Reengineering the Learning Process in a Transport Company

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Abstract Swift changes in the regulations and the organization of the transport sector make innovation an absolute necessity. A company's ability to cope with these changes depends largely on the learning capacity of the organization. Therefore in the transport case described in this paper the company decided that reengineering of the learning strategy was needed to handle the needs of their mobile workforce also in the long term. The strategy is based on a multi dimensional design using sound educational concepts and recent insights in the changing knowledge landscape in combination with Learning 2.0 elements to handle the ever changing learning demands. The multi faceted solution is an integrated cross functional business portal with information, learning and performance improvement as the essential processes in the design. The portal is online and acceptance is clearly growing. Process monitoring and evaluation supply data on the usage and success of this integrated approach.

Keywords: Reengineering, Learning strategy, Transport, Learning 2.0, Business portal

1 Introduction

The transport world in general shows a mastery of logistic processes including the coordinated transport of goods, transport chains, freight handling, time windows, and planning arrangements. This practice is supported by well organized business processes in combination with dedicated transport software to ensure a minimum of errors and a maximum of efficiency. Rapid innovations in the industry and frequent changes in legal issues and governmental regulations endanger the conservation and improvement of that mastery when modernization becomes a burden. One of the actions taken by Van der Wal International Transport, the case discussed here, was to improve the learning capacity of the company to allow for adequate response to the demands for change and innovation. An important issue is the mobility of the workforce of which the majority are truck drivers, who are away from home and office most of their time. A main challenge is to involve this target group in the

information, learning and performance improvement processes that largely define the capacity for innovation in the organization.

Van der Wal international transport is a family owned business founded in Utrecht in the Netherlands in 1924 with presently about 450 employees. The company has a firm base in the Netherlands with branches in Belgium, Poland, Russia, Azerbaijan and Kazakhstan. The company has received several rewards as a fair and green enterprise that operates with respect for people and the environment.

The aspiration of the company is to better integrate information and learning into the business processes to enhance the learning capacity of the organization. This paper covers the analysis of the actual and the desired situation, the concept development based on educational theories and concepts, the implementation and the experiences so far with an innovative information and learning approach for these mobile workers in the transport sector using web 2.0 functionalities.

2   The Research Flow

The overall research plan was based on the Corporate Learning Strategy model, the CLS model [1] [2]. This model is marked by a holistic approach and subsequent phases for the development of a sustainable learning strategy (see figure 1). This allows the development of a clear picture of the actual situation at both the strategic, tactical and operational level of an organization.
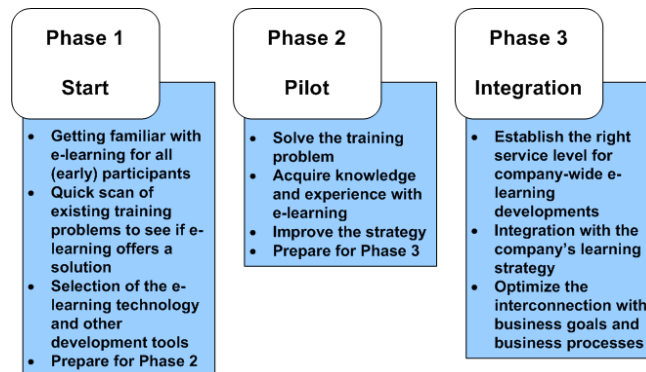
Fig. 1. The Corporate (e-)Learning Strategy Model [3]

The exploration using the CLS analysis framework is structured around a quick scan on five major issues: organization, process, and content, infrastructures and business model. Phase two of the model is the pilot phase, in which solutions are tested in practice and in phase three the focus is on the structural integration of these solutions in the actual business processes of the organization. This paper is about the experiences in the first two phases of the development and the transition process of the innovation into phase three.

2.1   Analysis of Learning Requirements

Although information management, training and learning had never been a priority, management of the transport organization was convinced that these issues had become essential and that there was a strong need for a strategic solution using good theory, good structured processes, a realistic timeline and a sound business plan to recoup the investment. An important goal of information and learning in the eyes of management was to familiarize the employees with the companies' vision, mission and values and have a tool to cope in a sustainable way with new development, change and innovation.

Dominant in the overall analysis is the mobility of the employees, which makes it almost impossible for them to attend courses, workshops or information sessions. Formal training and learning events that are very much time and place restricted have shown to be of little value for the mobile learner, as we define the type of learners in this case. For this learner, other ways must be found to reinforce the information and learning processes [3]. From the analysis it became also clear that learning in a transport company has a multi-dimensional character which can not be served adequately with formal and traditional learning models. The day to day reality comprises a broad spectrum of information exchange associated with learning and communication processes very much linked to workplace related needs for performance improvement.

