# AN EXPLORATION OF TRANSFER OF LEARNING OPPORTUNITIES IN AN ONLINE CO-OPERATIVE EDUCATION PREPARATORY CURRICULUM

by

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B.A., Simon Fraser University, 2000

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

In the
Faculty of Education

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SIMON FRASER UNIVERSITY

Spring 2010

# APPROVAL

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| **Degree:** | Master of Arts |
| **Title of Thesis:** | An Exploration of Transfer of Learning Opportunities in an Online Co-operative Education Preparatory Curriculum |

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# ABSTRACT

The purpose of this study was to explore the transfer of learning in an online co-op preparatory curriculum through an analysis of students' discussions to understand if the thinking skills exhibited were consistent with what is understood about bridging techniques that support the transfer of learning. Qualitative content-analysis based on a priori codes were used to analyze the thinking skills of the participants. The key findings with respect to demonstrating support for the transfer of learning were: 1) strong evidence for metacognitive reflection, 2) some evidence for anticipating applications and parallel problem solving, 3) limited evidence for generalizing concepts, and 4) weak evidence for using analogies.

**Keywords:** bridging techniques; thinking skills; transfer of learning; co-operative education

## DEDICATION

I dedicate this work to my loving parents, Maria and Arpad. You have given me the strong foundation and encouragement to make this possible. Mom, your love of books has always inspired me to read and learn, and yes, "I am finally done my test." Dad, I think you are right, "no matter how long it takes, getting an education is time well spent."

I would also like to dedicate this work to my beautiful sister Jennifer for all her strength, courage and growth over the past year, and for believing in herself.

Finally, Chris, your quiet wisdom and patience with my ongoing distractions is a gift that allowed me to finish this work.

# ACKNOWLEDGEMENTS

A very special and heartfelt thank you to Dr. Cheryl Amundsen for your incredible knowledge and wonderful support in guiding me through this work. I've learned so much from you! Most importantly, I would like to thank you for having faith in me.

An appreciative thank you to Dr. Kevin O'Neill for your interest and guidance in my research. Your knowledge, contributions, and wealth of resources have greatly expanded my skills as a critical researcher.

A grateful thank you to Dr. Nancy Johnston for planting the seed many years ago and making me curious about education and research. Our discussions over the years and your knowledge and research have inspired me more than you know.

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# CHAPTER ONE: INTRODUCTION, PROBLEM STATEMENT, AND RESEARCH QUESTION

## INTRODUCTION

The purpose of this study was to explore the opportunities for transfer of learning in a co-operative education (co-op) preparatory curriculum designed to support co-op students' transitions between the classroom and the workplace. Specifically, students' online discussions were analyzed to determine if the thinking skills exhibited were consistent with what is understood to support the transfer of learning. This researcher is employed as a Curriculum Manager in the Work Integrated Learning unit at Simon Fraser University. The researcher has profound interest in the transfer of learning as a core underpinning in education and more specifically, in how co-op curriculum may support the conceptual transfer of learning as students move between school and non-school learning contexts. It is anticipated that the understanding generated from this study will have considerable practical implications that inform current instructional strategies in the co-op preparatory curriculum as well as enhance future curriculum development in co-op programs. This study employed a qualitative content-analysis methodology based on Fogarty, Perkins, and Barrell's (1992) five bridging techniques as instructional strategies that support the transfer of learning. Research participants were co-op students who were enrolled in the

co-op preparatory curriculum at Simon Fraser University and consented to participate in the research.

This chapter begins with an overview of the background and context that frame the study. Following this, the problem statement is described and the accompanying research questions are outlined. Included in this chapter is a discussion about the research approach and information about the assumptions that the researcher brings to this work. The chapter concludes with a discussion about the rationale and significance of the study to the broader field of co-operative education and transfer of learning.

## BACKGROUND

> *"There is no more important topic in the whole psychology of learning than transfer of learning…Practically all educational and training programs are built upon the fundamental premise that human beings have the ability to transfer what they have learned from one situation to another…There is no point to education apart from transfer" (Desse, 1958, p. 213).*

Given the steady changes of society, economics and politics, and the continual growth in technology and science, as well as the numerous job changes that workers may undertake, transfer of learning is a principal concern for educators and trainers who find their chief responsibility to prepare learners to perform effectively in their given situations. Transfer of learning has been studied for more than one hundred and fifty years and examines the impact of existing knowledge, skills, strategies, and abilities on new learning and performance beyond the context of acquisition. In recent years, concerns about the lack of

empirical evidence for the positive transfer of learning have grown despite 1) intense research by psychologists dedicated to understanding the theoretical implications that support the transfer of learning (e.g. enhancing the conditions of academic courses), and 2) an increase in practical applications for the transfer of learning (e.g. organizational funding allocated to training). For example, Baldwin and Ford (1988) found inadequate transfer outcomes in organizational training as did Mosel (1957), suggesting that the training conducted on the job had limited impact on subsequent job performance. Overall, Marini and Genereux state that the transfer of learning research findings are "replete with reports of failure" (1995, p. 1) suggesting that significant transfer is difficult to achieve.

Findings from the transfer of training literature related to job training are similar to the findings related to academic learning. For example, in 1983 the Laboratory of Comparative Human Cognition found that insufficient connections in problem solving were made between what was learned in school and daily life. Additional findings also fundamentally concluded that transfer of learning can't be taken for granted (Marini and Genereux, 1995). Educators now understand that transfer is difficult to achieve and may not even occur in situations where it would be readily expected. Consequently, some argue that in order to enhance the transfer of learning, educators need to explicitly teach transferable thinking skills (Bereiter and Scardamalia, 1986; Palincsar and Brown, 1984; Schoenfeld, 1985) and as such, instructional strategies become significant in achieving this goal.

This signifies an educational issue and begs the question, "How can educators best teach for the transfer of learning?" Direction for approaching this

educational issue can be found in Pea's (1987) work in which instructional

strategies related to teaching for the transfer of learning are discussed. The

theoretical underpinnings of Pea's instructional strategies flow from the view that

the "central issue in acquiring knowledge is its appropriate transfer beyond the

contexts and contents of first acquisition" (Pea, 1987, p. 38). Appropriate

transfer is explained through Pea's (1987) interpretive perspective of transfer

wherein the learner is selective and thoughtful in his application of prior

knowledge or skills to new contexts in a manner that recognizes the importance

of cognitive, social, and cultural aspects of transfer. Pea synthesized

psychological research based in interpretive perspectives and the findings

resulted in the identification of "specific features of thinking-skills instruction

effective for promoting transfer" (Pea, 1987, p. 38). The thinking skills

instructional strategies included "learning about and practicing knowledge

application in multiple contexts of use, constructively participating in bridging

instruction across school and non-school problem situations, thinking and self-

management skills taught within domains, and synergistic integration of the

learning of different subjects" (Pea, 1987, p. 38).

The instructional strategies related to teaching the thinking skills for the

transfer of learning typically come in two formats, namely hugging and bridging

techniques, both originally discussed by Salomon and Perkins (1988). Hugging

techniques foster the transfer of learning by "making the learning experience

more like the ultimate application" (Fogarty, Perkins, & Barrell, 1992, p. xii).

Fogarty et al. (1992) identified five hugging techniques in the instruction of

thinking skills for the transfer of learning, these are 1) setting expectations, 2) matching experiences, 3) simulating situations, 4) modelling application contexts, and 5) employing problem-based learning. Bridging techniques foster the transfer of learning by making explicit for learners the conceptual connections between what has been learned and a novel application by "mindfully abstracting knowledge and skills from one context and applying them in another" (Fogarty et al., 1992, p. 64). Fogarty et al. (1992) identified five bridging techniques in the instruction of thinking skills for the transfer of learning, these are 1) anticipating applications, 2) generalizing concepts, 3) using analogies, 4) parallel problem solving, and 5) metacognitive reflection.

## CONTEXT OF THE STUDY

Co-operative education is a learning strategy that provides a structured method for bridging academic learning with practical experiences in the workplace. The co-op model is embraced by many institutions (nationally and internationally) as an approach that complements academic learning within an experiential learning framework in an effort to enhance learning and to prepare students for productive transitions to the world of work. As defined on the Canadian Association for Co-operative Education website (2009):

"Co-operative Education Program" means a program which alternates periods of academic study with periods of work experience in appropriate fields of business, industry, government, social services and the professions in accordance with the following criteria:

(i) each work situation is developed and/or approved by the co-operative educational institution as a suitable learning situation;

(ii) the co-operative student is engaged in productive work rather than merely observing;

(iii) the co-operative student receives remuneration for the work performed;

(iv) the co-operative student's progress on the job is monitored by the co-operative educational institution;

(v) the co-operative student's performance on the job is supervised and evaluated by the student's co-operative employer;

(vi) the time spent in periods of work experience must be at least thirty per cent of the time spent in academic study.

