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Learning Management Systems: A Tool for Post-secondary Co-operative Education Students

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ABSTRACT

Expanding educational opportunities beyond the classroom and embedding them within a work term has created different challenges within academia. This paper will critically examine evidence and arguments for and against the hypotheses that learning management systems (LMSs) can increase a post-secondary Co-operative education (Co-op) student's ability to connect academic theory to work place practice through ongoing reflection and feedback. Although many post-secondary institutions have access to LMS's for academic classes, they tend to be underutilized as a tool to maximize Co-op work term learning and collaboration. Yet, it is important to recognize that online course discussions do not automatically generate quality interactivity between learners. Instead, instructional strategies are needed to facilitate learning outcomes being met (Brindley, Walti, & Blaschke, 2009). This learning paradigm combines reflective learning with online blended learning by recognizing the importance of individual activity as well as collaborative learning (Beckett & Hager, 2002). Current Co-op practice requires the submission of reflective reports at the end of the work term, with no opportunity for academic feedback until the work experience has been completed. A critical change in Co-op practice is required that integrates effective tools and pedagogy that supports student reflective learning during work term semesters.

Keywords: *Co-op, Co-operative education, Co-operative experiential education, reflective learning, reflective practice, reflection, learning management systems, LMS, blending learning, community of learners*

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1 Introduction

Learning occurs in many different environments and although learning is the explicit goal of education, learning theory has a broader range which assumes that learning happens both intentionally and unintentionally as well as with and without the intervention of instructors (Van Gyn & Grover-White, 2011). There is renewed academic interest in Co-operative (Co-op) education as a learning methodology (Cates & Cedercreutz, 2008) this will be the contextual focus of experiential education for this paper.

Van Gyn, & Grover-White, (2011) defined Co-op as the integration of classroom study with specific planned periods of supervised learning through discipline-related work experience. However, taking education out of the classroom and placing it into the work place has created different challenges within education circles. To address academic concerns, reflection and feedback have been identified as the most critical factors for achieving powerful learning outcomes within Co-op programs (Eyler, 2009). This paper will critically examine evidence and arguments for and against the hypotheses that learning management systems (LMSs) can increase a post-secondary Co-op student's ability to connect academic theory to work place practice by increasing opportunities for reflection and academic feedback during the work term.

2 Research Question

Does the integration of LMSs improve Co-op students' ability to apply theory to practice by supporting reflective practice? LMSs have the capability to host synchronous (chat, video conference) and/or asynchronous (forums, email, discussion boards) learning-communication environments (Colazzo, Comai, Davi, Molinari, & Villa, 2010). Although many post-secondary institutions have access to LMS's for academic classes, they tend to be underutilized as a platform to maximize learning and collaboration opportunities during a Co-op work term.

3 Rationale

Learning happens in an environment that is active and meaningful (Griffin, Lorenz, & Mitchell, 2010). Within Co-op programs, students are working directly with employers to test and apply academic theory in the context of work place practice. Blending Co-op work experience with online academic instruction could create a venue for students to engage in the practice of reflection during the work term and in turn create more enriched learning experiences as students learn to apply theory to practice. Howison and Finger (2010) identified two main issues that need to be considered within a blended learning environment. For academics, "the main challenge is to co-ordinate, implement and administer the [students] over varied locations in a consistent manner" (p. 47). For learners, "it is essential to have regular contact with the course coordinator and peers to support their academic learning at the workplace" (p. 47). The implementation of LMSs has the potential to address these issues with dynamic web applications that can facilitate conversations which is not bound by time or location.

Co-op has also integrated the ideas of Schon's (1983) theory of reflection-on-action. This theory suggests that students stop and reflect on their learning after the completion of the experience. This approach proposes that students focus their reflection on why things worked out as they did. Within Co-op, reflection is most often completed at the end of a work term in the form of a final report which is then submitted to a Co-op administrator.