On the basis of the analysis the following three dimensions of requirements were identified: (1) Information: An information system as a low threshold resource of news and other relevant resources; the need to better connect with the mobile colleagues to reduce isolation; the need to engage all employees in the company's values and vision viewpoint; an information resource as reference for daily tasks (drivers handbook). (2) Learning: A sustainable alternative learning concept to replace ad hoc and incidental learning practices; a concept which is attractive for the target group that arouses interest and fits into the daily working schedule; the 'learning' activity can be monitored for supervision, support and planning, adding transparency to the mostly informal learning process. (3) Performance: Plain job descriptions which allow for KPI's (Key Performance Indicator) reference to establish a clear picture of the performance requirements; the transparency of the job descriptions should allow employees to continuously be aware of the requirements they must comply. These requirements must be translated into clear operational instructions including learning activities when needed. In this way the employee receives guidance which may serve as a structuring element for learning.

2.2   Learning concepts to match requirements

The three dimensions of requirements clarified the goals for the new learning strategy and emphasized the fact that the solution would need to have a multidimensional character. The first step made was to match theoretical concepts with these requirements to be able to cope with the multitude of issues and establish a firm theoretical basis to work with.

Social constructivism. Training Models based on socio-constructivist principles seem to work well for informal, practical, ad-hoc-like, spontaneous learning [4]. Core of the constructivist concept is the premise that we all have our own 'mental model' which is developed in interaction with the world around us [5], [6]. The main principles are that each person is unique with regard to knowledge and experience and that people primarily learn by actively trying and learning always is related to a particular social context. Therefore the learner plays a central role in the development of learning activities with the sole aim to make learning more efficient. As a consequence motivation becomes an important stimulating factor and the individual approach to learning relates very much to the knowledge and experience acquired in the past. The relevance of this concept for the transport case is that the learning demand of the employer is an important trigger for learning to take place.

Connectivisme. The constructivist approach is a strong advocate for the inclusion of informal learning as part of the learning strategy. This approach is supplemented with the concept of Connectivisme that focuses on the changes taking place in society when it comes to knowledge and learning [7]. The knowledge landscape is changing by the array of new information media, like You Tube, Facebook, Wikis, which emerge in a rather quick pace. In this new situation learning is the ability to connect to different 'nodes' of knowledge, which are spread over a network of data, information and people and is called 'connected knowledge' [8]. This observation is relevant in our transport case, because the lorry drivers are increasingly using mobile phones and the Internet in their day to day working environment, which affects their communication patterns, information acquisition, their learning and the development of their social network.

Levels of experience. Assuming that people are unique learners, as conceived in the social constructivist model, they also have a different experience level to be taken into account [9], [10], [11]. Three levels are distinguished: early development, competent and experienced, expert (see figure 2). A newcomer needs good formal and
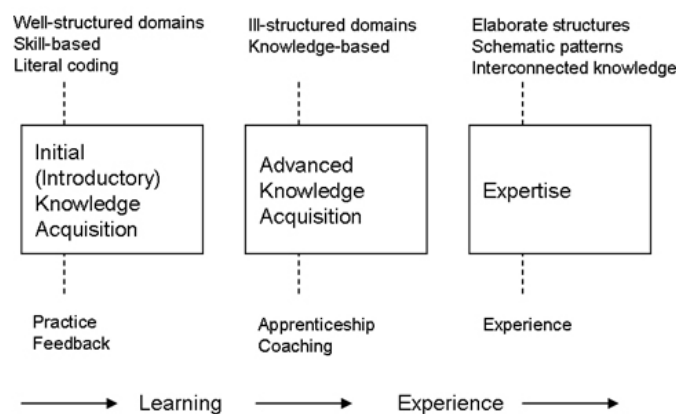
Fig. 2. Levels of Experience [10]

structured learning to acquire basic knowledge and skills in an appropriate fashion. More experienced employees with more knowledge and skills are better served with a largely informal learning situation that better fits the rather ad hoc learning needs, so common for workplace related learning. For people with expert knowledge and experiences, formal and structured learning can even become counter-productive, because it does not fit the very personal learning needs. So in the case of the transport organization this means that a well structured on-boarding program might work very well for newcomers, but for the experienced workers one need to rely much more on the self-initiative of the worker to support his or her learning process.