Co-op programs are viewed as providing "alternative learning environment[s] in which students can explore careers, can be recruited to a career, and can learn workplace skills such as communication and taking initiative" (Munby, Taylor, Chin, & Hutchinson, 2006, p. 116). Moreover, co-op programs intend to reinforce academic knowledge and skills (Hutchinson, Munby, Chin, Edwards, Steiner-Bell, Ho, Chapman, & Mills de España, 2000) which the Government of Canada (2002) recognized as an innovative strategy. It can be suggested that co-op programs present students with the opportunity to realize that academic skills, knowledge, strategies and abilities are transferable to work contexts and subsequently that workplace skills, knowledge, strategies, and abilities are transferable back to academia.  As such, the co-op program has the

potential to serve as a vehicle that fosters the transfer of learning and thus the question becomes, "How can the co-op program best teach for the transfer of learning, and how can students best learn in a non-traditional learning environment?"

## PROBLEM FORMULATION

Inherent in the perspectives of many practitioners of work experience programs are some assumptions about the mechanisms of learning that take place in a work experience. Heinemann, DeFalco, and Smelkinson (1992) revealed that advocates of work experience programs believe that:

1.  the "work or field experience enriches the learning process" (p. 18),

2.  the academic concepts and skills get reinforced when applied in the work context, and

3.  students make connections and achieve understandings in the work context that can't be realized in the academic context alone.

Furthermore, a "key assumption which underlies co-op is that the individual will develop their skills and knowledge through this experiential learning, and in so doing, better contribute to the social and economic fabric of society as they effectively transfer these competencies from context to context" (Johnston, 2003, p. 4).

Contrary to the statements above, Ricks, Cutt, Branton, Loken, and Van Gyn (1993) found that "these are [only] assumptions and are not conclusions reached through research (p. 18)." Consequently, despite the fact that co-op

programs provide an optimal venue for students to realize the transfer of learning, relying on the student alone to foster the transfer of learning between academia and the workplace is insufficient (Ricks et al., 1993). Schaafsma (1996) and Van Gyn (1996) are in agreement with Ricks et al. (1993) and found that co-op programs put excessive focus on the work placement to foster the transfer of learning without evidence of transfer.

Thus, the conjecture by work experience program practitioners that the workplace will foster the transfer of learning required for students to successfully integrate their academic and work experiences is problematic. "Many co-op practitioners expect that the integration and connection-making required for students to see the relevance between their work and goals, and understand and transfer their learning to new contexts will naturally result from their work term experience; in some instances this is the case, in many more it is not" (Johnston, 2007, p. 60). The assumption is however plausible given some findings; for example, in a study by Johnston, Angerilli, and Gajdamaschko (2003), students stated that their co-op learning occurred during the work term largely through dealings with peers, supervisors, and challenges on the job. However, differing from what students report, Johnston (2007) found that students who attempted to make their own meaning typically do not make the connections between academic and workplace learning and "report no workplace-relevant learning occurs in the classroom and vice versa" (p. 42). As such, currently available evidence suggests that transfer of learning cannot be assumed to occur simply through participation in work experience programs.

## PROBLEM STATEMENT

Teaching for the transfer of learning is a principal concern for educators as evidence for the transfer of learning is not found consistently in the literature. The research indicates that transfer of learning is difficult to achieve and must be taught explicitly (Bereiter and Scardamalia, 1986; Palinscar and Brown, 1984; Schoenfeld, 1985). Assumptions made by work experience program practitioners and student self-reports are unsubstantiated as the research shows that co-op students do not readily achieve transfer of learning merely by participating in a co-op work term (Ricks et al., 1993; Schaafsma, 1996; Van Gyn, 1996). Thus, the focal point becomes the curriculum that students participate in prior to undertaking a work experience. Such co-op preparatory curriculum should support students to be able to explicitly think about how their skills, knowledge, and abilities might transfer between school and the workplace context so that they are able to better integrate their collective experiences and transfer them to their advantage in new contexts.

To foster the transfer of learning, Feuerstein, Rand, Hoffman, and Miller (1980), Salomon and Perkins (1988), Fogarty et al. (1992), as well as many other researchers advise the use of instructional strategies that support students' thinking skills. Such instructional supports, also aligned with Pea's (1987) recommended "thinking-skills instruction effective for promoting transfer" (p. 38), are the bridging techniques that foster the transfer of learning by making explicit for learners the conceptual connections between what has been learned and the novel application.

A co-op preparatory curriculum that aims to use such bridging techniques to foster the transfer of learning is the Bridging Online (BOL) course within the Co-operative Education Program at Simon Fraser University (SFU). The BOL course is the online co-op preparatory curriculum that all students complete upon their acceptance into the SFU co-op program. The curricular focus of BOL is "squarely on the student's thinking processes and how those play a critical role in preparing for co-op with respect to optimizing the transfer of learning across various contexts" (Johnston, 2003, p. 20). The intended goal of BOL is to support students to "better interrelate their school and workplace experiences by emphasizing the process of learning and practice that occur in both and by helping students take more control of their learning and their work" (Brown, 1998, p. 6).

BOL is delivered through the online learning management system supported by SFU, namely Web-based Course Tools (WebCT). WebCT is a software application used to create and administer online courses as it stores, finds, and retrieves large amounts of data and contains a discussion forum. The discussions in WebCT are integral to BOL as students use the discussion forums to respond to the BOL course reflection exercises which give evidence of the students' thinking skills and understandings of the BOL learning outcomes.

This study, set in the context of the BOL course (the SFU co-op preparatory program), explores evidence of the transfer of learning to understand if the thinking skills exhibited by students are consistent with what is understood about bridging techniques that support the transfer of learning. Beyond informal

and anecdotal reports, there is no empirical evidence that supports the intention of the BOL course to assist with students' thinking processes in an aim to foster the transfer of learning. Additionally, despite the promise of bridging techniques as an instructional strategy to foster the transfer of learning, Pea (1987) states that "little is known about what may be the best ways to convey these bridging relations" (p. 52). For these reasons, a study that explores the thinking skills exhibited by students participating in BOL is timely so as to 1) understand if the curriculum supports what its aims to support, and 2) to examine the delivery of the bridging techniques in an online environment.

## RESEARCH QUESTIONS

Little information exists about whether the thinking skills exhibited by co-op students participating in the BOL course are consistent with what is understood about bridging techniques that support the transfer of learning, and as such, this study aimed to better understand this phenomenon. To shed light on this problem the research questions are detailed below:

1. The primary research question is: In what ways do co-op students enrolled in BOL show evidence for the thinking skills that underpin the five bridging techniques as outlined by Fogarty, Perkins, and Barrell, (1992): 1) anticipating applications, 2) generalizing concepts, 3) using analogies, 4) parallel problem solving, and 5) metacognitive reflection that are consistent with what is understood to support the transfer of learning?

2. In what ways do co-op employer experts value the thinking skills of co-op students in the BOL course (as exhibited in the primary research question) as relevant in a workplace context with respect to the transfer of learning?

3. In what ways do the BOL course facilitators understand the thinking skills of co-op students and the transfer of learning?

## RESEARCH APPROACH

To answer the research questions, the researcher collected data from multiple sources with the approval of the ethics department at SFU (see Appendix A for ethical approval). Specific to the first research question, the researcher explored the online discussions of two separate BOL courses. This data was investigated only upon the student research participants' completion of the BOL course so as not to interfere with the data collection. To secure student research participant anonymity, no names or identifying markers (WebCT identifications) were used in the database; only the data from those students that had consented to the study were analyzed.

The investigation employed a qualitative content-analysis approach to best service the primary research question. The data were imported into the qualitative data analysis software tool called HyperRESEARCH and coded and analyzed according to the deductive a priori codes derived from Fogarty et al. (1992) which are the five bridging techniques in the instruction of thinking skills for the transfer of learning. This conceptual framework for the study is further discussed in chapter three.

Additional data were collected to answer the second and third research questions. The first set of additional data was drawn from an activity completed by the co-op employer experts (see Appendix I). The co-op employer experts are industry professionals or members of the SFU co-op alumni who interact online in an advisory capacity with students in the BOL course.  To complete the activity, the co-op employer experts were given written rudimentary exposure to the concept of transfer of learning and the five bridging techniques. Following this introduction, the co-op employer experts were asked to complete a task which required them to read excerpts of the student research participants' discussions (the excerpts were the thinking skills as analyzed for in the primary research question). Upon reading the excerpts, the co-op employer experts were asked based on their personal perspective to indicate for each excerpt if they felt that the excerpt demonstrated 'evidence for' or 'evidence against' thinking skills as relevant in a work context with respect to the transfer of learning.  Although the co-op employer experts are not necessarily specialists in thinking skills for the transfer of learning, it was their personal view that was of interest to this study to add supplemental information about the findings to the primary research question in order to deepen the implications made regarding the BOL course.  This data is also important to the study as the co-op employer experts were familiar with the delivery of BOL but had limited biases towards the overall success of the BOL course.  Additionally, drawing on the co-op employer experts as an additional data source honors the co-op model, which focuses on the importance of the co-educator role in the instruction of co-op students. Specifically, the co-op

employer experts are industry partners and employers that have an important partnership with the educational institution as each partner contributes to the students' learning (Groenewald, 2004).  The co-op model is detailed further in chapter two.

