Workplace Computer–Supported Network–Based Learning

Joze Rugelj
University of Ljubljana, Slovenia

INTRODUCTION

In the new economy, companies require employees who are willing and able to continue learning. Workplace learning is the key factor and an essential element in the personal and professional development of employees. It is the main means by which they improve their work, and it is a key strategic element in achieving organizational objectives and goals, leading directly to enhanced competitive advantage.

Workplace learning takes place on the job and on the Web; it takes place at home, at conferences, in training facilities and through virtual corporate universities, to name a few. It is a process that can be as individual or as collaborative as the situation requires. Outcomes should be the development of the employee's knowledge, skills, values, attitudes and actions in relation to the workplace environment.

Learning technology solutions have the power to integrate the process of work and learning to improve knowledge and, hence, job competence and performance. Working then becomes an integration of learning and performing, facilitated by a discipline-specific technology that adapts to the uniqueness of the individual using it. Learning technologies are not only about delivering education, learning or training electronically. The field of learning technologies is a multidisciplinary one that includes learning theory and instructional design, training, distance education, information communication, cognitive science, performance improvement, process and quality improvement, knowledge management, electronic performance support and human resources.

Learning and training delivery solutions combine a variety of appropriate low- to high-end technologies with an assortment of suitable instructional designs and theories. The objective is to aid, improve or complement a person's learning experience. Learning technologies have been and still are anything from a video to a drill and practice computer tutorial, to a sophisticated business simulation or knowledge management tool. In the past, learning technology solutions included laser discs, audio, computer projection, video conferencing. Today, they include these devices but also extend to highly interactive, networked learning modules that are available to the desktop. Learning technologies include information retrieval systems, productivity and communication tools, and cognitive tools for just-in-time learning, such as electronic performance support.

Today's networking technologies help to turn work environments into open systems, where the sharing and accessing of expertise and knowledge is commonplace (Osgoode, 2000). Under these circumstances, individual employees are responsible for driving their own learning and do not have to wait until the next time a course they require becomes available. The course is available any time they need it, as many times as they need it. If this system works, individuals can learn faster, allowing organisations to learn more quickly.

ONLINE LEARNING ENVIRONMENT

Traditional arguments for in-class training vs. technology-based online learning have included the immediate availability of an instructor for the students, and the higher status that formal certificates have when delivered through classroom training. Until recently, these pro's on the classroom side have addressed weaknesses on the technology side. With improvements in technology, these weaknesses are disappearing. Computer-based training weaknesses often include that there is no expert on hand and that it is difficult to design a product that can handle all questions well. With the emergence of Web-based

synchronous and asynchronous learning tools, facilitation of learning content delivered through a computer is improving.

In spite of these improvements, there are still some obstacles that diminish success of online learning in practice or at least limit its wider acceptance. In many less-developed countries, users still face a lack of networking opportunities, and so-called computer illiteracy is still a problem, especially for older generations. Isolation problems of individual learners and, consequently, certain loss of motivation due to limited stimulation and reinforcement, are the result of limited interaction foreseen in the design of learning environment or users' uneasiness with computer-supported communication.

A generic model for an online learning environment consists of two basic building blocks: a virtual textbook (learning resources) and a virtual classroom, which consists of virtual community and management tools (Levy, 2003). These components are bound together with open learning theory (Rugelj, 1999; Rosbottom, Crellin, Fysh, 2000).

Virtual Textbook

Virtual multimedia textbooks are a collection of learning materials with some additional functionalities, such as interactive computer-supported examination and access to dynamically changing information resources.

Special attention needs to be paid to preparation of courseware. It can be supported to a great extent by different tools that can help in appropriate organization and structuring of course materials and can simplify graphical design of courseware. Course materials are available on the Internet for online access, or on CD-ROMs for those who do not have permanent access to the Internet. Learning materials are thus gathered in more or less virtual multimedia textbooks. They can be a high-quality supplement to existing learning materials or, in some cases, an adequate substitute for ordinary textbooks (Rugelj, 1997).

