

Abstract

A literature review was completed to examine studies addressing technical engagement of students at work to support a future research study to develop and evaluate the effect of on-line community participation on student learning through work. Researchers examined a wide variety of technologies, but in limited combination. Using technology to engage students participating in work-integrated learning enhanced practical knowledge, collaboration, and reflection of students at work. Research that specifically addressed student learning as a goal of technical engagement found that students perceived that community participation enhanced their learning. This literature shows that there is potential for on-line community participation to enhance social interaction, collaboration, and reflection and these elements could affect student learning through work.

Review of Literature

Introduction

A review of the work-integrated learning literature illustrates many themes such as program descriptions (e.g., Chapin, Roudebush, & Krone, 2003), program development (e.g., Neil-Smith, 2001), administrator development or practices (e.g., Chapman, Coll, & Meech, 1999), student perceptions of program/experiences (e.g., Parks, Onwuegbuzie, & Cash, 2001; Cook, Parker, & Pettijohn, 2004), employer perceptions of program/experience (e.g., Wiseman & Page, 2001), benefits of cooperative education to students or employers (e.g., Calway & Murphy, 2000; Delorenzo, 2000; Fuller & Schoenberger, 1991), historical descriptions (e.g., Herr, 1995) emerging trends (e.g., Freeland, Marini, & Weighart, 1998; Hall, 1999), learning outcomes (e.g., Eames, 2000; Hayward, Blackmer, & Raelin, 2007), and student engagement during work experiences (e.g., Hew & Knapczyk, 2007; Mayer, 2002).

Although many themes have been identified in literature about work-integrated learning, this literature review will specifically examine one practice that affects student learning through work – using technology to engage students participating in work-integrated learning. It will address literature gaps in the application of different types of technology and the effects of technical engagement on learning.

The articles included in this literature review were limited to those articles that examined student participation in full-time work experiences during an extended time period (one quarter or semester to one year) that were formally or informally part of the students' overall education.

Application of Technology

A variety of technologies has been used to engage students participating in work-integrated learning. E-mail or listservs were the initial technology applied either alone (e.g., Canale & Duwart, 1999; Hayward, DiMarco, Kranz, & Evans, 2001; Witmer, 1998) or in combination with a resource webpage (McLoughlin & Luca, 2002). As technology advanced, other types of technology emerged. Asynchronous discussion boards were the prominent model of technical engagement, either alone (e.g., Goos & Bennison, 2004, 2005; Hew & Knapczyk, 2007; Maidment, 2006), or as part of an overall virtual environment (e.g., Kelly, Gale, Wheeler, & Tucker, 2007; Mayer, 2002; Stacey, Smith, & Barty, 2004). Blackboard and Web CT, course management systems, were also frequently used as overall virtual environments for students (e.g., Kelly et al., 2007; Roberts-Gennaro, Brown, Min, & Siegel, 2005). The most recent study applied blogging to a nursing practicum (Keegan, 2007). Only one set of researchers developed their own virtual community ILF (Inquiry Learning Forum) (Makinster, Barab, Harwood, & Andersen, 2006). This community was used to compare three different methods of social context

on student teaching reflections and did not focus on the impact of participation in the overall community on learning.

Most studies focused on one element of technical engagement (e.g., e-mail, discussion boards, blogging). Individual types of technical engagement showed promise and raise the question of how multiple levels of technical engagement could influence learning, especially if incorporated into a virtual community specifically designed to enhance learning through work.

Learning

There is limited research about community participation effect on learning through work. Research focused on describing the development of an virtual community or discussion (Bulgar, 2006; Keegan, 2007; Kelley et al., 2008), how the community was established and maintained (Goos & Bennison, 2004, 2005), discussion content as a mechanism for student psychological support (Paulus & Scherff, 2008), whether and how asynchronous discussions were used (Scherff & Paulus, 2006), multi-community participation effects on other communities (Stacey et al., 2004), and benefits and challenges of on-line community use (Mayer, 2002; Maidment, 2006). Two studies measured levels of student reflection (Hough, Smithey, & Evertson, 2004; Makinster et al., 2006); however, neither linked reflection to learning through the work experience.

Of the studies that addressed learning, three themes emerged: the practical knowledge gained through the experience, the impact of collaboration and reflection in the community, and student learning through community participation.

Practical knowledge. Student engagement during work-integrated learning has the ability to enhance overall student learning in a number of ways. Practically speaking, participation in technology-based community allowed students to learn about computer-mediated

communication and e-learning (Canale & Duwart, 1999; Hayward et al., 2001; Stacey et al., 2004). These studies represent some of the older studies reviewed. Computer-mediated communication (such as e-mail, chat rooms, discussion forums, and instant messaging) is, in some cases, ubiquitous. Student use of technology has increased significantly in the short time since these studies were completed; therefore, it is not expected that today's students will have a need to learn about computer-mediated communication.

Engaging in e-mail, listserv, or discussion forums provided an opportunity for students to improve written communication skills (Hayward et al, 2001), understand the needed level and importance of professionalism of their e-mails (Hayward et al, 2001), and ultimately improve the quality of their written internship assignments through constant feedback (Witmer, 1998). Practical learning occurred through virtual community participation. Some of these skills can transfer to the classroom and into work and are worth further investigation for their potential educational value.

