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Incorporating Collaborative Technologies Into the Pedagogy of Instructor-Led Training

CAPSTONE REPORT

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Abstract

This annotated bibliography examines literature published between 2008 and 2014 as they address collaborative technologies and how these technologies may be combined with formal learning approaches to maximize learning outcomes. It provides information to corporate trainers and instructors of adult professionals about: (a) collaborative technologies, (b) formal learning and informal learning, and (c) learner satisfaction, learner motivation, and the transfer of learning.

Keywords: adult learning, collaborative tools, instructor-led, formal learning, behavior change, learning outcomes, collaborative learning, learning experience, corporate training, Web 2.0, and blended learning.

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Introduction to the Annotated Bibliography

Problem

Within the last several years, organizations have implemented collaborative technologies with the hopes of increasing production, innovation and collaboration among employees (Morgan, 2012). Collaborative technologies, also known as Web 2.0 technologies, come in a variety of forms such as: wikis, blogs, discussion forums, and social networking (Amitabh & Sinha, 2012; LeNoue, Hall, & Eighmy, 2011; London & Hall, 2011). These technologies can be described as providing an architecture of participation, which facilitates ease of usage and the valuing of each user's contribution (Cheung & Vogel, 2013).

These types of group processes are categorized as supportive of informal learning, where learning takes place in a dialectical and ongoing process and is acquired through collaboration, mutual problem-solving and the sharing of experience (Zhao & Kemp, 2013). In today's organizations, a majority of the learning takes place informally (Amitabh & Sinha, 2012). Informal learning that utilizes collaborative technologies is often referred to as social learning. Social learning is defined as, "the interaction between two or more people utilizing social media and/or other collaborative technologies to facilitate exchanges in knowledge acquisition" (van Dam, 2012).

Formal learning on the other hand is usually acquired through institutionalized workplace training programs, is structured, and is instructor-led (Ambrose & Ogilvie, 2010; Choi & Jacobs, 2011; Zhao & Kemp, 2013).

Formal learning comprises planned events or experiences that are designed to prepare individuals to attain a specific set of knowledge and skills. Learners are separated from

> their day-to-day work to participate in lectures, discussions, and other instructional activities that are planned and structured. (Choi & Jacobs, 2011, p. 241)

According to Lee and Bonk (2014), organizations are beginning to realize that formal learning is "…no longer sufficient…" (p. 10) and that adult learners "…prefer to learn through collaborating with other people who have more hands-on experiences at work rather learn from classroom instructors" (p. 10). In formal learning, "the learner plays a passive role as the receiver of information, and learning occurs to the extent that the appropriate conditions are provided by the learning 'experts' or are inherent in the learning method" (Noe, Tews, & Dachner, 2010).

Amitabh and Sinha (2012) state, "traditional training has typically focused on the design, delivery and management of structured learning programs. However, the modern learning framework pertains to providing learning environments that support formal-informal knowledge creation and sharing environments" (p. 12). Recent findings suggest that the integration of formal and informal learning will maximize the benefits of the overall training (Choi & Jacobs, 2011).

One desired benefit of training is learner satisfaction. Gunawardena, Linder-VanBerschot, LaPointe, and Rao (2010) define learner satisfaction as the learner's perception that the course was a beneficial experience. Research on collaborative technologies indicates that these technologies enable learners to focus on what they believe they need to know to achieve particular outcomes (London & Hall, 2011), thus improving learner satisfaction (Gunawardena et al., 2010). In addition, research indicates that learning professionals can leverage these technologies to branch into new areas of knowledge and offer ways to seek and

reflect on feedback from multiple sources (London & Hall, 2011), thus improving learning outcomes by enabling learners to learn from and share, participate, interact, and create with each other (Zhao & Kemp, 2013). Collaborative technologies hold promise for improving the learning experience for students and the overall effectiveness of training.

Purpose

As organizations continue to place value on instructor-led training while investing in new collaborative technologies, how might these two forms of learning intersect to have a positive impact on students' learning experiences (Gradel & Edson, 2012)? Kim, Bonk, and Oh (2008) posit the blending of instructor-led training with collaborative technologies results in improved pedagogy by taking advantage of both formal and informal learning.

