



E-learning for Professionals – research report

Innovation adoption, implementation, pedagogy and other factors

Summary

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This report is the result of two related projects. The first project concerns information, education and training, especially web based training and education, for professionals in the domain of refrigeration and related areas. The project has been performed with funding from the Swedish Energy Agency (Energimyndigheten) and was led by Sveriges Energi- och Kylcentrum (SEK).

The second project concerns implementing municipal risk and vulnerability analysis with respect to information and education needs with a special focus on Geographic Information (GI) and Geographic Information Systems (GIS) supporting emergency management. The project has been conducted with funding from the Swedish Land Survey in the context of cooperation between central Swedish government authorities (SMHI, SGU, etc) regarding GIS and GIS for Emergency Management with funding from the Swedish Emergency Management Agency (SEMA).

The following main issues have been addressed in the project:

- experiences with web-based training
- financial aspects
- which type of pedagogy is used?
- what is successful and what is not successful?
- which tools and formats are used?

The theoretical framework for the project is based on previous cooperation between SEK and the researcher as well as a project performed for the Swedish Land Survey regarding the implementation of GI and GIS in the context of risk and vulnerability analysis. The theoretical framework has been used to design data collection by interview questionnaires, to process interview data, structure the literature, etc. In the theoretical framework, knowledge on diffusion of innovations in social systems, technical aspects of e-learning, implementation principles, development of knowledge and skills for professionals as well as pedagogy are addressed.

Regarding methodological issues interviews have been performed by telephone and by visiting respondents. We have had contacts with a great number of companies and organizations. We have obtained interesting information during these contacts, e.g., if web-based training and e-learning are not used and in some cases why. For example, Fortum has shift personnel that participate in shift groups in traditional education and training. The interview data have been processed in the Mind Mapping software MindManager. The selection of respondents has been performed by a criterion of relevance, selecting different sizes of organizations, different types of organizations, and if the respondents are willing to participate.

The main data in the report stem from the interviews with nineteen respondents. The respondents represent universities, suppliers, users, the Swedish Rescue Services Agency (SRSA) and SEMA.

Concerning web-based training and education it is a growing area in many professional groups according to many respondents. However, we have not reached a saturation point in the perspective

of diffusion of innovations. For example, KTH is a campus University. For small companies it can be convenient to meet each other in a small group for education and training. Financial aspects are very important. Pedagogy must be clearly designed regardless if the training is based on e-learning, traditional campus education and training or a combination of these. Pedagogical issues include that a course participant must be able to control his/her information navigation, continuous feedback, activity, sequencing, and communication. Regarding tools, the project has not been able to perform a deep analysis and evaluation. However, the circumstances, the discipline and many other factors influence the selection of functions and the design of tools. PDF and Microsoft Word files are used by almost everyone. Java is used primarily for engineering and science. Flash animations and courses with rich interactivity and multimedia are used by large companies and organizations that can recoup the high development costs on many users. Rapid e-learning is interesting since it is easy to use and a low cost option regarding development costs. For example, with rapid e-learning, lectures and lessons are easily recorded in Microsoft PowerPoint and exported to Flash with the help of Captivate, Camtasia and similar software products. Although video is mentioned by only a few respondents it can be useful in technical education and training since it is much cheaper compared to professional Flash productions. The respondent from Open Training on the other hand claims that interactive Flash productions can lead to very high learning values. It is also possible to adapt a lesson for each person if a professional and interactive multimedia product is used. If a course is aimed at several hundreds or thousands of course participants it can be cost-effective to invest in a professional multimedia product and save money when the course is implemented. Regarding communication, communication in real-time is not so important among the respondents. However, it is important that a supervisor or expert is available when needed. It can be difficult to navigate and find information in software and the Internet so it is useful if a course participant can call someone to get support and help. Communication that is not performed in real time includes discussion groups and messaging in Learning Management Systems (LMS). The researcher is using an LMS with discussion groups in the courses he participates in as faculty. The discussion groups facilitate communication and course administration, especially if there are many course participants and groups. E-mail is less effective even if it must be available. Regarding administrative functions these can be a great help to save time if the system is user-friendly. Also effective security routines and functions are important. Quizzes, different types of tests, and statistics are important. For example, courses where students can make diagnostic tests automatically and get automatic feedback can be effective.

Concerning competence development in rescue services and emergency management area, SEMA and SRSA have a service role. Therefore, they travel to professionals in different regions and municipalities, e.g., in Fire and Rescue Services and municipal administrations for information, education and training as well as network building. There is knowledge that is very dependent on the circumstances where you have to discuss and solve problems in groups. Therefore people have to meet. However, e-learning complements meetings in the same location. The project has not been able to investigate GI and GIS for Emergency Management with respect to e-learning extensively due to lack of respondents. However, a new project that concerns testing and evaluation of rapid e-learning in cooperation with the Swedish Land Survey will start shortly.