Just-in-Time Training (JITT) and its Implications for Teaching and Learning

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INTRODUCTION

You are in a heated discussion with friends about the meaning and origin of a particular phrase. Someone uses his wireless computer to access the Internet and "googles" the debated phrase. The dispute is resolved in seconds. You attend a conference in a new city and get lost on the way to the convention center. Turning on your GPS system in your rental car, you are then guided by a soft, calming voice with explicit instructions to your destination, including warnings of upcoming turns as well as detours around any recent road construction. This "just-in-time" information is available to us through the advancements in technology. With the constant evolution of new technology as well as the increased speed of information retrieval, we often take for granted the "just-in-time" aspect of this process.

Just-in-time training, or preferably just-in-time learning, has altered the training and preparation of workers in industry, and currently has educational implications in all fields. The technological advances have made it possible to match specific knowledge and skills with the worker or learner, literally, when and where they need it. An example from industry is the worker whose line shuts down because of a mechanical problem. Within seconds, she/he is consulting with someone half way around the world who already has all the technical data about the system breakdown on his/her computer. A few seconds later through live video, he/she demonstrates to the worker how to fix the problem.

Industry no longer expects public education to teach technical skills. The speed of technological advances would make it impossible and financially unwieldy to stay current with equipment and training. They also do not wish to invest a lot of money in pretraining their workers. Pretraining does not guarantee that the worker will have or be able to access the knowledge and skills when confronted 9 months later with an on-the-job problem-solving event or stay current with the ever-changing technology. The best of training or learning comes "just in time."

BACKGROUND

The expression "just-in-time" (JIT) was used initially in industry related to the application of production-inventory and customer response. The technology and software available improved the ordering process and thus increased productivity and eliminated waste. Using the "just-in-time" application significantly reduced inventory costs for the company, while improving response time for customers.

The concept of "just-in-time" was then applied to training in industry and referred to as just-in-time training or JITT. The expanding training needs of the workplace have made JITT a major part of the human resource development departments of companies. JIT learning was not invented by "workplace educators and performance specialists within the human resource development field, but rather it (was) conceptualized as an evolutionary response to the demands of a knowledge-driven and speed-oriented market place" (Bradenburg & Ellinger, 2003, p 311). Horton (2000) provides guidance in designing Web-based training. The author refers to the exploding demand for training in technical knowledge needed for trained technology workers and how Web-based training is suited to meet this need. "Just-in-time learning systems deliver training to workers when and where they need it. Rather than sitting through hours of traditional classroom training, users can tap into Web-based tutorials, interactive CD-ROMs and other tools to zero in on just the information they need to solve problems, perform specific tasks or quickly update their skills" (Sambataro, 2000, p. 50).

The "just-in-time" concept has recently been expanded to a more general application in the human resources departments of corporations. JITT, and the expanded use of technology resources, has provided a

framework for more effective and efficient training and staff development of workers, as well as classroom, face-to-face alternatives for course work in higher education. While having roots in industry, just-in-time-training and learning evolved from many factors. Bradenburg and Ellinger (2003) identifies other subtrends that contributed to the expansion of the JIT training and learning concept. He noted that the move toward "the virtual workplace, the growth of knowledge capital, and the increasing rate of change all became factors in the JITT movement" (p. 304). The expansion of JITT and learning did not stop at the worker/learner level, but was also applied to customer-based initiatives, as well. Sambataro (2000) provides the example of Schwab & Company applying the "just-in-time" concept for free investment education for prospective and existing customers in order to address concerns and fears over investment issues quickly and effectively.

Application of JITT

JITT has been applied in the fields of medicine, technology, and the United States Armed Forces. For example, JITT has been applied to technology training. Kutzik (2005) discusses the distinction between training that is ongoing and training that is justin-time. The author describes the need for ongoing technology training as components created to provide training for new or transferred employees. These training modules are considered "off-the-shelf sessions and are often delivered one-on-one (trainer to employee) or taught in small classes scheduled frequently through the year" (p 8). Materials for this continuous, basic training are developed and updated regularly. In contrast, just-in-time technology training is "mandated by an emerging situation" (p. 8). Here, simulated and interactive tutorials are provided online or burned to disk. The author concludes that "although the use of presentation and simulation software tutorials can be of great assistance in learning new technology, the time demands of just-in-time training make creating these resources problematic" (Kutzik, 2005, p.10).

The U.S. Navy has added JITT to its training programs. Harris (2005) describes a report of increased knowledge of material and significant behavior change in Navy personnel as a result of an online, interactive course in leadership (p. 45). "Part of the mission of its four-year-old Revolution in Training initiative is to integrate the Navy's manpower, personnel and training

organizations into a single information-rich human resource management system" (p. 45). "The plans will also reflect just-in-time training priorities, so sailors learn only what they need to, precisely when then need it" (p. 45). The author points out that in contrast to the past, the U.S. Navy's "new open source architecture makes skills-related information widely available" (p 45). In addition, the Navy training program has linked specific competencies with training. Training is designed for the individual. Given a sailor with certain skills in an occupation, the training program focuses on the missing skills and the individual receives training on only what is needed rather than the one-size-fits all mentality of a comprehensive program (Harris, 2005, p. 46).

The Navy demonstrated the importance of a systems approach when incorporating JITT into its programs:

The Navy was discovering that the traditional way to 'treat' problems had been to focus only on the individual, and the usual answer was more training. The assumption was that poor performance was simply a result of poor knowledge or skill that could be easily fixed by sending the sailor back to school. In fact, more training historically solves the problem less than 20 percent of the time. Other contributors to poor performance relate to processes, incentives, tools and equipment, manpower and clarity of goals. (Harris, 2005 p. 47)

Trotter (2007) found JITT an effective method for the diagnosis and repair of mechanical problems. The author identified the need for organizations to link Web-based strategies with on-demand availability, just-in-time requirements, and on-the job needs. Again, learning and retention were increased with the application of multimedia resources as 3-D visuals, animation, and interactivity. The author describes Scorm (Sharable content object reference model) guidelines defined by the Department of Defense. These guidelines assure JITT instructional materials are created and shared throughout the branches of service, saving time and money. Leach and Haun (2003) describe the use of JITT in the medical field. The authors point out that learning takes place when adults are motivated by a need for information. Their study demonstrated the quality of learning that takes place when instruction is matched to the needs of the learner, as well as the use of pictures and color in transmitting information.

A different form of just-in-time training for classroom teachers sans computer is a form of peer coach-

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