The purpose of this annotated bibliography is to identify literature that examines collaborative technologies and provides techniques for incorporating these technologies into the pedagogy of an instructor-led training for adults in a professional setting. Research on formal learning and informal learning is included to provide context for the blending of the new collaboration technologies and approaches with more traditional instructor-led practices. According to Chen and Bryer (2012), use of collaborative technologies as learning tools could bridge the gap between informal learning and formal learning. Additional sources are included that explore learner satisfaction and transfer of learning as means of providing information on how to gauge the effectiveness of various learning processes. Finally, research sources for collaborative technologies and their use provide options for instructors and other training professionals who wish to incorporate new technologies and techniques in their practices.

Research question

How can collaborative technologies be incorporated into the pedagogy of an instructor-led course for professional adults to maximize learning outcomes (London & Hall, 2011)?

Audience

According to London and Hall (2011), "the role of the learning professional is changing from designer and controller to facilitator and guide" (p. 757). Today's learning professional faces new challenges such as a multi-generational workforce, remote workers, and learners who expect to be active participants in their learning (Ambrose & Ogilvie, 2010). Understanding the advantages of incorporating collaborative software into instructor-led classes holds the potential for widespread benefit for instructors focused on adult education. The use of collaborative technologies is believed to help learners organize, integrate, summarize, and interpret data by enabling instructors to customize learning to suit the individual or group (London & Hall, 2011). Research indicates that these collaborative tools facilitate both engagement and learning outcomes of students in instructor-led training (Gradel & Edson, 2012). The primary audience for this study is, therefore, instructors of adults in a professional setting.

Search Report

Data collection. Initial searches of the literature are conducted in the following areas: (a) collaborative technology; (b) formal learning/informal learning; and (c) learner satisfaction/transfer of learning (Gunawardena et al., 2010). Data in the form of published articles is collected using the University of Oregon library online databases. References meeting the following criteria are given priority:

- Published in an academic, peer-reviewed journal;
- Published between 2008-2014;
- Available online first, with consideration for particularly relevant sources that may require hard copy.

Reference evaluation criteria. References are evaluated using a set of criteria provided by Bell and Frantz (2013) in an article titled *Critical Evaluation of Information Sources*, located on the University of Oregon Libraries website. The following key criteria are reviewed and analyzed for each article included in the annotated bibliography:

- Authority – focus is on peer-reviewed journals and professional credentials;
- Objectivity – works are reviewed for bias by providing more than one view on an issue and for where arguments and/or conclusions are supported by evidence;
- Quality – works are reviewed for proper grammar, spelling and/or typographical errors;
- Currency – literature with collaborative technologies as the main subject is limited to publication dates between 2008-2014 due to the rapid pace of change in these technologies;
- Relevancy – literature that addresses one or more of the key areas of: collaborative technologies, formal learning/informal learning, and learner satisfaction/transfer of learning. In addition, articles that are scholarly are selected over popular sources and those where the publishers are of scholarly, professional organizations or academic press, are given preference.

Search strategy. Keywords used are: *adult learning, collaborative tools, instructor-led, formal learning, behavior change, learning outcomes, collaborative learning, learning experience, corporate training, Web 2.0,* and *blended learning*. Searches are limited to the Business and Education subject categories within the Articles & Databases search tool, with the majority of references located in ERIC (Education Resources Information Center) and Business Source Complete. Additional references are located by reviewing the bibliographies of relevant sources for relevant citations and selecting relevant sources from the author's personal library.

Documentation approach. References are documented and tracked in two ways. The first method is provided by the online University of Oregon Library. The library system provides methods for saving articles with user-generated keywords. This provides a method for cataloging identified references with the labels of collaborative technology, formal/informal learning, and learner satisfaction, learner motivation and transfer of learning. Full text copy references are saved as PDF files with key information highlighted using the Adobe Reader highlighter tool. The second method uses an Excel spreadsheet to capture and track additional article information: keyword searches, database location, abstract, and citation information. The Excel spreadsheet is saved locally and in a cloud-based storage program to protect against data loss.

Annotated Bibliography

The 15 references selected for the following Annotated Bibliography are organized in three categories. Each category addresses elements related to this study's research question: How can collaborative technologies be incorporated into the pedagogy of an instructor-led course for professional adults to maximize learning outcomes (London & Hall, 2011)? The first category contains references that explore the various collaborative technologies and techniques for incorporating these technologies into the pedagogy of an instructor-led training. The second category contains references that provide context for the blending of the new collaboration technologies and informal learning approaches with more traditional/formal instructor-led practices. The third category contains references that explore learner satisfaction and motivation as measures of the effectiveness of different learning approaches and the transfer of learning as a means of gauging the effectiveness of various learning processes. Each annotation consists of three elements: (a) the full bibliographic citation, (b) an abstract, and (c) a summary. The abstracts are either complete as published, or are modified versions of the published abstracts for content relevance. The summaries draw upon the content within each article that addresses the research question.