Schon (1983) also formulated a theory of reflection-in-action which is not as commonly integrated into Co-op programs. The theory of reflection-in-action (thinking creatively while acting) encourages reflection simultaneously with experience and not only after the experience (Schon, 1983). The expectation is that reflective practice should be a continuous process that involves thoughtfully considering one's own experiences when applying knowledge to practice. For example, Schon (1983) was referring to the type of learning that includes thinking ahead of a situation to determine the best course of action based upon analysing available information, in combination with reflecting on past experiences to critically respond to new situations. This process allows students to continually reflect and test theories learned in school by responding strategically to new work place scenarios. When students focus on reflection-in-action they have an opportunity to reshape their learning during a Co-op work term.

Reflection-in-action would be most beneficial if it were integrated with ongoing work place mentorship, academic feedback, and facilitated using the integration of a LMS.

Reflection has been used extensively as a frame of reference within Co-op to link theory and practice for students. It is common for students to produce diaries, logs or portfolios in order to reflect upon their experience (Roberts, 2009). Reflective journals are also used across a range of disciplines as a useful tool to promote learning and professional practice that is reflective rather than routine (Thorpe, 2004). Actively guided reflection depends on the course design as well as both the instructor's ability to lead discussions with behavioural-based questions and student engagement (learner interaction with content, instructors, or peers) within a course (Brindley, Walti, & Blaschke, 2009). Reflection has been recognized as an effective instructional strategy for encouraging students to participate in more cognitive engagement to understand the relevance of their work term experience (Bulger, 2006). This means that students should be consistently taking time to critically analyse their work in an effort to strengthen their skills. Bulger's (2006) research encouraged reflection to occur simultaneously with work term experience. An integrating LMS can act as a medium to guide the reflective process between an instructor and a Co-op student and create additional learning opportunities which are learner-centred and self-paced.

Brindley et al., (2009) argued that online learning environments should not just mean access to academic content, but rather they should provide opportunities to share and build learning environments in which students can reflect and connect with their peers to foster learning opportunities. Siemens (2005) suggested that within a digital age, learning is no longer solely dependent on an individual's knowledge and retrieval process. Instead the learning process has evolved with technology, which means we are obligated to research emerging trends in education as a vital component to develop new learning processes.

4 Theoretical Context

Although notoriously difficult to define, reflective practice allows students to make connections to abstract theory. Clouder (2000) created an appropriate working definition of reflective practise as "the critical analysis of everyday working practices to improve competencies and promote professional developments" (p. 211).

There are a number of frameworks that provide a foundation for both Co-op and reflection. Kolb's (1984) experiential learning model has been cited as a pedagogical model of learning that has been legitimized by educational scholars (Beckett, & Hager, 2002; Cates, & Kettil, 2008; & Van Gyn, & Grover-White, 2011). Specifically, he envisioned experience as an essential component of the educational process where academic theory is rooted in focused out-of-the-classroom learning to demonstrate real-world application. Kolb's theory expanded on Dewey's (1938) ideas affirming that in order for learning to take place and to be considered educational, it has to be transformed into knowledge by means of action, reflection and analysis. Kolb's model is composed of four cyclical elements: • concrete experience; • observation of and reflection; • formation of abstract concepts; and • testing in new situations (Kolb's, 1984).

This theory has been identified as an easy framework for students to implement within written reports and in discussing learning with instructors and peers. These four elements are the essence of reflective experiential learning that create deeper knowledge as they move students from experience to reflection and then back to experience. Students are encouraged to connect reflection with action; to make sense of experience to draw implications for future application.

5 Summary of Findings

A variety of instructional strategies have been used with Co-op practices to promote and assess student learning during a work term. These have included learning contracts, journal entries, portfolios, learning assignments and work term reports. The success of these strategies depend greatly on a students' ability to be self-directed and self-regulated (Bulgar, 2006). A LMS has the potential to create a reflective and collaborative learning environment and can meet the needs of students who require direction. However, the current literature (Brindley et al., 2009; Colazzo et al., 2010; Palloff & Pratt, 2005) argue that increased pedagogy should be incorporated into the development of effective LMS environments. The known benefits attributed to an effective LMS environment as a tool to enhance collaborative learning include: • development of critical thinking skills; • co-creation of knowledge; and • reflection to transform knowledge into multiple environments (Palloff & Pratt, 2005).