Formal and informal. The distinction between formal and informal is not based on a strict separation between different learning activities, but the notion that formal education is traditional, class and curriculum bound and informal learning is a predominantly social activity consisting of a mix of learning related actions. In reality we learn all the time, under different circumstances, but apparently more informal than formal. Cross [12] states that 80% of the knowledge we need to do our work well is obtained through informal processes, the remaining 20% through formal channels. Obviously this is not yet common ground for learning professionals, because about 80% of the training budget is spent on formal business training efforts. This can be qualified as an over-investment which shows that many professionals are unaware of the possibilities offered by more natural and informal learning to increase the learning capacity of an organization. Cross [12] describes this phenomenon as the 'Spending & Outcome' paradox. The notion of formal and informal learning very much relates to the concepts of social constructivism, connectivism and levels of experience and clarifies that in daily practice the company can profit much more from the support of informal learning than continue to invest in traditional learning practices which increasingly show to be ineffective.
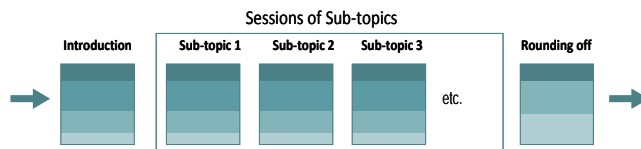
Microtraining. Microtraining is a mechanism to support informal learning with the learning demand of the worker as the main point of reference. This mechanism is based on a development scheme to organize self learning or group learning, to develop learning materials, e-learning and other learning activities, while focusing on the applicability of what is learned and needed in the workplace [13]. It supports the development of short, customized learning sessions for different groups of employees with the focus on workplace related learning demands (see figure 3). It is in fact a framework for types of self promoted learning support to be used by the employee or manager with a high level of practical relevance.

A Microtraining arrangement comprises a time span of 15-20 minutes for each learning occasion, which can activate and maintain learning processes for a longer period if they are bundled up in series, being face-to-face, online or in an e-learning situation. Each session starts actively, followed by a demonstration or exercise, feedback or short discussion, and ends with directions for further development and a brief preview of the next sessions.

Each **Microtraining session** is structured in the same way

3 min	Active start
6 min	Demo/Exercise
4 min	Feedback/ Discussion
3 min	What next? How to retain?

Each **series of sessions** is structured in the same way

Sessions of Sub-topics

Introduction	Sub-topic 1	Sub-topic 2	Sub-topic 3		Rounding off
				etc.	

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Fig. 3. The Microtraining Workflow [14]

'The Strength of weak Ties' [15] Granovetter [15] clarifies in his theory that weak ties (see figure 4) play an important role in the functioning of social networks and should be used to optimize the links between employees in an organization. Nowadays this theory again receives much attention in relation to the emerging use of social software. This discussion is relevant as the use of mobile devices, laptops and internet related applications like email and social software like You tube and Facebook or just a blog, enable the weak links (drivers) to be better informed and have more opportunities to communicate, which can strengthen the social network of the company.

weak tie

strong tie

absent tie
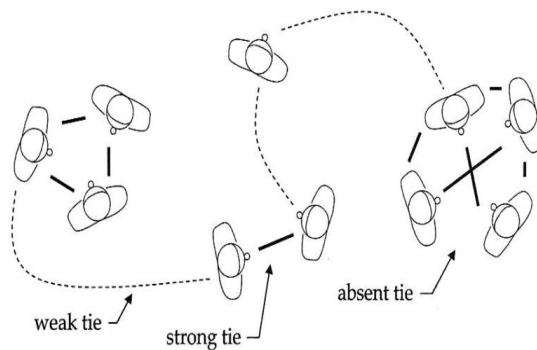
Fig. 4. A Social Network of Strong and Weak Ties [16]

Lorry drivers as mobile workers have a 'weak tie' with colleagues, unless they are friends. If so then they are part of a strong tie group that tends to become isolated if

they do not interact with 'weak ties'. In the context of a strong tie group, learning is not well served, because of the internally directed focus of the group.