Collaborative Technology

Amitabh, A., & Sinha, S. (2012). The learning continuum f8ormal and informal learning experiences - enabling learning and creation of new knowledge in an organization. *International Journal of Advanced Corporate Learning*, *5*(2), 10-14. doi:10.3991/ijac.v5i2.2111. Retrieved from

http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=bth&AN=76422894&site=ehost-live

Abstract. Over the years, there has been a significant shift in the approach towards 'learning' in an organization. The focus of learning is no more limited to only the formal training mediums, such as classroom interventions and elearning programs. The shift in learning paradigm is more towards the creation of new learning solution that provides formal and informal learning, information and collaboration - thereby enabling the formation of a 'personal learning environment.' Now, there is a shift from 'content focus' to 'learner focus' education. This paper will suggest the appropriate use of technologies and processes to create a rich learning environment that includes a broad array of instructions, information resources, and collaborative solutions.

Summary. This article by Amitabh and Sinha explores the three stages of an organization's learning maturity: (a) Stage 1: initial e-learning, (b) Stage 2: multi-modal and integrated learning, and (c) Stage 3: informal, collaborative learning and performance support. The authors posit that mature learning organizations provide students with blended learning opportunities with an emphasis on informal knowledge sharing and collaboration through the use of collaborative technologies, thus satisfying one key focus of this research study by identifying and applying specific collaborative technologies to adult learning in the workplace. Collaborative technologies cited by the authors include webinars, video, discussion forums, and social networking. The authors posit that the most appropriate learning solution for adults in the workplace is a blend of formal learning and informal learning, including the use of collaborative technologies.

Cheung, R., Vogel, D. (2013). Predicting user acceptance of collaborative technologies: An extension of the technology acceptance model for e-learning. *Computers & Education*, *63*, 160-175. doi: 10.1016/j.compedu.2012.12.003

Abstract. In this study, we enhance the technology acceptance model to explain the factors that influence the acceptance of Google Applications for collaborative learning. According to the research results, determinants of the technology acceptance model are the major factors influencing the adoption of the technology. The ability to share information in the collaborative learning environment is found to influence intention and behavior toward the Google Applications platform.

Summary. This article focuses on student perceptions and factors that affect the student's acceptance of collaborative technologies, thus satisfying one key focus of this research study by identifying student acceptance factors of collaborative technologies for use in training delivery. The collaborative technologies examined in this study consist of Google Applications including Google Docs, discussion forums, share spaces, and Google Forms. Based on qualitative data gathered from 136 students survey responses, the authors conclude that the adoption of collaborative technologies by students is strongly influenced by their peers, as students may feel obligated to use the collaborative technologies when they are part of a group. In addition, the perceived ease of use of the collaborative tools also strongly influences their adoption; however, the instructor has little to no direct influence on the adoption of the tools.

Gradel, K., & Edson, A. J. (2012). Integrating cloud-based strategies and tools in face-to-face training sessions to increase the impact of professional development. *Journal of*

Educational Technology Systems, 40(2), 113-130. Retrieved from EBSCO database http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=eric&AN=EJ956003&login.asp&site=ehost-live&scope=site

Abstract. This article is based on the premise that face-to-face training can be augmented with cloud-based technology tools, to potentially extend viable training supports as higher education staff and faculty implement new content/skills in their jobs and classrooms. There are significant benefits to harnessing cloud-based tools that can facilitate both engagement and learning outcomes of trainees in face-to-face opportunities. After reviewing solutions, an integrated picture of their use is presented, followed by implementation recommendations.

Summary. This article focuses on the use of collaborative technologies in preparing and implementing adult learning, thus satisfying one key focus of this research study by identifying strategies for implementing collaborative technologies for use in adult training. The authors explore two solution sets of collaborative technologies: (a) tools to facilitate student preparation prior to training, and (b) tools to enhance collaboration and learning during and after training. Tools useful in preparing students prior to training by providing access to presentation materials include online presentation tools such as GoogleDocs, Slideshare, and Prezi. In addition, instructors may use wikis and blogs to post training materials and links to additional learning resources and to solicit student contributions. The authors suggest the use of additional collaborative technologies such as whiteboards, shared documents, online survey/quizzes, and multimedia platforms, both during and after training. The authors posit that the use of

collaborative technologies before, during, and after face-to-face training can facilitate student engagement and learning outcomes.