The second additional data source was the discussions the researcher held with the BOL course facilitators, also the co-op program coordinators who instruct the BOL course. The BOL course facilitators were asked two questions during a meeting; the first question was related to the BOL course facilitators' perception of the evidence of thinking skills that students demonstrated in the BOL course and the second question centred around how the thinking skills were thought to support the potential for the transfer of learning.

Having multiple data sources allowed for broad support of the research problem.  To support data triangulation, various strategies were employed through this study including a comprehensive literature review, informal discussions with the thesis supervisor and committee members, and intra-coder and inter-rater agreement of the data analysis for the primary research question to ensure trustworthiness of the findings.

## THE RESEARCHER AND ASSUMPTIONS

A researcher's personal history, experience, and interests can affect the topic of study, the methods selected, and ultimately the conclusions reached in a study.  The work of Linn, Howard and Miller (2004) bears relevance here to remind researchers of their ethical obligation to provide the reader with

information that can help situate the researcher's perspectives, experiences, and potential biases.

At the time of conducting this study, the researcher held the dual role of both a graduate student in the Faculty of Education (a Master of Arts candidate in the field of Education and Technology) and an employee in the Curriculum Manager role in the Work Integrated Learning (WIL) unit at SFU. The WIL unit at SFU encompasses the experiential learning programs of co-operative education, community-based learning, volunteer services, and the career services program and is positioned within the Student Learning and Retention division at SFU. As the Curriculum Manager, the researcher had deep and detailed knowledge of the co-op program and works specifically with the BOL curriculum; furthermore, the researcher was involved with curriculum design and development, and delivery of all WIL curricula.  The researcher had limited 'power over' issues on co-op students as this role is the responsibility of the student's co-op program coordinator.  The researcher brought to this inquiry process 1) the practical experience as a working professional at SFU having knowledge and understanding of university programming, 2) deep understanding of co-op curriculum and the co-op context, and 3) the experience of conducting research as a graduate student and support from the thesis committee in the Faculty of Education.

The researcher acknowledged that these experiences and background knowledge were invaluable in this study. Some may view these experiences as a potential limitation in this study as it could be possible that the researcher aimed

to illustrate BOL in a favourable light, thus biasing the research design or interpretations to show evidence of success. To circumvent this liability, three primary assumptions are detailed here and are derived from the researcher's first-hand experience as a BOL course facilitator.  First, the researcher assumed that most bridging techniques in the instruction of thinking skills for the transfer of learning can adequately be delivered through online curriculum. Secondly, the researcher assumed that evidence of thinking skills can be readily identified through the online discussions of students. The final assumption was that the BOL curriculum had potential for enhancement in order to adequately deliver all five thinking skills that underpin the bridging techniques for the transfer of learning, namely improving the use of using analogies.

By making these assumptions explicit at the outset of this study, the researcher showed commitment to engaging in ongoing self-reflection; furthermore, the researcher dialogued with thesis committee members and co-op colleagues, as well, the researcher kept a journal of reflections to serve as an audit trail. Moreover, to address subjectivity and strengthen the credibility of the findings, multiple procedural safeguards were put into place such as additional data sources and  triangulation strategies (intra-coder and inter-rater agreement).

## RATIONALE AND SIGNIFICANCE

Wilson (1988) stated that "I cannot help but feel that, overall, cooperative education research to date has fallen short of the ideal of scientific inquiry to illuminate relationships, predict effects, explain findings in light of existing theory,

or contribute to theory development" (p. 83). For these reasons, this study aimed to add significance to the research in co-op by employing a content-analysis approach based on a priori design to explore the primary research question. The benefits of this approach allowed for the explanation of findings based on pre-established theory and as such, intended to support theory development research in co-op.

The rationale for this study stemmed from the researcher's aim to close a gap in the current body of research as no previous studies looked specifically at co-op preparatory curriculum and its support of the conceptual transfer of learning. In particular, the researcher intended to uncover aspects of the curriculum that potentially support students in their transitions from school to non-school contexts and since students from a range of co-op programs participated in the study, it was hoped that a broad view of co-op programs would be provided. By increasing the understanding of the existing design of co-op preparatory curriculum, further curriculum development may be enhanced through employment of instructional strategies that support the thinking skills for the transfer of learning. As follows, these understandings have practical applications for curriculum development and may potentially enhance the thinking skills required for students to succeed in the transfer of learning in co-op programs.

**KEY TERMINOLOGY**

*Bridging techniques* foster the transfer of learning by making explicit for learners the conceptual connections between 'what has been learned' to novel applications by "mindfully abstracting knowledge and skills from one context and applying them in another" (Fogarty et al., 1992, p. 64).

*Conceptual* pertains to concepts and to the formation of concepts in the mental structure of one's mind in an effort to create concepts, ideas, and connections for future practical applications.

*Experiential learning* is the process of making meaning from direct experience. A definition provided by Keeton and Tate (1978): "experiential learning refers to learning in which the learner is directly in touch with the realities being studied" (p. 2).

*Transfer of learning* examines the impact of existing knowledge, skills, strategies, and abilities on new learning and performance beyond the context of acquisition.

# CHAPTER TWO:  CONTEXT OF THE STUDY: CO-OPERATIVE EDUCATION

The primary purpose of this study was to explore the opportunities for the transfer of learning in the Bridging Online (BOL) course, the online co-op preparatory curriculum. Evidence for the transfer of learning was sought through an analysis of co-op students' online discussions to the BOL course reflection exercises to understand if the thinking skills exhibited were consistent with what is understood about bridging techniques that support the transfer of learning.

Chapter two begins with an overview of the relevant literature that informs understandings about the nature of learning in co-operative education. The overview includes a description of experiential learning and relevant theory, the genesis of co-op, and the co-op model and instructional goals.   This synopsis is critical for laying the groundwork for understanding the co-op model and curriculum at Simon Fraser University (SFU), and more specifically the BOL curriculum.

## EXPERIENTIAL LEARNING

Co-operative education as well as a variety of other learning activities such as apprenticeships, internships, practica, clinical practice, cognitive apprenticeships, job shadowing, work placements, field work, service learning, and community-based learning all fall under the umbrella of work-oriented

experiential learning.  Co-operative education was introduced in the opening chapter as a learning model that provides a structured method for linking classroom-based learning with work-integrated learning. Co-op programs are the prototypical educational models that are meant to bridge academic learning (school) with work learning (non-school) and to provide structure (administrative and pedagogical) for that learning experience.

Dewey (1916) advocated for "learning through doing" in practical hands-on experiences, which is foundational to the experiential learning approach. Experiential learning is based on the philosophy that learners learn best through active engagement in and reflection on meaningful activities. The principles shared by experiential learning programs include (Furco, 1996):

- students are active in the learning process and engaged in a cyclical model of learning,
- instructional strategies such as contextual and conceptual learning, reflection, and application of knowledge to real situations are used to assist students to make meaning out of experiences,
- there is establishment of formal partnerships with outside entities (e.g., industry, community, organizations), and
- the aim is to help students integrate school experiences with external experiences.

With this overview in mind, specific principles of experiential learning may be better understood through a philosophical discussion of the processes of learning in the 'Experiential Learning Model.'

**Experiential Learning Model**

       Some education may be viewed as the teaching of declarative knowledge in conjunction with the procedural components that complement the concepts. "Declarative (explicit) knowledge represents our conceptual understanding of phenomena, whereas procedural (tacit) knowledge represents our skill in doing something" (Raelin, 2008, p. 68). Biggs (1999) noted that learners need to do more than merely acquire information. Instead, learners need to augment their existing knowledge in order to amalgamate declarative and procedural knowledge into functional knowledge. Learners then may apply this functional knowledge to the situations that they are presented with in a way that is integrated even though the augmentation of theory and practice may occur separately. In other words, functionally knowledgeable learners need meaningful experiences (Harvey, Geall, & Moon, 1998) and they need a theoretical framework for which to understand their experiences. Learning from experience presents the learner with the "opportunity to gain and apply knowledge, skills, and feelings in an immediate and relevant setting" (Smith, 2001, p. 2) and Marsik and Watkins (1990) stress that meaning is facilitated by reflection on experience.

       A model of learning that recognizes the need for purposeful and intentional learning from experiences is David A. Kolb's 'Experiential Learning Model' which he developed along with Roger Fry in 1975.   The four stages of learning in the experiential learning cycle are 1) concrete experience, 2) observation and reflection, 3) forming abstract concepts, and 4) testing in new

situations. These four stages are detailed after an overview of Dewey's influences on the model.