Yet, Brindley et al. (2009) argued that online course discussions do not automatically create quality interactivity between learners; instead instructional strategies are needed to facilitate learning outcomes.

5.1 Reflective Blended Learning

Co-op environments recognize the importance of written reflection, yet there are a number of critiques of reflection exercises as they are currently designed. First, reflective exercises often rely heavily on a student's own, un-contextualized accounts of events that do not directly determine if learning has occurred (Canale & Duwart, 1999). Wilson, Stull, and Vinsonhaler (1996) stated that within North America we rely too heavily on student work term reports and employer ratings to award credit and too little effort is spent determining what students are really learning. They argue that academic credit should be earned by not simply obtaining work experience but instead for the learning achieved from the work experience.

Providing students with increased opportunities for engaging in structured reflection are more likely to bring a strategic learning orientation to new challenges both in the work place and school environments (Eyler, 2009). Even though Co-op recognizes that structured reflection during a work term can enhance learning, formally structured mechanisms to support ongoing reflection and feedback are not consistently implemented. A purposeful LMS can support the practice necessary for achieving learning outcomes, particularly the use of active reflection to help students link experience with theory to deepen their understanding and their ability to transfer their knowledge (Canale & Duwart, 1999).

Canale and Duwart (1999) researched the impact of internet based reflective learning for Co-op students by critically reviewing a pilot program for 86 engineering students. Within this pilot project, students utilized the internet to access structured learning assignments throughout their work term which were sent to Co-op instructors. These students connected with classmates using a computer conferencing system to conduct virtual reflection during the work term. The purpose of the project was to test reflection-in-action by developing a curriculum that would "enable formal, guided reflection activities to be carried out through individual, coached, and small group methods during the actual Co-op" work term (Canale & Duwart, 1999, p. 25). Students were required to submit monthly learning assignments and to respond to feedback from the instructor and classmates in order to receive a passing grade for the work term. Continuous reflective dialogue provided students with an opportunity to discuss common work-related issues. The discussions were asynchronous, affording students the flexibility to respond on their own schedule in addition to increased opportunities for collaboration and integration of work term experience and academia.

Co-op programs can learn a number of critical points from the Canale and Duwart (1999) study. First, the research openly acknowledged a large number of messages (500) were received but instructors "did not have the resources

to provide individualized feedback” (p. 29). Additional points from the study indicated that students often took their conversations “off-line to go beyond the confines of the assignments” (p. 29). This can be interpreted as a positive factor if creating connections is a goal of the online environment. It can also be interpreted to mean that students did not trust the confidential aspect of the online forum and/or the instructor. Students within the study expressed concern that there were “too many academic responsibilities assigned to them while on Co-op” which might in fact detract from the overall learning experience; many felt it would be better to separate academic activities from work activities while on a Co-op (p. 31). The students wanted to keep communication links open with their post-secondary institution and classmates in the event that they needed assistance. Within this research there is no clear indication if the engineering students had reflective practice embedded within its academic curriculum or if reflective practice was new to their learning process. In addition, a greater cross-section of academic programs would have provided more breadth for the research.

Co-op program administrators recognize the importance of reflection, yet it is challenging to guide students in the critical thinking process or to achieve specific learning goals (Beckett & Hager, 2002). Reflective exercises often rely heavily on a student’s own, un-contextualized accounts of events that do not directly determine if learning has occurred. Knowles, Tyler, Gilbourne and Eubank (2006) articulated the limitations of reflective journals by stating that: “reflection ... is often limited by the practitioner’s own knowledge” (p. 165). Yet, Chives (2010) highlighted the critical importance of self-directed informal learning by arguing that much of the learning required for professional competence occurs within the work place by encouraging students to view all experiences as a potential learning opportunity. To address both view points, LMS can support both personal (shared only with instructor) and public reflective postings which can be shared with other students within the Co-op cohort.