To take advantage of the popularity of the WWW and its browsers as well as other helper applications (e.g., plug-ins, viewers, players, etc.), a research group from the faculty of education of the University of Ljubljana in collaboration with J. Stefan Institute designed a learning environment based on the WWW technology (Rugelj, 2001). This approach provides a single unified interface for all system components and their operations. Learners use a WWW browser as a front-end interface to access learning materials. Course materials include not only static components such as text and images, but also active components such as URL links and Java applets.

In many cases, virtual multimedia textbooks can, due to their flexibility and interactivity, offer some innovative solutions. One of the important extensions of the virtual textbook is software for computerizing tests and exams. Using such a tool, the lecturer or author of course learning materials enters questions on the study topic into the computer, and people take the test sitting in front of their personal computer. Examinations can be taken after the course is finished to verify the results of education, or during the course as a self-assessment tool that can be used to improve efficiency of educational process. The computer then marks the answers, can give instant feedback and stores the answers for the lecturer's analysis.

Virtual Classroom

According to constructivist learning theories (Lefoe, 1998; Fosnot, 1996), the emphasis in technology-based education should change from information transmission to knowledge construction; from individual to collaborative learning; from separate, non-reusable teaching tools to integrated and adaptable technologies; and from distance as an obstacle to distance as an asset, favouring lifelong learning.

Due to the above-mentioned needs for collaboration, a network-based learning environment requires some tools for computer-supported communication that allow students and lecturers to interact asynchronously and synchronously. A virtual classroom is a set of tools for collaboration and communication support that allows collaboration between all participants in the educational process (i.e., lecturers, tutors, learners) and gives them an impression of learning in a community. Asynchronous forms include more traditional tools like e-mail and newsgroups, while synchronous communication tools comprise video and audio desktop conferencing systems, shared whiteboards and synchronous text-based conferencing tools. Several WWW-based tools for cooperative information sharing have been

6 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/workplace-computer-supported-network-based/12392

Related Content

Problem-Based Learning in a Technical Course in Computing: A Case Study
Eduardo Correiaand Ricky Watson (2010). *International Journal of Information and Communication Technology Education (pp. 13-22).*
www.irma-international.org/article/problem-based-learning-technical-course/47018

Modelling the Utilization of Digital Technology in Education During the COVID-19 Pandemic Through an Expert-Based Analytic Tool
Celbert M. Himang, Rosendo Cernias III, Ronnel Uraga Corbes, Mary Joy Modina Alicer, Benjie Colobong, Joy M. Olarte, Lanndon Ocampo, Miriam Fabroa Bongoand Rosein Ancheta Jr. (2023). *International Journal of Information and Communication Technology Education (pp. 1-23).*
www.irma-international.org/article/modelling-the-utilization-of-digital-technology-in-education-during-the-covid-19-pandemic-through-an-expert-based-analytic-tool/332863

A Case Study of Ontology-Driven Development of Intelligent Educational Systems
Gordon Deline, Fuhua Lin, Dunwei Wen, Dragan Gaševicand Kinshuk (2011). *Dynamic Advancements in Teaching and Learning Based Technologies: New Concepts (pp. 79-94).*
www.irma-international.org/chapter/case-study-ontology-driven-development/49298

21st Century E-Student Services
Gary R. Langer (2009). *Encyclopedia of Distance Learning, Second Edition (pp. 2160-2167).*
www.irma-international.org/chapter/21st-century-student-services/12046

A Model for an Adaptive e-Learning Hypermedia System
Lamia Mahnane, Laskri Mohamed Tayeband Philippe Trigano (2013). *International Journal of Information and Communication Technology Education (pp. 21-39).*
www.irma-international.org/article/a-model-for-an-adaptive-e-learning-hypermedia-system/99627