Kolb and Fry's 'Experiential Learning Model' emphasized the work of Lewin, Dewey, and Piaget. Most influential was Dewey (1938) who stressed the importance that experience plays in learning. Dewey was a believer in pragmatism, and his position was that the meaning of ideas (or truth as Dewey referred to it) lie within its possible consequences. Also, Dewey believed that meaning is constructed and an ever changing process. As described by Dewey (1938), learning as a continual process of imbalance and restored equilibrium thus engaging active learners that bring with them past experiences. The process of learning according to Dewey (1938) involved:

1) disturbed equilibrium (that may come from an emotional response) wherein the learner,

2) attempts to stabilize the disturbed equilibrium through defining the problem and forming an intellectual response,

3) from this the learner provides a familiar response by way of hypothesis formation, and then the learner,

4) tests and experiments with the hypothesis, resulting in the

5) application of the response to arrive at a renewed equilibrium.

Parallels exist between Dewey's learning process and Kolb's 'Experiential Learning Model' (Roberts, 2006). Both models describe a cyclical process of learning through reflection on 'what one has done' or 'experienced' and focuses

on the individual learning process that relates to how one makes meaning from a direct experience. Figure 1 presents Kolb's (1984) four stage model of experiential learning.
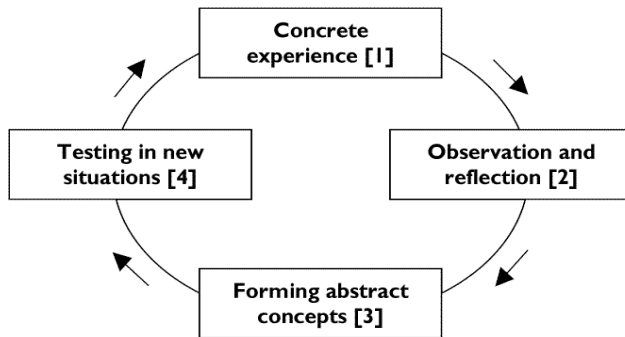


**Figure 1: 'Experiential Learning Model'. Kolb and Fry, (1975).**

Learning in the 'Experiential Learning Model' model can begin at any stage of the cycle. To describe the model here, we begin with the concrete experience stage. Kolb and Fry (1975) suggested that it is during the concrete experience stage, wherein the learner has direct interaction with the phenomenon, that the learner gathers information through apprehension or by "using the senses to see, hear, smell, feel, or taste the phenomenon" (Rogers, 2006). The concrete experience stage is followed by observation and reflection on that experience and information is transformed through intention (Rogers, 2006). Intention is a cognitive process that the learner uses to fragment the experience in order to internalize the information (Kolb, 1984). After this stage, the formation of abstract concepts (the abstract conceptualisation stage) occurs wherein the learner grasps the information through comprehension (Roger, 2006) and establishes some general rules or principles to describe the experience. This

stage is cognitive in nature and may occur in the physical absence of the

phenomenon (Rogers, 2006).  This then leads the way forward for the learner to

test the abstract concepts in new situations (active experimentation or testing

stage) and creates an opportunity for the learner to modify subsequent

experiences; during this stage, Kolb (1984) suggests that information is changed

through extension, which involves direct interaction with the phenomenon. This

again leads to novel concrete experiences wherein the entire cycle begins anew.

In 1984 Kolb amended the 'Experiential Learning Model' to include concrete

experiences to test ideas and the use of feedback to change practices and

theories.

The concrete experience stage relates to "knowledge by acquaintance,"

practical experience, or apprehension (in Kolb's terms) and is less theoretical

than "knowledge about" something or comprehension which is represented by

the abstract conceptualisation stage (Atherton, 2005). This distinction is

exemplified in Figure 2 and highlights the two ways of understanding an

experience, namely abstract and concrete knowing.

**Two ways of knowing:**
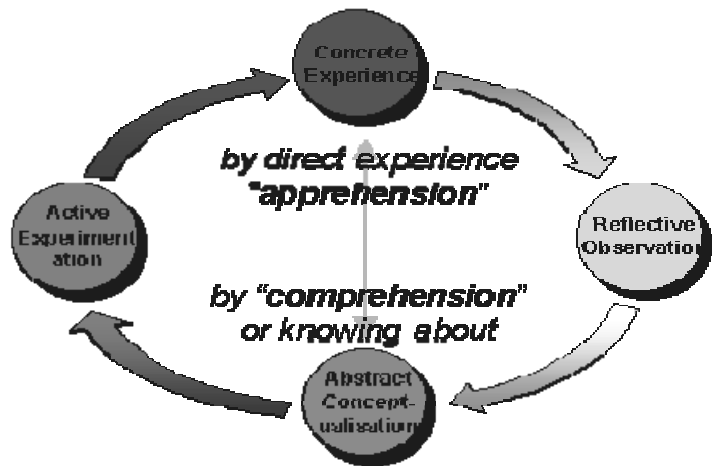
**Figure 2:  Experiential Learning Diagram. Apprehension and Comprehension.**
            **Atherton, J. S. (2005).**

Smith and Betts (2000) discussed the importance of reflection for moving

the learning from apprehension to comprehension in the 'Experiential Learning

Model'. This suggests that the quality of learning does not depend on the quality

of the experience alone, but also on the practice of reflecting on the learning

process and outcomes. Reflection gives attention to making meaning of the

experience through intentional effort which aids the learner to determine the

connotations of the experience. Active experimentation and practice then convert

the abstract conceptualisation into what the learners realizes as denotations

(Atherton, 2005), this exemplified in Figure 3.  Garrick (1999) defined learners in

the process of experiential learning as "apprehending experience, reasoning, or

logically thinking through their work experience and giving that experience

meaning" (p. 266).

Two ways of understanding or "transforming" knowledge

Concrete Experience

Active Experimentation

*by using* "denotation"

*by thinking* "connotation"

Reflective Observation

Abstract Concept-ualisation
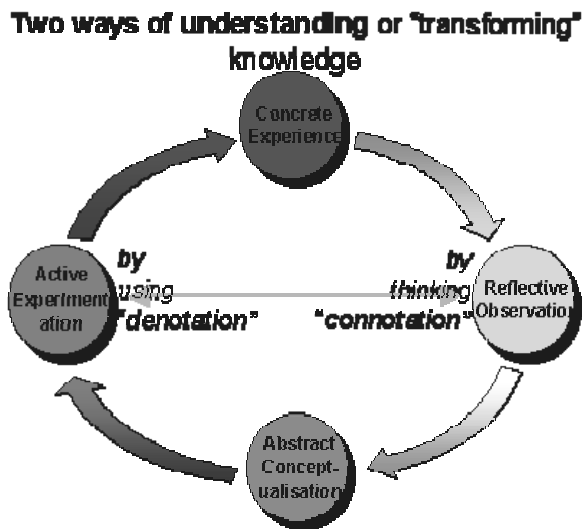
**Figure 3. Experiential Learning Diagram. Connotation and Denotation. Atherton, J. S. (2005).**

Attention is drawn to the third stage of the 'Experiential Learning Model' for its particular relevance to the context of co-operative education.  It is during the abstract conceptualization stage that the learner understands the principles of the experience that may be generalized and applied to diverse contexts, a concept that is particularly relevant to the transfer of learning and will be detailed in chapter three.  "Generalizing may involve actions over a range of circumstances to gain experience beyond the particular instance and suggest the general principle. Understanding the general principle does not imply, in this sequence, an ability to express the principle in a symbolic medium, that is, the ability to put it into words, it implies only the ability to see a connection between the actions and effects over a range of circumstances" (Coleman, 1976, p.

52). Thus, the ability of the learner to generalize during the abstract conceptualization stage of the experiential learning cycle must be *conceptually visualized* in order for the learning to result in an experience that may transfer to other contexts.

This overview of the 'Experiential Learning Model' and the cyclical stages of the learning process inform the forthcoming discussion of co-operative education and the co-op learning process.

## CO-OPERATIVE EDUCATION ORIGINS

The genesis of co-operative education began with Herman Schneider (1872-1939), an educator and researcher at Lehigh University in Pennsylvania at the beginning of the 20th century. During Schneider's term he conducted research with recent graduates and demonstrated that Lehigh graduates who had work experience prior to graduation were 1) able to grasp academic concepts better thus making them more work ready, and 2) that these students were more successful post graduation than their peers who had no work experience. These findings, along with Schneider's personal and academic experiences in architecture and engineering, his familiarity with industry, and role as an educator, led Schneider to conclude that the conventional classroom was inadequate in preparing technical students (Smollins, 1999) for work experiences post graduation.

Schneider found that the texts that students read and the labs that they participated in remained merely a theoretical concept without practical

application. Further, Schneider observed that academia alone could not teach the content pre-requisites for professional success and that certain skills could only be learned in the field of practice. As such, Schneider concluded that "students, who best grasped the subject matter of the course, also had practical (engineering) experience" (Cates and Jones, 1999, p. 13). It was not until students applied the theory to genuine problems in the work environment that the "students' thinking could then be directed along productive lines" (Cates and Jones, 1999, p. 13).