5.2 A Community of Learners

Reflection is one of the steps in the process that is considered crucial in building a knowledge base that goes beyond an individual’s own experience. It is only the first step in the process through which students take inventory of practical experiences, context, and academic subject matter. Combining the use of blending learning pedagogies that support LMS capabilities and on-site Co-op work experiences, is also essential. The integration of a LMS would provide students with an opportunity to build online communities that encourage the formation of collaborative reflective learning environments during a work term (Anderson & Dron, 2011; Correia & Davis, 2007). The results of the Anderson and Dron (2011) study reinforced previous research indicating that the combination of facilitated active discussions and intentionally structured reflective assignments supports individualized reflection and a collaborative learning environment as a community of learners.

Guthrie and McCracken (2010) noted that students participating in their study repeatedly remarked that opportunities for individual and collective reflection allowed them to develop a personalized awareness as they explored new ideas and applied them to present experiences. At the same time, it is essential to produce content that students will find valuable to reflect and collaborate on with their peers. This process requires a knowledgeable instructor to carefully shape an online environment that is pedagogical and purposeful (Anderson & Dron, 2011). To effectively implement this, instructors must: • “create virtual environments that enable ongoing communication, interaction, and relationship building; • develop a teaching approach that fosters autonomy and collaboration; • design and implement methodologies that afford opportunities for critical reflection and inquiry; and • deliver curriculum through universally accessible technologies which support primary learning goals” (Guthrie & McCracken, 2010, p. 79).

Howison and Finger (2010) presented the importance of developing a community of learners to act as a catalyst that engages participation with ongoing and continuous online discussions. The implementation of discussion boards for reflective journaling along with feedback and conversation from classmates and instructors can increase a student's ability to reflect and connect academic knowledge to work place practice within a LMS. This emerging learning paradigm combines reflective learning with online blended learning by recognizing the importance of individual activity as well as collaborative experienced based learning (Beckett & Hager, 2002).

The educational intent for Co-op is to create an environment where students are able to create connections between their work place experience and relevant school theory; yet Co-op does not account for the importance of cohort connections to support learning. Bulger (2006) identified the need to build a structured community of learning and recognized the potential isolation and disconnection a student may feel while being off campus for a work term. With this study, Bulger (2006) identified that in some instances students achieve less than desirable education outcomes and inadequate academic supervision. For this reason, students frequently experienced difficulty transitioning from school to a work term which Bulger (2006) attributed to a lack of connection and collaboration with academia.

In an attempt to address concerns identified within Bulgers (2006) study, faculty members worked in collaboration with the instructional technologist of a public university and designed, implemented, and evaluated a LMS to provide a web-enhanced approach to work terms. They integrated individual learning plans, self-reflective journals, discussion boards, and performance assessments as the basis to determine student learning to provide regular opportunities for reflection within an online community. Of all of these, self-reflection was viewed as the most significant and challenging element and therefore received the most instructional support. A thorough evaluation was conducted upon the completion of the work term from 23 exercise science students which indicated positive aspects of the course design and implementation as well as some limitations. Students appreciated the opportunity to reflect and communicate with peers who were dealing with similar transitional challenges. Yet, 16 of the 23 students identified that they would have liked more time interacting with the course instructor. This could be addressed by providing Co-op instructors with adequate time to address student concerns in addition to setting appropriate expectations of what and how an instructor will be able to dedicate to online office hours. Important factors that should be considered with future research include a more longitudinal study with students from a variety of academic disciplines with an opportunity to compare research results with the inclusion of an experimental control study group.