Lee, H., & Bonk, C. J. (2014). Collaborative learning in the workplace: Practical issues and concerns. *International Journal of Advanced Corporate Learning*, *7*(2), 10-17. doi:10.3991/ijac.v7i2.3850

Abstract. This study examines perceptions of corporate personnel including learning managers and instructional designers related to workplace collaboration and associated technology tools that might foster or enhance it. First, we identify future research interests and concerns related to collaboration and collaborative tools as revealed from an online survey of 97 respondents. Second, we verify the primary collaboration issues and concerns in corporations through an open discussion forum in which 30 corporate personnel participated. Findings indicate that the use of collaborative tools is growing in importance in the workplace as is collaboration in general. In addition, group discussions reveal five main collaboration concerns in corporations including factors to consider when selecting and using collaborative tools.

Summary. This article focuses on the use of collaborative tools in the workplace as a way to promote innovation, collaboration and learning among employees. Based on survey results, preferred collaborative tools include wikis, blogs, social media, discussion boards and video, with wikis being the overall preferred tool. Research findings cited by the authors show that adult professionals are most interested in the use of collaboration tools in order to facilitate knowledge and workplace skills development. In addition, respondents in the survey are interested in the use of collaboration tools in a

blended learning environment in order to enhance the overall learning experience and transfer of knowledge. Potential areas of concern related to implementing collaborative technologies within an organization center around workplace generational differences and individual learning preferences. This article is relevant for the research topic of this annotated bibliography because it explores the use of collaborative tools with formal learning practices.

LeNoue, M., Hall, T., & Eighmy, M. A. (2011). Adult education and the social media revolution. *Adult Learning*, *22*(2), 4-12. Retrieved from http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=eric&AN=EJ926216&login.asp&site=ehost-live&scope=site

Abstract. The advent of Web 2.0 and the spread of social software tools have created new and exciting opportunities for designers of digitally-mediated education programs for adults. By supporting the use of interactive methods and multi-media materials, social software offers educators more ways to engage learners than any preceding educational technology. Social software also empowers curriculum designers to more effectively accommodate many of the core principles of adult learning than was possible with earlier e-learning technologies. This article offers an overview of the compatibility between the capabilities of social software and the principles of adult education.

Summary. In this article, the authors explore today's adult student's needs to participate and connect with others during the learning process. The authors examine how the use of Web 2.0 technologies can facilitate the move of training from a teacher-centric environment to a more interactive and collaborative community of learning, thus

satisfying one key focus of this research study by identifying and applying specific collaborative technologies to the adult learning process. The key technologies cited by the authors include social software such as (a) wikis, (b) online communities, (c) social network sites, and (d) Rich Site Summary (RSS) feeds. The authors conclude that these new technologies aid in the design and overall delivery of adult learning by increasing student interaction, supporting student collaboration, and supporting student self-direction.

London, M., & Hall, M. (2011). Unlocking the value of web 2.0 technologies for training and development: The shift from instructor-controlled, adaptive learning to learner-driven, generative learning. *Human Resource Management, 50*(6), 757-775. Retrieved from Business Source Complete database: http://web.a.ebscohost.com.libproxy.uoregon.edu/ehost/pdfviewer/pdfviewer?sid=4f83960b-63b5-47bd-bba0-b26b317fc893%40sessionmgr4004&vid=1&hid=4104

Abstract. Web 2.0 technologies can support both adaptive and generative learning but are especially valuable for generative learning. This article reviews learning processes and Web 2.0 capabilities, describes two case examples, outlines ways to design Web 2.0 training applications, and discusses the changing role of learning professionals from delivering structured, one-way adaptive learning to designing and facilitating generative learning opportunities. The article concludes with ideas for corporate education and research on Web 2.0-based learning processes, including utilizing the technology to track and improve learning.

Summary. This article by London and Hall provides two business case examples where collaborative technologies combine with formal learning practices to deliver training to adults in a professional setting, thus satisfying one key focus of this research study by identifying and applying specific collaborative technologies to adult training in the workplace. Each case example provides specifics regarding the types of collaborative technologies used and the reason for their use in the training. The first case example highlights the use of whiteboards, chats, polls, and blogs for learner reflection. The trainers in the second case example chose virtual worlds, simulations and gaming to enhance the learning process. The participants in each case example saw benefits from the use of collaborative technologies. These benefits include increased student collaboration, greater student participation, and opportunities for student reflection. In addition to the benefits of using collaborative technologies, the authors note potential challenges for both students and instructors. Challenges include start-up costs, the learning curve of new technologies for both student and instructor, and the potential for low learner motivation in using the collaborative technologies.