Envisioning a better method for linking academia and practice, Schneider aimed to connect the classroom to the workplace and in 1901 created the co-op model. Subsequently, in 1903 Schneider was selected for a faculty position at the University of Cincinnati and in 1906 was allowed an experimental year to develop the co-op program. As a result, Schneider, as a civil engineering professor at the University of Cincinnati, established the first North American co-op program in 1906.

The principles of experiential learning programs as described in the previous section by Furco (1996) are aligned with Schneider's goals for the 1906 co-op model. Schneider's goals for the co-op program were to:

- Enhance student learning and help them earn money to assist with the high cost of education. Given that students found it necessary to work while in school (as earning income would help to offset the cost of their program), Schneider sought to help students find jobs that were connected to their academic and career objectives;

- Allow for the practice of theoretical and academic knowledge in authentic and applied environments as a way to create motivation for learning. Authentic learning is the use of real world problems and situations that give students the opportunity to have realistic discussions in ways that were relevant to the student (Bransford, Brown, & Cocking, 1999);
- Help students make contacts and networks with industry which was important for graduates in their attempts to gain employment after graduation;
- Foster professional development in the workplace.

To achieve the goals of learning, access and networking, Schneider approached local businesses and discussed his ideas for integrating academic theory with practical experience in industry.  Business seemed eager to proceed, and the co-op model began to unfold with industry as an educational partner. The educational partnership is the crux in the co-op model to allow for the realization of the co-op goals and to support student learning.

The cohort design divided the academic classroom into two halves; one group participated in a work experience week while the other half remained in class, the students then switched groups. Following the work experience week students would meet outside of classroom hours to discuss the integration of academic and workplace learning concepts, examine the diverse contexts of academia and industry, and then return to work the following week. These sessions were facilitated by the academic instructor and included frequent discussions and reports to the class; the discussions were critical for deepening

the experience that occurred between the diverse contexts (school and non-school) of learning.

The focus of Schneider's model, while augmenting employability of students and supporting the economy (and making connections with industry), was on the learning that students engaged with during the course of their participation in co-op, fundamentally the co-op curriculum. An especially unique component of this co-op curriculum was the integration of the "co-op work experience objectives with the engineering course objectives, creating a single course of study that attempts to blend theory and practice in a seamless learning experience for the co-op student" (Johnston, 2007, p. 47). Schneider viewed the institution as responsible for providing students that were academically prepared to understand theory and had experience with the practical application of knowledge; this was done by providing students with methods to think and learn for themselves while employed on the job (Park, 1943). To continuously improve the co-op curriculum, Schneider worked closely with industry liaisons to discuss ideas about academic and industry connections and to carefully link classroom instruction with the input of educational partners from industry.

**CO-OPERATIVE EDUCATION AT SIMON FRASER UNIVERSITY**

The following sections describe in detail the Simon Fraser University (SFU) co-operative education program and curriculum. To begin, an overview of the SFU co-op program is presented along with a description of the SFU co-op model prior to a discussion of the SFU co-op curriculum. The discussion of the SFU co-op curriculum begins with an overview of the Provincial Co-op Bridging

Curriculum and reviews the customizations that adapted the Provincial Co-op Bridging Curriculum into the current SFU Co-op Preparatory Curriculum.  To close this section, the current SFU Co-op Preparatory Curriculum is described with a detailed focus on the current online version of this curriculum, the BOL course.

The co-operative education program was implemented in 1975 at SFU in Burnaby, British Columbia (B.C.), Canada.   Consistent with Schneider's co-op goals, the SFU co-op program aims to provide students with discipline-relevant work experiences to complement academic learning in order to enhance learning and prepare students for productive transitions to the world of work. SFU offers co-op as an optional educational program (with the exception of Engineering where co-op is mandatory) in all faculties. Approximately 2, 500 students (per year) are placed in accredited co-op positions around the world and SFU co-op is one of the largest and most diversified co-op programs in North America. The SFU co-op program develops academically relevant jobs, and these positions are supervised work experiences that are extended to students through traditional employment competition processes. Each co-op employer must meet the basic criteria of engaging the student in productive work (rather than merely observing), providing market appropriate remuneration for the work performed, and providing a work environment that aims to support the student's learning.

The implementation of the SFU co-op model differs from Schneider's original co-op model in that students alternate academic and work semesters (a semester is 4 months in length) versus alternative weeks. The typical application

of the SFU co-op model is for students to alternate an academic semester with a paid work semester; these work terms typically last four months, with the option for students to accept longer work terms (i.e.: eight months and in some cases, twelve consecutive months).

As the SFU co-op model differs from Schneider's original co-op model, the resulting co-op curriculum is not delivered within academic courses as it was in Schneider's classroom. Consequently, co-op syllabi are distinctive from academic syllabi and as such, a separate co-op curriculum has emerged. The next sections outline the SFU co-op model and curriculum.

**SFU Co-op Model**

The list below presents an overview of the SFU co-op model.

a) Students who are interested in the co-op program typically meet with a co-op co-ordinator to discuss their intent, personal, academic and professional objectives, and career goals in a face to face session either prior to or as part of an application to the co-op program.

b) Prior to undertaking a work term, co-op students must complete the co-op preparatory curriculum as defined by the Bridging Online (BOL) course and the co-op workshops series. The co-op preparatory curriculum is the syllabus "delivered to students in preparation for, and in support of, their work terms" (Johnston, 2007, p. 16), and is detailed in a later section.

c) While seeking a work term, students are assigned a co-op coordinator who offers unlimited one to one direct counselling in for example job search skills and with the development of career goals.

d) During the work term, general progress is supervised and monitored by the co-op employer and the co-op program through formal, informal, and student-directed inquiry. Additionally, during the work term, students receive support from their co-op coordinator and co-op employer to facilitate their learning (e.g.: students ask questions, receive feedback on their ideas, and seek advice and direction).

e) At the half way point of the work term, the achievement of the student's self-identified learning objectives are monitored by the co-op program through the mid-term check-in and the site-visit of the co-op coordinator to the student's workplace.

f) Upon completion of the work term, the student's performance and accomplishment of their self-identified learning objectives are evaluated by the co-op employer and the co-op program through the completion of a written work term report (for which each co-op program has specific requirements). The work term report creates an opportunity for students to reflect on their work term experiences, review their learning objectives and progress, discuss skill(s) acquisition and enhancement, think about their professional and career goals, and/or discuss how they met the co-op employer's goals.

g) At the conclusion of the work term, students are required to complete an evaluation of the work term position and supervisor as well as update their resume. Students may also be invited to debrief their work term experience with their co-op coordinator and other returning co-op students.

The successful completion of three co-op work terms over the duration of the academic program qualifies for a co-op certificate. With the successful completion of four work terms over the duration of their academic studies, students receive a co-op designation that is noted on their degree parchment. Through their participation in the co-op program, students accrue, at a minimum, one-year of professional work experience prior to graduation.

**SFU Co-op Curriculum**

This section aims to discuss the happenings that are most relevant to the formation of the current SFU Co-op Preparatory Curriculum. This section is not a complete historical overview of curriculum development at SFU (which has a long and remarkable history) and interested readers are directed to an article written by Johnston in 2003, and Johnston's 2007 dissertation for a more complete record. The focus here is on the SFU Co-op Preparatory Program, and more specifically the BOL course.

**Bridging Curriculum**

In 1997 and 1999, Johnston received grants from the B.C. Centre for Curriculum, Transfer and Technology to create a provincial series of face to face workshops that intended to serve as the curriculum for all B.C. co-op institutions.

The workshop series is called the Provincial Co-op Bridging Curriculum and is available to B.C. co-op practitioners in order to help them prepare students for co-op work placements. The Provincial Co-op Bridging Curriculum was an outcome of the research that Johnston conducted in 1996 for her Master's thesis wherein Johnston found that co-op students were more successful in securing work after graduation as well as progressing more successfully in those jobs than non-co-op students if "self-direction, skills acquisition, and transfer" (Johnston, 2003, p. 8) were explicitly practiced. Johnston's conclusions, aligned with the findings of Ricks, Cutt, Branton, Loken, and Van Gyn (1993), Schaafsma (1996), and Van Gyn (1996), suggested that the work experience in itself was insufficient to ensure transfer of learning and that students needed to know how to mobilize their learning. Furthermore, Johnston's findings were aligned with Ricks (1996) recommendations to ground co-op programs in well-established work-based learning principles such as self-direction, reflective practice, and transformative learning.

The goals of the Provincial Co-op Bridging Curriculum are multi-fold and best summarized as aiming to help "students better interrelate their school and workplace experiences by emphasizing the process of learning and practice that occur in both and by helping students take more control of their learning and work" (Brown, 1998, p. 6). The curriculum aims to help students and co-op practitioners see the "co-op experiences as a continuing learning process, not as a series of unrelated courses and work placements" (Brown, 1998, p. 7).