3. Learning 2.0 Ingredients

The analysis of the actual and desired situation in the company clarified the need of an integrated information and learning strategy that comprise three dimensions as there are information; learning and performance. As a first step we matched theoretical concepts and visions with these requirements to establish a theoretical basis, which was used to develop solutions. Evident in the solutions approach is that learning comprises all interactions with information and as a consequence deals with the capacity of the employees to manage information in a meaningful way. The following section illustrates the main actions taken to integrate the different functionalities into a complete cross functional process. For phase 1 and 2 of the project, five work packages were defined: 1. Learning policy, 2. Communications Requirements, 3. Online Newsletter, 4. Micro Training and 5. Online courses. Each of the items is discussed below.

Integration of learning policy in strategic business plans. In the initial phase consensus was achieved with management about the importance of learning and the need to make this an integral part of the company's strategic business plan. The learning chapter should provide the link between the business plan and the curriculum. This learning plan should contain the vision, the approach and tools for the business plan as prepared for the holding and the different companies, the departments, the job positions and the related tasks. In the framework of this work package basic job profiles and annual job profiles were developed. The basic profile comprises the minimum knowledge, skills and experience levels. The annual profiles relate to instant changes in work practices and depending on the needs and the time period, these are added to the basic profile.

Communications Requirements. In the initial phase of the project the existing information resources were complemented through interviews and a survey focusing on the communications needs of employees and management. The aim of the study was to determine what the perception was of the employees and their wishes. The survey was distributed among all employees with a reaction level of 65%. In addition a selection of 13 employees were interviewed, taking into account age, group representation (drivers, planners, administration, management) or department, talkative or not, men and women, ICT minded or not. From the interviews and survey it is shown that the employees have a strong commitment towards the company. Generally there is a strong need for news about the business (state of affairs) with the emphasis on reliable and inclusive information. Especially the drivers are in need of good professional information. Their main sources of information are colleagues (85%). The monthly paper newsletter was considered an important good quality resource. Online information had not arrived yet as an alternative. To foster understanding of the situation a workshop was held with the management team on the

outcome of the surveys and interviews to clarify the views on the role of communications in and for the business. Managers underlined that communication should be open, honest and inspiring, respectful, interactive and available for everyone, requiring good solutions for 2-way communication, communication rules, clear (communication) tasks, responsibilities, sufficient support and commitment throughout the organization.

Online newsletter as the main entry for the Business portal. Since the paper newsletter was highly appreciated, it was decided to extend this tool to an electronic online newsletter and pilot this product over a period of time. The aim of the pilot was to find out which functionalities were needed to establish such a 24/7 news service. An online version requires a different strategy concerning content selection, production process, format, design, navigation, storage, and offers other features, such as the comments, which can be used and read by everyone. In that context it was important to establish a workflow for the online newsletter and analyze the work processes involved to assure that this service could in the long term be managed by the company itself. In addition, the technical infrastructure had to be designed and adapted to the actual ICT infrastructure. The Drupal content management system was selected because this open source software was a better fit for the company's demands for tailor made solutions within the margins of available skills and budget.

Microtraining. The managers were trained in the use of Microtraining. In a series of four workshops we dealt with the topics: 1. The need for well trained and informed staff, 2. Microtraining methodology, 3. Microtraining development, 4. Online course production based on the Microtraining concept. In this way the managers became familiar with the methodology and gained experience in using Microtraining through a group assignment of developing the content for an online module based on existing learning demands.

Online courses. The opportunities for mobile workers to attend place and time fixed learning events like courses are extremely limited. E-learning helps to make learning less place and time dependent. In the pilot phase learning by means of an online course has been examined using a course on the Digital Tachograph. The performance risks for drivers and company are high, since the introduction of this device is related to lots of implementation problems. The existing analogue equipment is gradually replaced by a digital version. The Microtraining concept was the basis for the development of this course, which consists of a series of learning events that could be used by the drivers online at any time or place.

4. Key Experiences

The project is moving from phase two to three as presented by the CLS-model [3] and data are being collected at the time of writing. Nevertheless we want to present some key experiences in the project up till now. The integration of redesigned information and learning policy in the strategic business plans has moved forward and

basic-profiles are now used to assess performance. The ongoing evaluation of the basic tasks and the required tasks show that employees are in continuous need for new information, new learning and new skills and in this framework personal development plans are being prepared. Experiences with the personal profiles so far, show that communication with and among the employees are of great importance to pass on the changes that are taking place. The electronic newsletter allows conveying the message in the right context and evoking public interaction.