Morgan, J. (2012). The collaborative organization. A strategic guide to solving your internal business challenges using emerging social and collaborative tools. New York, NY: The McGraw-Hill Companies.

Description. In his book, *The Collaborative Organization,* Jacob Morgan provides an actionable guide for implementing collaboration technologies in organizations to help solve internal business challenges. Morgan covers a variety of collaborative technologies, provides tips on associated risks with implementing collaborative

technologies, along with methods for gaining adoption of collaborative technologies by employees.

Summary. *The Collaborative Organization* provides guidelines for creating and executing social and collaborative technologies in organizations to promote collaboration, knowledge sharing, and knowledge transfer among employees, thus satisfying one key focus of this research study by identifying and applying specific collaborative technologies in a workplace setting. Focus is on adoption of collaborative technologies within an organization and how an organization can benefit from incorporating these technologies. The use of Jacob's own research, interviews, case studies, and survey responses provides a vendor-neutral look at best practices for implementing collaborative technologies within an organization. The author provides case studies from organizations of various sizes around the world that overcame business problems by implementing collaborative technologies. One case study of particular interest is of a telecommunications company in Canada. Through their use of collaborative technologies and the blending of formal learning with informal learning, employees are more engaged in the learning process and are helping to share knowledge and educate each other.

Formal Learning / Informal Learning

Ambrose, J., & Ogilvie, J. (2010). Multiple modes in corporate learning: Propelling business IQ with formal, informal and social learning. *Journal of Asynchronous Learning Networks*, *14*(2), 9-18. Retrieved from

http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=eric&AN=EJ909869&login.asp&site=ehost-live&scope=site

Abstract. Recognizing that the shifting corporate environment is placing ever greater stresses on learning organizations, this paper reports how companies are increasingly offering employees a wide choice of learning options beyond conventional classroom training, including online, social learning, and other modalities in "blended" programs. Outlining a taxonomy of corporate learning, the authors divide the training enterprise into formal, informal, and social learning modalities.

Summary. This article focuses on the need for organizations to shift from traditional, formal training practices to a new learning framework which encompasses collaborative technologies to aid both formal and informal learning. This new learning framework blends traditional practices with new learning tools such as social platforms that enable a learner to extend learning beyond the classroom. The authors posit that the blending of formal learning, informal learning, and social learning enables organizations to adapt to and overcome the business challenges of managing and disseminating information and addressing the learning needs of employees. The authors conclude that the key to blended learning is the combination of appropriate technologies and delivery methods that maximize both the learner experience with the overall business needs of an organization.

Chen, B., & Bryer, T. (2012). Investigating instructional strategies for using social media in formal and informal learning. *International Review of Research in Open and Distance Learning*, *13*(1), 87-104. Retrieved from

http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=eric&AN=EJ979641&login.asp&site=ehost-live&scope=site

Abstract. This qualitative study explores the use of social media among faculty in the discipline of public administration in the United States. Instructors perceive that informal learning using social media could be facilitated by instructors and integrated into formal learning environments for enriched discussions, increased engagement, and broad connections. This study offers strategies for and examples of how social media can be used to connect formal and informal learning.

Summary. This article focuses on the use of collaborative technologies to connect formal learning and informal learning environments, thus satisfying one key focus of this research study by providing context for the blending of collaborative technologies that enable informal learning with more traditional instructor-led practices based on formal learning pedagogy. Based on qualitative data gathered from interviews with 57 faculty members from across the United States, the authors conclude that the use of collaborative technologies in formal learning results in: (a) innovative and collaborative interactions among students, (b) application of textbook knowledge to real-life situations, and (c) individualized learning.

Choi, W., & Jacobs, R. L. (2011). Influences of formal learning, personal learning orientation, and supportive learning environment on informal learning. *Human Resource Development Quarterly*, *22*(3), 239-257. Retrieved from http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=eric&AN=EJ946167&login.asp&site=ehost-live&scope=site

Abstract. While workplace learning includes formal and informal learning, the relationship between the two has been overlooked, because they have been viewed as separate entities. This study investigated the effects of formal learning, personal learning orientation, and supportive learning environment on informal learning among 203 middle managers in Korean commercial banks. It was found that formal learning and personal learning orientation have significant and positive impacts on informal learning. Although a supportive learning environment did not have a direct effect on informal learning, it had a modest but significant indirect effect on informal learning through formal learning.