To achieve the Provincial Co-op Bridging Curriculum goals, the curriculum centred around a six-part conceptual framework. The six concepts were 1) self-directed learners, 2) transfer, 3) problem solving, 4) learners building knowledge for themselves, 5) the importance of the social context, and 6) assessment (Brown, 1998, p. 33). Of the six concepts, the focal point was self-direction as it is the foundation from which the other concepts develop; "the central element of becoming a self-directed learner is acquisition of the basic reflective and executive abilities of planning and assessment" (Brown, 1998, p. 11). Self-directed learners possess skills such as "subject knowledge (know the facts of a discipline), thinking strategies (know how to do things), metacognitive awareness (knows why and when to use skills), and motivation (is self-confident and willing)" (Brown, 1998). Also, self-directed learners do not work in isolation but rather are individuals in control of their surroundings and their roles in social and professional environments (Brown, 1998, p. 39). Research demonstrates that self-directed learners, among many other competencies, also have "the ability to apply what they have learned in different contexts" (Brown, 1998, p. 6). Thus, self-direction is crucial for the transfer of learning in that "students come to understand what they knew and could do, be able to effectively articulate what they knew and could do, and be able to mobilize their knowledge and skills across a variety of contexts" (Johnston, 2003, p. 9).

To help students grasp the six concepts, the Provincial Co-op Bridging Curriculum focused on the teaching of transferable skills. Four transferable skills, being 1) problem defining and problem solving, 2) planning and goal setting, 3)

interpersonal communication, and 4) assessment were used to provide students with a set of skills to assist them to understand how to use their existing knowledge and skills to better inter-relate their school and workplace learning.

The Provincial Co-op Bridging Curriculum goals are achieved by providing content, context, and activities for students to work through. Instructional strategies included asking students to describe and monitor their thinking processes and progress while developing their reflective (metacognitive) abilities in order to "permit students to transfer knowledge and skills from one context to another" (Brown, 1998, p. 6). Metacognition refers to 1) knowing the range of skills one is capable of using, [and] 2) knowing how to control when and why to use those skills (Brown, 1998). Furthermore, to achieve the curriculum goals, students built on their valuable prior experiences wherein special attention is paid to helping students mobilize their prior learning so that they can use their skills and knowledge beyond those contexts where they were learned (Johnston, 2003). Additionally, since students rarely made the connections between the social contexts of school and the workplace (Brown, 1998; Johnston, 2007), the curriculum stressed transfer as complex and difficult, particularly "because so many features of the two contexts are different" (Brown, 1998, p. 7). As such, the concept of the transfer of learning was taught through the four transferable skills in a conceptual (versus concrete) context that students could relate to and discuss. This approach to curriculum delivery aimed to make the concepts, goals, and skills required to succeed in the transition between school and non-school contexts more explicit to students. It can be suggested that that the

Provincial Co-op Bridging Curriculum explicitly teaches the thinking skills required for the conceptual transfer of learning.

In summary, "Bridging's roots are in the research on situated cognition, reflective practice, and transfer to support its constructivist design" (Johnston, 2003, p. 25). The focus of the Provincial Co-op Bridging Curriculum is "squarely on the student's thinking processes and how those play a critical role in preparing for co-op with respect to optimizing the transfer of learning across various contexts" (Johnston, 2003, p. 20). By focusing on transfer of learning across situations and making the concept explicit to students, the Provincial Co-op Bridging Curriculum takes into account the contextual nature of learning.

While the Provincial Co-op Bridging Curriculum aims to reduce the challenges students face with respect to transfer of learning, Brown (1998) recognized that even with its help, the tasks remain tough largely because "moving from abstract ideas to specific application is difficult" (Brown, 1998, p. 13). However, beyond informal and anecdotal reports, there is no empirical evidence that supports the aim of the Provincial Co-op Bridging Curriculum to assist with students' thinking processes in an aim to foster the transfer of learning.

**SFU Bridging Curriculum Workshop Series**

SFU co-op customized the Provincial Co-op Bridging Curriculum through two major transformations. This section describes the first major transformation wherein SFU co-op tailored the Provincial Co-op Bridging Curriculum into a

seven-part workshop series that was delivered over a total of fifteen hours,

herein referred to as the SFU Co-op Bridging Curriculum Workshop Series.

The SFU Co-op Bridging Curriculum Workshop Series intended to instruct

for the knowledge, ideas, and skills consistent with the Provincial Co-op Bridging

Curriculum's framework. The goals of the SFU Co-op Bridging Curriculum

Workshop Series included the continuing application and monitoring of the

curricular ideas from academic and workplace practice in conjunction with peers,

faculty, supervisors, and peers, this consistent with Brown's (1998)

recommendations. However, the SFU Co-op Bridging Curriculum Workshop

Series "was designed to be highly interactive and to be facilitated versus

presented, with much of the content emerging from the class/group interactions"

(Johnston, 2003, p. 9). This facilitated delivery highlighted the changed historical

roles of the co-op program coordinator and co-op student from the co-ordinator

setting the rules to a more collective approach wherein the two roles worked

together to achieve the learning objectives of the curriculum; in other words,

student learning and student needs drive the curriculum. This was also

consistent with Brown's recommendations (1998), and the "main thrust was to

help students learn to take control of their own learning [by becoming] more

responsible for the planning, execution, and assessment of their classroom and

work place performance" (Brown, 1998, p. 8). The co-op coordinator served as a

guide to connect students with the co-op curriculum goals and infuse the ideas

throughout the student's progress in the co-op program.

The SFU Co-op Bridging Curriculum Workshop Series syllabus is presented in Table 1.

**Table 1. SFU Co-op Bridging Curriculum Workshop Series Syllabus**

Part 1: Introduction
- The Co-op Bridging Curriculum is for you
- What is a self-directed person?
- Your portfolio will help you plan and monitor your progress

Part 2: A review of the Bridging Curriculum and how to use it
- Recent ideas on how people learn and use knowledge
- Starting with four skills
- Transferring what you learn to new contexts can be difficult
- How to become a self-directed learner and worker

Part 3: Four transferable skills
- Problem defining and solving
- Planning and goal setting
- Interpersonal communication
- Assessment and feedback

Part 4: Portfolios: assembling your record of learning and work
- Types of portfolios
- Using a learning portfolio
- What to put in your portfolio
- The work term report: an important learning and portfolio opportunity

A review of the above syllabus revealed that career tools such as the cover letter, resume, and interview, although foundational to the curriculum, are not the focal point of the SFU Co-op Bridging Curriculum Workshop Series. While many general employment courses and curriculum in other national co-op programs, as well as previous iterations of the SFU co-op curriculum focused mostly on specific activities deemed necessary to develop the career tools for work placement, the SFU Co-op Bridging Curriculum Workshop Series embedded the development of these career tools within the practice of concepts

such as self-direction, deconstructing thinking, and reflection on practice (Johnston, 2003). For example, the resume and cover letter are situated in the transferable skills section of the SFU Co-op Bridging Curriculum Workshop Series and students create these through critical thinking around interpersonal communication in order to understand how to develop the content of the career tools. This strategy intended to provide students with the skills to learn, apply, develop and move the creation of career tools from one situation to another which also supports students' understanding about the transfer of learning and as such, their applications to diverse work placements. This illustrates a shift in pedagogy and movement of projects into the "larger framework of metacognitive development" (Johnston, 2002, p. 5). Another example is demonstrated in the Interview Debrief Form which reiterates the importance of metacognition (that was learned in an earlier portion of the workshop) in facilitating the transfer of learning to future contexts. The form encourages students to reflect on the interview experience and generate some generalizable considerations for application in future performances; this is consistent with the third stage of Kolb's 'Experiential Learning Model' and is critical in fostering the transfer of learning.

The model of learning in the SFU Co-op Bridging Curriculum Workshop Series did however differ in design from Kolb's 'Experiential Learning Model.' Kolb's model was primarily aimed at explaining learning from experience through individual and cognitive perspectives and as such doesn't take into account different cultural experiences and conditions (Anderson, 1988). There is a need to expand on Kolb's 'Experiential Learning Model' and discuss the context

inherent in building knowledge. The SFU Co-op Bridging Curriculum Workshop Series recognized this need and as such, was based on the perspective that learning is situated (bound in social and contextual environments) and "attempted to help students see the shared generalized principles that are foundational to their context-bound learning" (Johnston, 2003, p. 9). In the SFU Co-op Bridging Curriculum Workshop Series, students were made aware of how they learn and what conditions support their ability to mobilize that learning across situations. For example, when students created the resume, they worked to deconstruct their skills and tasks into foundational skills that they considered most likely to transfer (with respect to generalizable concepts as learned in an earlier portion of the workshop) and thus understood these skills as influenced by the context of first acquisition and transferable to novel contexts. The SFU Co-op Bridging Curriculum Workshop Series "encourages a student to look both inward and outward so as to contextualize their experiences within a social framework and construct their understandings in context" (Johnston, 2003, p. 21).