The online newsletter (see figure 5) started with a minimum of functionalities to allow for tracking the impact of the intervention. At the same time the workflow of newsletter production was developed for the people formerly responsible for the paper version. At the moment an editor is responsible for the content and first line technical support. The editor, employees and managers all contribute to the news flow by sending in messages, links, reports, pictures, mobile phone video clips, etc. All this information is being tagged that allows for easy access to topic related information, which could also be learning related content like a course, the drivers handbook, legal documents and others.
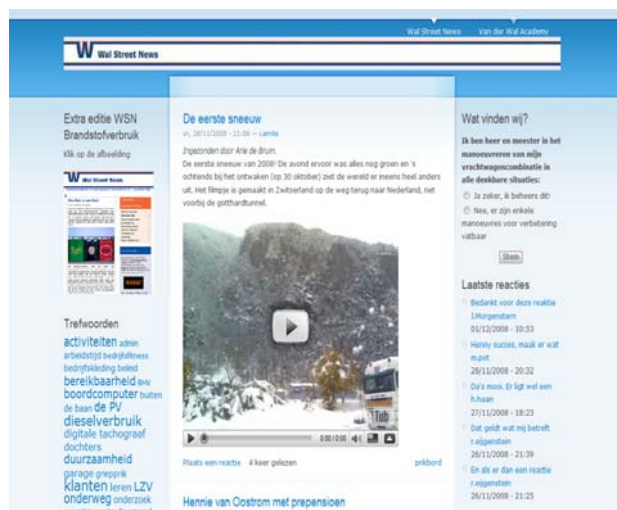
Fig. 5. The Homepage of the Business portal

Since news attracts most users, the homepage of the online newsletter is qualified as the main entrance for the business portal. The portal shows a multi dimensional approach reflecting the integration strategy of information and learning in the business processes. Employees were asked about their appreciation of the new system. The research shows that the drivers greatly appreciate the new online newsletter. Nevertheless there is still a large group that has difficulties with online information acquisition. This group is yet facilitated by the paper version of the newsletter, but this will come to an end. An ongoing activity is the further integration of the online newsletter (news portal) into the working practices. Reports on current

diesel prices, pump instructions and so on should encourage people to use the system. Other incentives are the option for each employee to develop an online profile. This concept should allow for better use of the connections with the weak tie colleagues and strengthen the company's network.

As mentioned before, the online course on the Digital Tachograph (see figure 6), as a first product, was based on the Microtraining concept. The course was developed in close collaboration with the end users. A preliminary classification of subjects was used by the fleet manager and drivers to determine their needs and express their wishes. The content then was collaboratively developed and tested by the users. The course is online and frequently being used. A first test and survey revealed that the users liked the online opportunity, had virtually no difficulties with the navigation in the course, considered the information as informative and useful, but were confronted with the 'lonely learner experience' as being very different from what they were used to.

Fig. 6. The Homepage of the Tachograph Course

The holistic and multi dimensional approach in the project is a complicating factor, because of the number of interdependencies. Although the CLS model helps to manage the complexity, the day to day business reality is a rather unpredictable factor that influences the pace and the planning in the project. Urgent needs receive much more attention than planned for and other interventions have to be delayed. This is a reality test for the project and is a crucial element in the integration with the existing business processes as part of the new learning strategy. The online newsletter or business portal, as some call it, continues to be the central point for access to the news, business resources, learning environment, personal profiles and workshops (communities) that start developing around topics such as the Digital Tachometer. Key words (tags) are the main links between these various components and lower the threshold for the user to acquire any information, including the access to learning related resources offered in the business context. The most important next step is the

emerging integration with the daily working practices that should coincide with the emerging acceptance of this new approach.

Some interesting numbers come from the comparison of the analysis of the target group at the beginning of the project at the end of 2007 with the state of affairs at the end of 2009 after the business portal was successively introduced during 2008. In 2007 the employees were not very satisfied with the communication in the company, especially not with the way management conveyed their information. The business portal apparently has a positive effect on the perception of the employees concerning the communication. The employees express that they receive more information on the topics they consider relevant, like about their work, business results, customer satisfaction, management information and human resource information. Also they consider this information to be more relevant than before. In 2007 32% of the employees indicated that they received information from management on a regular basis. By the end of 2009 this had risen to 76% and they considered this information more relevant, 39% – 54%.

An important issue was when, how often and from where the employees were using the portal. This is relevant to judge if the portal serves as low threshold information and learning resource at all times. It's 37% of the employees that uses the portal daily and 27% weekly. On a two week basis it is 84% that uses the portal. 56% use an office pc to log on, 46% a home pc and 19% use mobile computers and other devices. 46% of the employees use during working days, 41% uses it in the weekend.