Collaborative learning. The collaborative nature of learning through engagement with other peers, mentors, or faculty enhanced student learning in a number of ways. Student-to-student collaboration allowed students to compare and contrast experiences with their peers, allowing students to discover ways to overcome obstacles (Keegan, 2007) or to challenge or change stances regarding professional issues in their day-to-day practice (Kelley et al., 2008). Using asynchronous discussion boards provided students time to consider their views and try them out with colleagues (Mayer, 2000). The access to mentors, faculty, and online resources provided many benefits. Students benefited from just having a mentor to which they could voice feelings or concerns (Hayward et al., 2001) and having timely and immediate instructional support (Scherff & Paulus, 2006). Mentors provided professional advice about complexities of

practice/work (Hayward et al., 2001). Peers and faculty provided support students may otherwise not receive at work (Kelly et al., 2007; Scherff & Paulus, 2006; Stacey et al., 2004) and allowed students to discuss a difficult topic that could not be fully addressed or realized from classroom instruction (Hayward et al., 2001). Student-to-tutor and student-to-student communication enhanced academic, practical, social, and psychological support, particularly for those students in work placements at a distance from the university (Keegan, 2007).

The research indicates that collaboration amongst students and the inclusion of faculty and/or peer mentors as active participants in the community could impact student learning.

Reflection. In a previous section of this review, reflection was shown to affect learning through work-integrated learning. This section more closely examines those studies where reflection occurred through student engagement using technology, whether student learning was affected, not affected, or not examined.

Reflection through student engagement was found to augment learning (Hayward et al., 2001) and made learning explicit (Canale & Duwart, 1999; Hayward et al., 2001). It enabled students to become aware of their personal growth and learning through their experience (Hayward et al., 2001) and their professional growth (Canale & Duwart, 1999). Two studies utilized student mentors to engage with students participating in work experiences. The researchers found that the student mentors realized they were engaged in problem solving when devising mentee e-mails (Canale & Duwart, 1999) and that their reflection was stimulated by connecting their personal past experiences with the current experiences of their mentees (Hayward et al., 2001). These studies show that both mentors and mentees learned through student engagement.

Two studies specifically examined the level of student reflection. Hough et al. (2004) evaluated the level of reflection in student discussion posts over a 3-year period. It was hypothesized that there would be a positive relationship between the level of student reflection and the presence of recognized features of a community of practice in a virtual learning community (that was developed over a 3-year period). The researchers did find a significant increase in reflective postings from year to year as the community developed more features related to a community of practice; however, the level of reflection was not correlated to student learning. Makinster et al. (2006) looked at the effect of social context (private electronic journal, electronic discussion board, or discussion as part of a web-based community) on student reflection. Individual student sentences were coded and the different social contexts were compared and contrasted to find trends. The discussion board and web-based community discussion had the greatest amount of text responses; however, the private journal had the highest frequency of codes that exhibited trends and were identified by the researchers as those categories most important for characterizing the nature and depth of reflection. Again, the reflection was not linked to student learning through their experiences.

A virtual community can provide multiple channels through which students could reflect upon experiences, increasing the overall level of reflection on the experience, which has been shown to enhance learning.

Community effect on learning. Only three sets of researchers specifically indicated community effect on learning/education as a goal of their research study. Hayward et al. (2001) measured the perceived impact on learning by students engaged in a tele-mentoring community. They also questioned whether learning is perceived differently by mentors and mentees. Hayward et al. found that, through reflection, co-op students became aware of personal growth

and learning. Students indicated they had learned effective communication, problem-solving, self-assessment, reflection, and professionalism through participation in tele-mentoring. Mentors learned effective written communication skills and augmented their problem-solving skills. Therefore, some similarities and differences were found in perceived mentor/mentee learning through this experience, but no actual measure of learning was assessed.

Another researcher (Witmer, 1998) who examined learning used computer-mediated communication to enhance communication students' experiences during a summer internship. Findings discussed how the students' written assignments were greatly improved in both structure and conceptual understanding because of participation, and most students managed to apply concepts from the classroom to their work experiences. Connection with faculty also allowed for ongoing instruction in communication concepts and theories. No data or analysis was shared to show improvement in these factors or how they affected overall student education.

The third study to address learning had a goal to better integrate student co-op experiences with their academic coursework through participation in communities (Canale & Duwart, 1999). After a qualitative analysis of the student assignments, the researchers found that students could make better sense of the differences between co-op learning and classroom learning due to co-op experiences and formal reflection, but again, no measure of actual learning was used. Canale & Duwart also raised a concern from students that too many "academic" responsibilities while at work could detract from overall co-op learning. This should be considered in the design of the community. Students should view the community as a learning tool versus as add-on assignment.

Although learning was not measured in these studies, students perceived that community participation affected their learning in several ways. Further research can examine more ways

that community participation can affect learning and how to design community features to affect those items already identified.

Summary

When reviewing literature specific to student engagement using technology while at work, several gaps were found. A variety of different technologies, such as e-mail, discussion boards, blogs, course management systems, and virtual communities, were examined. No analysis or comparisons of the effect of different types of technology or combinations of technology on engagement were completed. Students reported gaining practical knowledge and indicated that collaboration, reflection, and learning occurred as a result of engagement in a community while at work, but only three studies attempted to link engagement and learning. Students did perceive they learned through community participation.

Implications

Based on this literature review, researchers propose a two-phase study. Phase 1 will be a design-based research study to inform the design of the virtual work-integrated learning community, WIL Community, to engage students at work. The WIL Community will not only provide resources and information for students at work but also provide opportunities for social interaction, collaboration, and reflection. Phase 2 of the research study will examine social interaction, collaboration, and reflection in the community and their effect on learning.

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