The limitation in Kolb's 'Experiential Learning Model' exemplified the need to attend to both cognitive and situated perspectives of the transfer of learning and recognizes transfer as a complex process in the co-op context since learning occurs in multifaceted and interdisciplinary environments. The cognitive and situated perspectives and the impact on the transfer of learning are discussed in chapter three.

**Current Version of the SFU Co-op Preparatory Curriculum**

The above section described the first major customization of the Provincial Co-op Bridging Curriculum into the SFU Co-op Bridging Curriculum Workshop Series. This section describes the second customization, wherein the SFU Co-op Bridging Curriculum Workshop Series subsequently transformed to the current SFU Co-op Preparatory Curriculum.

By 2000 the demand from students to participate in the SFU co-op program was increasing and the face to face delivery of the SFU Co-op Bridging Curriculum Workshop Series was not sustainable. To improve access to the curriculum, while retaining the goals of the SFU Co-op Bridging Curriculum Workshop Series, in 2002 the curriculum was expanded into the current SFU Co-op Preparatory Curriculum. The delivery of the curriculum was re-designed to include both online and face to face components in an aim to provide students with the knowledge, skills, and tools they required for workplace preparation, learning and success.

As outlined in Table 2, four components comprise the current SFU Co-op Preparatory Curriculum, these are:

1) one to one counselling

2) Bridging Online (BOL) courses

3) workshops

4) Online Learning Community

**Table 2. Current SFU Co-op Preparatory Curriculum**

| One to One Counselling | BOL Courses | Workshops | Online Learning Community |
|---|---|---|---|
| Students are assigned a co-op coordinator to support them during the job seeking semester, prior to a transition to the workplace, during the work term, and to debrief after the work term as they return to campus.<br><br>Students discuss intent, personal and professional objectives, and career goals with a co-op advisor.<br><br>Students receive support in job searches, with the transfer of learning and professional and career goal setting, and achievements. | BOL I<br><br>A. Skills Transfer learning module. The topics include:<br><br>a) Skills versus Tasks<br>b) Near and Far Transfer<br>c) Components of a Skill<br>d) Metacognition<br>e) Enhancing Skills Transfer<br><br>B. Effective Communication learning module. The topics include:<br><br>1. Active Listening and Feedback<br>2. Employment Related Communication Tools<br>    a. The Cover Letter<br>    b. The Resume<br>    c. Effective Interviewing<br>BOL II<br><br>A. Personal Management learning module. The topics include:<br><br>a) Self-Assessment<br>b) Self-Direction<br>c) The Portfolio<br><br>B. Workplace 101 learning module. The topics include:<br><br>a) First Week on the Job<br>b) Workplace Etiquette<br>c) Rights and Responsibilities<br>d) Ethics<br>e) Teams in the Workplace | The workshops intend to complement the BOL courses by fostering high-level skill development and critical thinking with respect to the development of career tools.<br><br>Core workshops:<br><br>a) Resume<br>b) Cover letter<br>c) Interview Skills<br><br>Supplementary:<br><br>a) Transition to the Workplace<br>b) Self-Directed Work Terms<br>c) Resume Make Over<br>d) Reflexive Writing | This online community of practice aims to allow students, staff, educators, alumni, and employers to connect on issues about personal and professional experiences related to careers, personal and professional development, and experiential learning.<br><br>Features include:<br><br>Discussions<br><br>Self-directed learning modules and articles (interview types, portfolios, work world trends, international)<br><br>Profiles of other students in diverse jobs and disciplines<br><br>Web Links, resources, and reputable employability-related sites<br><br>Searchable Interview Questions Database |

As the purpose of this study was to explore the opportunities for the transfer of learning of co-op students who had participated in the BOL course, a detailed description of BOL is presented below.

**SFU Co-op Bridging Online**

Bridging Online (BOL) is comprised of two courses, BOL I and BOL II.

**BOL I**

The objective of the BOL I course is to help students use what they have learned in prior experiences (i.e.: academic, volunteer, work, personal, etc.) effectively in the workplace. It is hoped that students learn to think about their skills, knowledge, and abilities as being transferable and will be able to consider how their skills apply in various contexts. Whereas many employment-oriented programs focus on the tools necessary for employment success such as the resume, cover letter, and interview, BOL I intends to help students critically focus on how the content of those tools is learned, applied, and moved from one situation to another. The BOL I course has two main learning modules, Skills Transfer and Effective Communication.

The Skills Transfer learning module has the following topics:

a) Skills versus Tasks
b) Near and Far Transfer
c) Components of a Skill
d) Metacognition
e) Enhancing Skills Transfer

The Effective Communication learning module has the following topics:

a) Active Listening and Feedback
b) Employment Related Communication Tools
    i. The Cover Letter
    ii. The Resume
    iii. Effective Interviewing

**BOL II**

The objective of the BOL II course is to help students see how all their experiences both formal and informal can contribute to their learning and enhance their performance as they transition between school and non-school contexts. The BOL II course has two main learning modules, Personal Management and Workplace 101.

The Personal Management learning module has the following topics:

a) Self-Assessment
b) Self-Direction
c) The Portfolio

The Workplace 101 learning module has the following topics:

a) First Week on the Job
b) Workplace Etiquette
c) Rights and Responsibilities
d) Ethics
e) Teams in the Workplace

**Delivery**

Each BOL course is a two-week session that is delivered through WebCT at SFU (http://webct.sfu.ca). The BOL course is facilitated by:

1) two BOL course facilitators (also co-op program coordinators) who instruct

students, assist them with content acquisition, and guide the discussions, and

2) one co-op employer expert who is an industry professional or a SFU co-op

alumni and is invited by the co-op program to provide an employability-oriented

perspective to the discussions in order to guide students' acquisition and use of

the course materials in an employment (or career) context.

**Instructional Design**

      The instructional design of the BOL course allows students to study and

discuss the learning modules in the course at a self-directed pace over the two-

week duration of the course. The learning modules have specific topics, as

outlined in the previous section, and each topic contains a specific learning

objective (see Appendix B) and related reflection exercise that students are

required to respond to and discuss (see Appendix C). To complete the reflection

exercises, students post their responses in the WebCT discussions forums, and

discuss their ideas with their peers, the BOL course facilitator and the co-op

employer expert. The reflection exercises intend to engage students in social

interactions and critical thinking as they share personal experiences and reflect

on what they are learning throughout the course; importantly students are asked

to comment on and build on the ideas of their peers. Additionally, the discussions

leave room for emergent dialogue and exploration of other topics should students

choose to venture in new directions, pose thoughts, or question one another.

The intent is to get students to participate actively and collectively as they

improve all their ideas and share experiences around pre-employment preparation, skills transfer, and personal and professional career development.

In summary, the epistemology of BOL is based on a constructivist theory. The approach supports learning by invoking prior knowledge and experiences, and encourages reflection on those experiences. Additionally, student explore multiple perspectives as they progress through conceptually-based authentic activities, construct their own understandings of the concepts presented in the learning modules, and integrate the new thinking into their pre-existing intellectual constructs.

**Discussions**

The three discussion forums in BOL are detailed in Table 3.

Table 3. BOL Discussions Forums

| |
|---|
| **Peer to Peer Discussion Forum** |
| During the BOL course students come here to post responses to the reflection exercises and interact with their peers. |
| |
| **Ask an Expert Discussion Forum** |
| Students may take advantage of this discussion forum to connect directly with a co-op employer expert. Students are encouraged to take this opportunity to access opinions and learn about what is going on in the current world of work. |
| |
| **Facilitator's Office Discussion Forum** |
| Students go here to post their responses to the icebreaker, ask any questions, or pose comments for their BOL course facilitators. Students may also ask any questions regarding co-op or other issues. |
| |
| The discussion forums are open to all registered students in the course and therefore are not confidential. For confidential correspondence, students are invited to privately email the BOL course facilitator. |

**BOL Course Facilitator**

The role of the BOL course facilitator is to relinquish authority and serve as a facilitator or coach that guides students through the necessary thinking processes as they work through the learning modules to acquire the course concepts. The BOL course facilitator provides reminders to invoke relevant prior knowledge, assists with focusing the learning, elicits performance from students, promotes interactivity, summarizes the discussions, interprets any problems, resolves disputes with the course content, and prompts students to use the resources available to them through BOL and co-op. The BOL course facilitator also provides corrective feedback and assessment in order to prevent the fossilization of errors in thinking.

**BOL Co-op Employer Expert**

The role of the co-op employer expert in BOL is to:

- challenge students to "think outside the box" by posting interesting and current topics/ questions,
- convey relevant job and career related information to students,
- keep the discussion focused,
- promote participation by inviting contributions,
- act as an intervener (e.g. re-direct students that are off track), and
- respond to questions posed by students.