5. Conclusions

The reengineered information and learning strategy as an integrated service has been rewarded by management and employees of the transport company as a business process for innovation. Change though takes time especially when change of behavior is part of the innovation. Some employees think the development does not go fast enough, which is an indication for the emerging momentum in the development which should be addressed and used to better manage the expectations. The news portal is up and running and is used more and more by the employees, which shows the increasing integration of the service in the daily work processes.

The role of managers in this development needs to be strengthened. It remains difficult for them to maintain an overview of the new methodologies and materials and to actively work on the integration with their tight agenda. Manager involvement should carefully be planned. The results so far increase the demand and therefore it is necessary to agree on the pace and scope, so expectations stay in line with the possibilities. The managers are generally satisfied with the more flexible training options and start using the Microtraining concept of short focused sessions also in their group meetings. The Microtraining method is perceived as clear and logical. For the overall acceptance of the innovation, this is a promising development also because regular use will foster other applications. The use of the theoretical concepts and visions as a development framework plays an important role in discussions on choices to be made regarding the feature development of the learning strategy. On virtually

any level of development, these concepts supply guidance which is very helpful to transfer the main ideas.

Two items seem to be crucial. A holistic approach is not only useful to get a good overview, but provides a better insight in the business processes, the opportunities and barriers and the relevance of the redesign. This project is not just about the introduction of some information management and e-learning applications, but about the development of a sustainable learning strategy that builds on the qualifications of the worker population. The second item is involvement. The needs and wishes of management and employees are at the core of what this strategy is about. If it fits their needs, they will use it and start depending on it.

The numbers of the user evaluation show very positive results in regard to the objectives of this project. Reengineering the learning strategy has shown so far to be useful and rewarding as a cross-functional process.

6. References

1. De Vries, P.: An Analysis Framework Approach for Managing Corporate E-learning Development. Brussels: De Vries. Doctoral dissertation. (2005)
2. De Vries, P. & Leege. T.: Final Report WP 1: Baumaerkte und Lernen: eine Bedarfsanalyse. Reload project. DE/07/LLP-LdV/TOI/147058. Leonardo Project European Union, (2008)
3. De Vries, P. & Lukosch, H.: Supporting Informal Learning at the Workplace. In: IJAC, International Journal of Advanced Corporate Learning. Vol 2, No 3. August 2009. Pp. 39-44. www.i-jac.org (2009)
4. De Vries, P. & Brall, S.: Microtraining as a Support Mechanism for Informal Learning. In: Elearningpapers of Elearningeuropa, on: http://www.elearningpapers.eu/, (2008)
5. Vygotsky, L.S. Mind and society: The development of higher mental processes. Harvard University Press, Cambridge, MA (1978)
6. Wertsch, J.V. Vygotsky and the Formation of the Mind. Cambridge, MA (1997)
7. Siemens, G.: Connectivism: A Learning Theory for the Digital Age. International Journal of Instructional Technology and Distance Learning, Vol. 2, No. 1 (2005)
8. Siemens, G.: Knowing Knowledge. Lulu Publishers (www.lulu.com), (2006)
9. Jonassen, D., Mayes, T., & McAleese, R.: A manifesto for a constructivist approach to uses of technology in higher education. In T.M. Duffy, J. Lowyck, & D.H. Jonassen (Eds.), Designing Environments for Constructive Learning (pp. 231-247). Springer-Verlag, Heidelberg (1993)
10. Rosenberg, M.J. Beyond E-learning: Approaches and Technologies to enhance Organizational Knowledge, Learning and Performance. (2006).
11. Jonassen, D. H.: "Instructional Design Models for Well-Structured and Ill-Structured Problem-Solving Learning Outcomes". In: Educational Technology Research and Development 45 (1): 65-94 (1997)
12. Cross, J.: Informal Learning: Rediscovering the Natural Pathways that Inspire Innovation and Performance. Pfeiffer , San Francisco (2007)
13. De Vries, P.; Lukosch, H.: Supporting Informal Learning at the Workplace. In: IJAC, International Journal of Advanced Corporate Learning. Vol 2, No 3. Pp. 39-44. www.i-jac.org. (2009)
14. Overschie, M.: Microteaching Manual: Effective transfer of knowledge for Sustainable Technological Innovation. On http://www.microteaching.org (15.8.2008), (2007)
15. Granovetter, M. The Strength of Weak Ties: A Network Theory Revisited. In: Sociological Theory, Volume 1, p. 201-233 (1983)