Summary. In their study, Choi and Jacobs explore the relationship between formal learning, workplace environment, and informal learning of adults in a professional setting. Based on data gathered from middle managers in the Korean banking sector, the authors measured the effectiveness of formal learning, personal learning orientation, and a supportive learning environment. The authors offer three hypotheses: (a) formal learning will be positively related to informal learning, (b) personal learning orientation will be positively related to formal and informal learning, and (c) supportive learning environments will be positively related to formal and informal learning. The findings suggest that informal learning and formal learning are complementary and that the blending of these two types of workplace learning approaches is most effective for learning effectiveness, thus satisfying one key focus of this research study by providing a context for the blending of formal and informal learning in workplace learning environments.

Kim, K., Bonk, C. J., & Oh, E. (2008). The present and future state of blended learning in workplace learning settings in the United States. *Performance Improvement*, *47*(8), 5-16. Retrieved from http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=eric&AN=EJ809085&login.asp&site=ehost-live&scope=site

Abstract. This article reports a survey about blended learning in workplace learning settings. The survey found that blended learning gained popularity in many organizations but also that several barriers exist in implementing it. This survey also includes predictions on instructional strategies, emerging technologies, and evaluation techniques for blended learning.

Summary. This article focuses on blended learning models; combinations of traditional formal learning approaches with informal learning. Based on their study, the authors offer benefits of blended learning and suggestions for overcoming barriers to implementing blended learning in workplace settings, thus satisfying one key focus of this research study by providing a context for the blending of formal and informal learning in workplace learning environments. Based on the findings of their study, the authors posit the benefits of blended learning include (a) availability and accessibility of learning, (b) improving the quality of the learning experience, and (c) cost reductions. Identified barriers to implementing blended learning include (a) insufficient management support and commitment, (b) learners lacking self-regulated learning skills, and (c) organizational/cultural resistance. In addition, the outcome of the study ranked the top emerging technologies expected to be used in blended learning,

including (a) webcasting/video streaming, (b) digital libraries and content repositories, (c) knowledge management tools, and (d) online simulations.

van Dam, N. (2012). Designing learning for a 21st century workforce. *T + D, 66*(4), 49-53,6. Retrieved from http://search.proquest.com/docview/1016792610?accountid=14698

Abstract. Personal and organizational learning does not need to be one-size-fits-all. Rather, it can take place through multiple blended formal and informal learning solutions. It is important that formal learning solutions always are designed to improve the capabilities of people and enhance the performance of the organization. It is a best practice to blend formal with informal learning solutions to achieve this goal.

Summary. This article provides a learning framework that blends formal learning and informal learning. The framework suggests 10% of learning take place through formal learning and 90% of learning takes place through informal learning. The author, Nick van Dam, explores the various types of learning that make-up both formal and informal learning and posits that blending the various learning methods aids in the promotion of learning efficiencies and outcomes. Formal learning is categorized as planned learning such as instructor-led, classroom based learning. Informal learning consists of social learning, on-demand learning, and career learning. Social learning leverages Web 2.0 technologies such as online communities, blogs, chat, and wikis. On-demand learning leverages technologies such as videos, recorded webinars, and e-books. Career learning consists of special projects, coaching, and feedback. The author concludes that with the use of instructional design theories and pedagogical concepts, instructors are able to

design effective blended learning solutions that combine formal learning elements with collaborative technologies.

Learner Satisfaction, Learner Motivation, and Transfer of Learning

Gunawardena, C., Linder-VanBerschot, J., LaPointe, D., & Rao, L. (2010). Predictors of learner satisfaction and transfer of learning in a corporate online education program. *American Journal of Distance Education, 24*(4), 207-226. Retrieved from Academic Search Premiere database: http://www.tandfonline.com.libproxy.uoregon.edu/doi/pdf/10.1080/08923647.2010.522919

Abstract. This study explores factors that predict learner satisfaction and transfer of learning in an online educational program at a multinational corporation, established to improve organizational learning by providing training in technical skills. The online courses were designed using a problem-centered and case-based approach to learning and utilized a variety of collaborative technologies. Online self-efficacy emerged as the strongest predictor of learner satisfaction; collegial support was the strongest predictor of transfer of learning.