There is limited research available to guide the development of online communities and measuring its success is challenging due to small experimental design. Dawson (2006) explored potential quantitative approach to evaluate the "relationship between asynchronous forum contributions and the degree of sense of community established" (p.496) among 441 Faculty of Education university students. The conclusion of this research determined that there was no significant correlation between the quality of discussion forum contributions and sense of community which was measured based on Rovai's (2002) Classroom Connectedness Scale. A significant correlation was observed between a student's sense of community and their volume of peer-to-peer interactions within the discussion forum, which was measured using Pearson's correlation coefficient. Dawson's (2006) research brought forward the debate between quantity versus quality as the results of the study indicated that "the quantity of forum postings alone is not an adequate indicator" to determine sense of community (p. 502). At the same time, "active instructor presence was required to support students in developing higher order cognitive skills" (p. 501). From this research, it can be inferred that ongoing instructor interaction would be required to provide Co-op students with abstract theory from practice during a work term.

Tu (2002) maintained that the implementation of online communities also requires the development of a trust

relationship among the participants. This relationship then becomes the foundational layer for the development of a community of learners. Instructors have the capacity to implement and then monitor learning to encourage greater peer interaction. It is important for a community of learners to be motivated and engaged as participants both within their Co-op placement and the online LMSs setting. Correia and Davis (2007) found that peer facilitation, as opposed to instructor facilitation, in online discussions was the most popular collaboration design preferred by online learners. Students found peer-facilitated discussions more meaningful and interactive and felt their contributions created a strong sense of community.

An essential factor for achieving powerful learning outcomes from Co-op is the inclusion of opportunities for collaboration, feedback and reflection. A LMS is capable of creating communities of learners where students can access both synchronous and asynchronous communication applications as a medium to stay connected with the academic institutions and peers while on a work term. Discussion boards offer students a venue to ask questions and exchange ideas for concerns that may arise during the work term (Bulger, 2006). LMS applications have the potential to promote student engagement through the adoption of academically guided, reflective online journaling or blogging that stimulates continuous discussion and enhances learning opportunities to promote collaborative learning during the course of a work term (Howison & Finger, 2010). This approach would be more effective than merely submitting a summary report upon work term completion with no opportunity to correct behaviour during the work term.

5.3 The Co-op Practice

Reflective practice must be taught, rather than seen as an innate ability (Clouder, 2000). If we are going to engage students in Co-op, then it is important to guide students to reflect on experience to achieve maximum learning potential. Even though the research indicated that structured reflection during the Co-op placement can enhance learning, many Co-op programs have no formal structure for reflection during the work term (Fook, 2010).

Reflection as a process helps students to look at experience by first taking a step back, to frame it with context, and to derive meaning from it. Framing the experience helps students unveil and connect their work and integrate it into learning within the class room (Fook, 2010). Most student reflection exercises are written, such as completing journals, guided questionnaires, diaries and papers, and are used to promote reflective thinking and as a measure of academic validation of learning within Co-op. The importance of written reflection is that it requires externalization, which distributes some of the process from inside the head to the outside world. (Knowles et al., 2006) It is clear that learning through everyday experience is not enough and that it is the ongoing reflective process which facilitates an individual's learning.

The ongoing challenge for Co-op is to determine the most appropriate academic assessment that satisfies the requirements of employers, educational institutions and the individual student, while encouraging reflection and integration of theory and practice. Advocates of experiential education embrace an educational philosophy that focuses on learning from experience, but equally important is the process of reflecting on that experience (Knowles et al., 2006). According to experiential learning theoretical frameworks, learning is considered a process that involves industry specific experience but more importantly the "active" workplace participation and the "thinking" or reflection about that experience and context.

5.4 Implications for Co-op Education

Co-op is an experiential method, but learning from experiences is not automatic; circumstances conducive to reflection need to be created. It is important to implement Co-op experiential design that encourages individuals to become critical thinkers and reflective, self-directed learners by extracting meaning from their experience, and to pass the learning on in collaborative environments (Brindley et al., 2009). Co-op can lead to more powerful academic learning and help students achieve intellectual goals commonly associated with liberal education, including: • a deeper understanding of subject matter than is possible through classroom study alone; • the capacity for critical thinking and application of knowledge in complex or ambiguous situations; and • the ability to engage in lifelong learning, including learning in the workplace (Eyler, 2009, p. 26). Co-op also identifies the practices necessary for achieving these outcomes, particularly the use of structured reflection to help student's link experience with theory to deepen their understanding and ability to transfer their knowledge. Griffin, Lorenz, & Mitchell (2010) noted that students who repeatedly engage in structured reflection are more likely to bring a strategic learning orientation to new challenges.

