *Knowledge management*. New Jersey: Prentice Hall.
- Backhouse, J., Liebenau, J., & Land, F. (1991). On the discipline of information systems: Conflict in the trenches. *Journal of Information Systems*, 1, 19-27.
- Bell, D. (1973). *The coming of post-industrial society: A venture in social forecasting*. New York: Basic Books.
- Davenport, T. H., & Prusak, L. (1998). *Working knowledge. How organizations manage what they know*. Boston: Harvard Business School Press.
- Davydow, M. (2000). The second wave of EIP. *Intelligent Enterprise*, 3(4).
- Gabberty, J. W., & Thomas J. D. E. (2007). Driving creativity: Extending knowledge management into the multinational corporation. *Interdisciplinary Journal of Information, Knowledge, and Management*, 2, 1-15. Retrieved October 30, 2009, from <http://www.ijikm.org/Volume2/IJIKMv2p001-015Gabberty.pdf>.
- Ignizio, J. (1991). *Introduction to expert systems*. New York: McGraw-Hill.
- Johannessen, J. A., Olaisen, J., & Olsen, B. (2001). Mismanagement of tacit knowledge: The importance of tacit knowledge, the danger of information technology, and what to do about it. *International Journal of Information Management*, 21(1).
- Kirikowa, M., & Grundspenkis, J. (2000). Using knowledge distribution in requirements engineering. In C.T. Leondes (Ed.), *Knowledge based systems, techniques and application* (Vol. 1). San Diego: Academic Press.
- Liebowitz, J. (2000). *Building organizational intelligence: a knowledge management primer*. Florida: CRC Press.
- Markkula, M. (2006). *Creating favourable conditions for knowledge society through knowledge management, eGovernance and eLearning*. International Federation of Surveyors. Retrieved November 22, 2009, from http://www.fig.net/pub/monthly_articles/june_2006/june_2006_markkula.pdf.
- Nonaka, I., & Takeuchi, H. (1995). *Knowledge creating organizations*. New York: Oxford University Press.

- Olszak, C. M., & Ziemia, E. (2003). Business intelligence as a key to management of an enterprise. In E. Cohen, & E. Boyd (Eds.), *The Proceedings of Informing Science and IT Education Joint Conference InSITE'2003*. Pori: The Informing Science Institute & Tampere University of Technology. Retrieved October 30, 2009, from <http://proceedings.informingscience.org/IS2003Proceedings/docs/109Olsza.pdf>.
- Olszak, C. M., & Ziemia, E. (2008a). Communities of practice in knowledge management and organizational learning. In F. Burstein, G. Johanson, & H. Thompson (Eds.), *The Proceedings of the 11th Annual Australian Conference on Knowledge Management and Intelligent Decision Support - ACK-MIDS08*. Melbourne: The Monash University.
- Olszak, C. M., & Ziemia, E. (2008b). A conceptual model of ICT for intellectual capital management. In J. Korczak, H. Dudycz, & M. Dyczkowski (Eds.), *Management advanced information technologies for management*. Wrocław: Publishing House of the University of Economics.
- Sarvary, M. (1999). Knowledge management and competition in the consulting industry. *California Management Review*, 41.
- Tiwana, A. (2000). *The knowledge management toolkit*. New Jersey: Prentice Hall.
- Toffler, A. (1980). *The third wave*. New York: Bantam Books.
- Walker, A., McCord, M., Sowa, J. F., & Wilson, W. G. (1990). *Knowledge systems and Prolog: Developing expert, database and natural language systems*. Massachusetts: Addison-Wesley.
- Winkler K., & Mandl, H. (2007). Implementation of knowledge management in organizations. *Learning Inquiry*, 1(1). Retrieved November 30, 2009, from <http://www.springerlink.com/content/b68667571m552674/>.

Biographies



Celina M. Olszak is a Professor of Management Information Systems at University of Economics in Katowice Poland. She is Chair of the Department of Business Informatics and Vice-Dean in Charge of Research at the Faculty of Economics. She was scholarship holder at Swiss Federal Institute of Technology in Zurich, Switzerland and scholarship holder of Deutsche Akademische Austausch Dienst at Trier University in Germany.

She has published numerous articles in the areas of information systems, decision support systems, systems development strategies. Her current research interests include knowledge management, Business Intelligence Systems, e-business and information society. She is a member of Informing Science Institute in California, USA.



Ewa Ziemia is a Professor of Management Information Systems at the University of Economics in Katowice, Poland. She is an author of numerous articles published in journals, conference proceedings and as book chapters. She has written three books on e-business systems, web designing and corporate portals for knowledge management. Her current research concentrates mostly on information systems development methodologies, e-business and information society, information systems for knowledge management, especially designing corporate portals for knowledge-based organizations.

She has participated in several European research project relating to e-business systems and e-learning. Her academic qualifications have been combined with practical experience – she has been working as the IT Project Manager for over ten years. Furthermore, she is a member of Informing Science Institute in California, USA.