Summary. This article focuses on the transfer of learning in a workplace. The authors define the transfer of learning as "the learner's ability to apply the skills and knowledge learned in the course to the workplace both during and after the course" (Gunawardena, Linder-VanBerschot, LaPointe, & Rao, 2010, p. 209). Based on their literature review, the authors perform a study based upon questionnaire responses from engineers, technicians, group leaders, and managers from a United States

corporation and its international sites. Based on the responses of thirty-seven learners in the study along with the qualitative data, the authors surmise that collegial support is the greatest predictor of transfer of learning. The authors identify a key contributor to this successful transfer of learning as managerial support. The students who reported the successful transfer of learning had worked with their manager to set goals prior to the learning. The authors conclude that this step is a key element for trainers to consider when designing learning.

Noe, R. A., Tews, M. J., & McConnell Dachner, A. (2010). Learner engagement: A new perspective for enhancing our understanding of learner motivation and workplace learning. *Academy of Management Annals*, *4*(1), 279-315. doi:10.1080/19416520.2010.493286

Abstract. Organizations invest millions of dollars in workplace learning programs to develop human capital for competitive advantage. The effectiveness of workplace learning programs is directly linked to learner motivation. However, we contend that our current understanding of learner motivation and workplace learning is limited by the tendency to conduct research based on the traditional instructional system design model and the limited adoption of organizational behavior theories to guide such research. We review studies of learning methods and contextual factors that likely influence learner engagement.

Summary. This article focuses on formal learning and informal learning practices and their abilities to engage and motivate the adult learner, thus satisfying one key focus of this research study by identifying adult learner motivators and exploring learner

satisfaction of adults in various learning processes. The authors contend that psychological engagement theory can provide valuable insight into and understanding of learner motivation and workplace learning. The authors explore both formal learning and informal learning and the various motivators of students in the different learning approaches. In addition, the authors examine the learning context, which consists of organizational climate, interpersonal dynamics, and individual differences and their influences on learner motivation and the transfer of learning. The authors conclude that there are three psychological conditions that promote learner engagement and motivation: (a) safety, (b) meaningfulness, and (c) availability of the learning.

Zhao, F., & Kemp, L. (2013). Exploring individual, social and organisational effects on Web 2.0-based workplace learning: A research agenda for a systematic approach. *Research In Learning Technology, 21*(3). Retrieved from EBSCO database http://search.ebscohost.com.libproxy.uoregon.edu/login.aspx?direct=true&db=eric&AN=EJ1015718&site=ehost-live&scope=site

Abstract. Web 2.0-based workplace learning is defined in this article as informal learning that takes place in the workplace through connections and collaborations mediated by Web 2.0 technology. Web 2.0-based workplace learning has the potential to enhance organisational learning and development. Drawing on a selective review of the theories and research on social exchange, social capital, communities of practice and organisational support, we have developed a testable theoretical model for further empirical study.

Summary. This article focuses on the use of collaborative technologies to enhance learning and learner satisfaction in a workplace setting, thus satisfying one key focus of this research study by identifying strategies for implementing collaborative technologies with formal learning practices to enhance adult learning and satisfaction in the workplace. The authors define collaborative learning as informal learning that takes place in the workplace through connections and collaborations made possible by collaborative technologies. Collaborative technologies explored include (a) blogs, (b) wikis, (c) social media, and (d) podcasts/webcasts. The authors' literature review explores two categories of literature: (a) applications of collaborative technologies in the workplace, and (b) collaborative technologies and their use for workplace learning. Following the literature review, the authors present several hypotheses including: (a) self-interest will be positively associated with collaborative technologies for workplace learning, and (b) self-fulfillment will be positively associated with collaborative technologies for workplace learning.

Conclusion

Organizational learning is transitioning from strictly formal classroom-based learning to learner-initiated, collaborative learning due to new technologies known as collaborative technologies (London & Hall, 2011). The 15 references selected for this Annotated Bibliography examine collaborative technologies and provide techniques for incorporating these technologies into the pedagogy of formal learning for adults in a professional setting. For this study, formal learning is defined as learning that is structured, planned, and is instructor-centric (Ambrose & Ogilvie, 2010; Choi & Jacobs, 2011; Zhao & Kemp, 2013). Collaborative technologies examined as part of this research effort include wikis, blogs, discussion forums, and social networking (Amitabh & Sinha, 2012; LeNoue, Hall, & Eighmy, 2011; London & Hall, 2011). To understand how collaborative technologies may combine with formal learning, one must examine formal learning and collaborative technologies along with motivators for student learning. The references are organized in four categories: (a) collaborative technologies, (b) formal learning and informal learning, (c) transfer of learning, and (d) learner satisfaction.