Yet, time must be given to prepare students for reflective practice prior to a work term (Eyler, 2009). Students should be prepared to take ownership of their Co-op experience by planning their academic goals prior to a work term and have a process in place for continuous reflection during the work term rather than just a single report at the end of the work term experience. This would be particularly important when regular classroom debrief meetings are difficult to arrange. Challenging, continuous and context-appropriate reflection turns work experience into learning experience (Roberts, 2009). The intent within Co-op is to ensure job activities have a purpose and become learning activities especially when students are scattered across many employers. Yet, even when instructors understand the importance of reflection for linking theory to practice within a work term, they can find it difficult to design LMS courses and implement a structure to encourage continuous reflection and feedback.

Chives (2010) proposed integrating learning contracts to ensure students clearly identified learning with a strong emphasis on the development of workplace competencies and its assessment. For Wilson, Stull, and Vinsonhaler (1996), a new vision involved conceiving, defining, and presenting Co-op "as a curriculum model that links work and academics – a model that is based on sound learning theory" (p. 158). Griffin et al., (2010) have initiated a Co-op experiential educational framework to conceptualize a model called InCoRe, an acronym for "integration, coordination and reflection". This model is intended to encourage reflection, prior to, during, and after Co-op. This project is currently under review and may have important outcomes that will affect the future of Co-op which includes a student self-assessment of established competencies. The next phase is redesigning the work place assignments to include increased reflection and student self-assessment, particularly related to pre-determined competencies. The intention is to fully engage Co-op into a student-based reflection oriented environment to support student learning outcomes. This will be important research to follow in the near future which will have a positive impact on the future of Co-op programs worldwide.

6 Recommendations

Co-op is an experiential method, but learning from experiences is not automatic; circumstances conducive to reflection need to be created. It is important to implement Co-op experiential designs that encourages individuals to become critical thinkers and reflective, self-directed learners by extracting meaning from their experience, and to pass the learning on in collaborative environments (Brindley et al., 2009). Co-op can lead to more powerful academic learning and help students achieve intellectual goals commonly associated with liberal education, including: • a deeper understanding of subject matter than is possible through classroom study alone; • the capacity for critical thinking and application of knowledge in complex or ambiguous situations; and • the ability to engage in lifelong learning, including learning in the workplace (Eyler, 2009, p. 26). Co-op also identifies the

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7 Conclusions

The evidence does suggest that the most critical factor for achieving powerful learning outcomes from Co-op programs is the inclusion of opportunities for feedback and reflection (Eyler, 2009). Many programs place emphasis on practical knowledge by focusing on the required number of work hours instead of on the individual learning experience within the work place. There is an increasing need for critical reflection that enables an understanding of how people learn from experience (Fook, 2010). Integrating work place experience with online reflection can provide a venue for Co-op students to combine independent work place experience with collaborative electronically mediated learning (Anderson & Dron, 2011; Bulger, 2006; Dawson 2006).

Although, the research indicated that structured reflection during a Co-op term is essential to learning, many programs have no opportunity for feedback until after the work term is completed (Fook, 2010). The expectation is that reflective practice is a continuous process of recalling theories learned in the classroom as frames of reference in the work place from which meaning is conceptualized and knowledge applied to solve future problems in new environments (Estes, 2004). Howison and Finger (2010) supported the need to strengthen the Co-op experience by engaging students in reflective practice “enabled through more interactive discussion online coupled with regular contact by supervisors and coordinators” (p. 47). The current education environment emphasizes

pedagogical value to embedding both a sense of community and online technology in an effort to enhance the overall student learning experience and engagement in the learning process (Dawson, 2006). Yet, continued large scale empirical research will be required to continue to analyze the impact and outcome of implementing a LMS to support Co-op reflective learning during a work term.

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