Collaborative Technologies

The demands of the business professional, business dynamics, and the ever-changing global work culture and practices due to collaborative technologies are leading to shifts in the practices of training professionals (Amitabh & Sinha, 2012). Today's adult learners expect training tailored to their specific needs and to be active participants through collaboration with co-workers (Ambrose & Ogilvie, 2010). Amitabh and Singha (2012) posit there is a shift towards "…on-demand learning which alone cannot be met through classroom and online training mediums" (p. 10). Collaborative technologies such as wikis, blogs, discussion forums, and social

networking enable adult learners and instructors to participate in collaborative and supportive learning outside the confines of a traditional classroom (Amitabh & Sinha, 2012; LeNoue, Hall, & Eighmy, 2011; London & Hall, 2011). According to LeNoue, Hall and Eighmy (2011), blending collaborative technologies with formal learning provides instructors "…more ways to engage learners than any preceding educational technology" (p. 4). Lee and Bonk (2014) posit collaborative technologies "…foster a participatory environment where members generate, discuss, and evaluate evolving ideas "(p. 11).

Formal Learning and Informal Learning

Formal learning, when combined with other learning delivery methods, is known as blended learning (Ambrose & Ogilvie, 2010; Choi & Jacobs, 2011; Kim, Bonk & Oh, 2008; van Dam, 2012). Blended learning may combine elements of instructor-led learning, online learning, and social learning (Ambrose & Ogilvie, 2010; Kim, Bonk & Oh, 2008). The use of collaborative technologies with traditional, formal learning offers opportunities for both the trainer and the learner. According to Kim, Bonk and Oh (2008), the emergence of collaborative technologies within organizations provides trainers with new options for designing and delivering blended learning to employees. Ambrose and Ogilvie (2010) state the emergence of collaborative technologies "…promises to bring corporate learning to a new level by using its unique power of amplification, spreading learning to more employees while engaging them in active communities that support their daily work needs" (p. 15). Through the use of collaborative technologies, these active communities help bridge formal learning with informal practical learning.

While literature points to several benefits of blending formal training with informal training using collaborative technologies (Kim, Bonk, & Oh, 2008; van Dam, 2012, Zhao & Kemp, 2013), additional research is needed to explore specific methods for incorporating collaborative technologies into the pedagogy of an instructor-led course for professional adults to maximize learning outcomes. While the study of formal learning and informal learning as distinct topics aids in understanding the strengths and weaknesses of each approach, research that addresses specific means of blending the two learning styles offers promise for those learning professionals who wish to capitalize on the synergies afforded with blended learning.

Learner Satisfaction, Learner Motivation, and the Transfer of Learning

When analyzing the success of different training approaches the concepts of learner satisfaction and motivation are important to gauge the relative strengths of the various approaches. Noe, Tews, and Dachner (2010) identify the psychological conditions of safety, meaningfulness, and availability of learning, as keys to promoting learner motivation. Gunawardena, Linder-VanBerschot, LaPointe, and Rao (2010) conclude the highest predictor of learner satisfaction is online self-efficacy. Through their research, Zhao and Kemp (2013) hypothesize that self-interest and self-fulfillment both positively impact learner satisfaction and transfer of learning.

The ultimate gauge of the effectiveness of training is the ability of the student to apply the lessons. Gunawardena, Linder-VanBerschot, LaPointe, and Rao (2010) define the transfer of learning as "the learner's ability to apply the skills and knowledge learned in the course to the workplace both during and after the course" (p. 209). Collaborative technologies that have proven successful in the transfer of learning include: wikis, social networking sites, and online

communities of practice (Gunawardena, Linder-VanBerschot, LaPointe, & Rao, 2010; Noe, Tews, & Dachner, 2010; Zhao & Kemp, 2013).

Summary

The traditional method of classroom based, instructor-led training has been transformed with the promise of collaborative technologies. Today's learning professionals have the opportunity to embrace blended models that exploit the synergies of formal and informal training. A thorough understanding of the use of collaborative technologies will enable professional trainers to determine the optimum uses for and models of these modern approaches to maximize student learning and satisfaction.

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