**BOL Training**

Both the BOL course facilitator and co-op employer expert are required to participate in a training course prior to assuming their role in the BOL course. Facilitators and experts are required to complete the SFU WIL Training Online

Facilitators (TOF) course which is a comprehensive training guide intended for those new to online learning and online teaching within the WIL unit. Part of the comprehensive objectives of the two-week online TOF course is to assist those new to online facilitation with their acquisition of competencies related to the online facilitation of BOL. Through readings, discussions, personal reflections, and collective learning, each TOF participant will work to build an understanding of WIL philosophy, co-op and adult learning theory, and online communication. The TOF course intends to help new facilitators develop identities in a novel role and also provides strategies for capitalizing on the unique learning and teaching experiences of the participants as they transform into the role of an online facilitator. Finally, TOF gives participants the experience of being an online learner, which is a targeted method that aims to foster appreciation for the online learning experiences of students.

Following the TOF course, the facilitators and experts are placed into a "live" BOL course which gives them an opportunity to review the BOL course content and shadow experienced facilitators. Through this opportunity, the participants may put the theoretical concepts of the TOF course into practice. The TOF participants are also invited to a face to face TOF debrief session where they meet their course peers, discuss topics related to course facilitation, and seek clarifications from the TOF course facilitator. Furthermore, the BOL course facilitator and co-op employer expert are continually supported in their role through access to online materials directly related to facilitation and BOL as well as direct consultative access to the WIL Curriculum Manager.

**Assessment**

There is no final examination of students at the conclusion of the BOL course. Assessment of learning occurs throughout the BOL course as students' acquisition of the course content and engagement in the discussions is monitored and guided by the BOL course facilitators throughout the duration of the course. As such, each student is assigned a pass or fail score based on their level of participation.  Table 4 outlines the BOL assessment criteria.

Table 4. BOL Assessment Criteria

| |
|---|
| Some general guidelines for satisfactory completion of BOL. The student:<br>▪ is active, timely, and contributes regular postings to the discussions,<br>▪ clearly engages the course content and addresses most of the reflection exercises,<br>▪ draws upon prior experiences and provides examples to analyze ideas,<br>▪ identifies and explains connections between own and other students' experiences, and<br>▪ invites and encourages the participation of others and makes critical comments on others' ideas while building on the ideas of others and bringing new ideas to the discussion. |

**Summary of Co-operative Education and BOL**

Chapter two began with an overview of the relevant literature that informs understandings about experiential learning and the nature of learning in co-op. The chapter then gave a historical review of the origins of co-operative education, which was critical for understanding the SFU co-op model and goals. To conclude, this chapter detailed the current SFU Co-op Preparatory Curriculum and BOL course in order to lay the groundwork for the specific aspect of the BOL course that will be explored in this study.

Given that the purpose of this study is to explore the opportunities for transfer of learning in the BOL course, a review of the literature and research on the transfer of learning as it relates to co-op, curriculum, and instruction are presented in the next chapter. The transfer of learning literature and research will then be analyzed against the BOL curriculum to formulate the narrowed context of this study.

# CHAPTER THREE: TRANSFER OF LEARNING: THE LITERATURE AS IT RELATES TO CO-OP, CURRICULUM, AND INSTRUCTION

Chapter three is a review of the literature on the transfer of learning as it relates to co-op, curriculum, and instruction.  Chapter three begins with a sampling of the transfer of learning terminology, moves to a review of the major constructs used in the field, and discusses conditions and instructional strategies that foster the transfer of learning.   These understandings about the transfer of learning are then summarized and reviewed against the BOL course to specify those aspects of the BOL course that address the thinking skills that are consistent with what is understood to support the transfer of learning.

## Definition and Terminology

The basic definition of the transfer of learning is the extent to which the knowledge and skills that are learned in one context or with one set of tasks or situations applies to, or impacts, the learning or performance in a different context, or with other related tasks or situations (amalgamated from many sources including Fogarty, Perkins, & Barrell, 1992; Gagne, Yekovich, & Yekovich, 1993).  The 'learning' within transfer of learning is a broad term and encompasses "not only specific skills, but also socio-cultural, cognitive, and behavioural characteristics" (Leberman, McDonald, Doyle, 2006, p. 2). Transfer of learning may occur in everything we do in our lives as prior learning is

constantly being transferred towards the development of new skills and knowledge. Transfer of learning not only looks at the impact of prior skills and knowledge on performance in new contexts but also explains how we become familiar with routine patterns, learn to distinguish regular situations, and are able to select appropriate processes for accomplishing our goals. While no definitive distinction can be drawn between transfer of learning and ordinary learning, the gray area indicates that with the transfer of learning, the learner can display the learning at a later time even if the situations aren't very similar (Perkins, 1992). Thus, transfer of learning is not concerned with nearly identical situations but rather with the application of behaviours in visibly different situations (Detterman and Sternberg, 1993; Perkins and Salomon, 1996).

In the absence of transfer of learning, we would begin the learning process anew in each situation and be left to make new meaning about each new experience. Our existing skills, knowledge, and abilities would not affect our learning or performance in new situations. With that in mind, some situations arise where no precedent exists. We must adjust and learn a new skill or way of thinking that is specific to the situation, while concurrently aiming to bring forth any past experiences that may bear relevance to the new situation. In such instances, prior knowledge may obstruct/ impede *(negative transfer)* or enhance/ facilitate *(positive transfer)* our performance in the new situation (Cormier and Hagman, 1987; Marini and Genereux, 1995). Negative transfer is problematic for educators but it typically occurs only during the initial phases of learning in a new domain (Perkins, 1992).

There are over twenty distinct types of transfer identified in the literature however, for the purposes of this study only a handful of the most relevant distinctions are reviewed. The most commonly discussed contrast is between near transfer (closely correlated contexts) and far transfer (different contexts), this is also the second topic in the Skills Transfer learning module in BOL I. Typically when two situations appear similar, it is more likely that learning from one situation will be transferred to a new situation and this is known as near transfer. However, transfer of learning also occurs across contexts that do not appear related, this known as far transfer. The research shows that most learners need assistance to enhance that type of transfer (Detterman and Sternberg, 1993). Before going into more detail about near and far transfer, another relevant distinction is between simple and complex transfer. Simple transfer requires minimal to zero effort to apply learning from one situation to another, whereas complex transfer requires a higher level of cognitive processing.

Near transfer of skills and knowledge suggests that skills and knowledge are applied the same way every time the skills and knowledge are used. Near transfer usually involves procedural tasks that are typically applied in the same order; "near transfer is to situations that are identical except for a few important differences" (Detterman and Sternberg, 1993, p. 4). The advantage of this is that skills and knowledge are more readily transferable and learning is usually acknowledged as a success. The disadvantage of near transfer of tasks is that if the circumstances change, the learner may be less likely to adapt their skills and

knowledge, thus transfer does not occur. An example of near transfer would be a person who knows how to drive a car who then is typically able to transfer their existing skills to learn how to drive a bus as the two situations are fairly similar.

Far transfer involves skills and knowledge being applied in situations that appear more different. Far transfer occurs when learners move a set of skills between seemingly unrelated contexts. Far transfer is required when the learner's perception of the contexts appear to be remote from each other (as is often the case between school and work). In these situations, learners may be less likely to recognize the transferable foundational skills immediately, and are therefore less likely to naturally mobilize them effectively to their advantage. An example of far transfer may be a student, who has learned the principles of wind flow to design a windmill, must now transfer that knowledge to direct the sail on a sailboat. If the student recognizes the two situations as similar, thus making the transfer appear near for him, the student will be more readily able to transfer his learning. If not, transfer is unlikely to occur and the problem solving is unaided by the student's previous learning about wind flow. The Near versus Far Transfer topic in the Skills Transfer learning module of BOL I aims to instruct on the distinction between near versus far transfer and the Enhancing Skills Transfer topic and Components of a Skills topic in the Skills Transfer learning module of BOL I discusses how problem solving and gap analysis foster transfer, particularly in far transfer situations.

The distinctions between near and far transfer are not precise and are broad characterizations (Perkins, 1992). "Transfer can be conceptualized as a

continuum of situations progressively more different from the original learning experience" (Detterman and Sternberg, 1993, p 5). To further muddy the definitions, another level of transfer is one that may occur on the subconscious level. If the transfer contexts are sufficiently similar such as in near transfer then any subtle differences may be sufficiently dealt with at a subconscious level thus rendering them as reflexive. This is often the case when a learner applies the same skills in different contexts, a concept that is highlighted in the Skill versus Tasks topic in the Skills Transfer learning module of BOL I.

Other terminology important to the discussion of transfer of learning is specific and nonspecific transfer. Specific transfer means that the learner transfers the contents of learning to novel contexts. Nonspecific transfer includes techniques such as "how to use strategies, how to break up practice, or how to maintain motivation" (Detterman and Sternberg, 1993, p 5) that were not learned in context. These general skills transfer in a nonspecific way, and are also referred to as general transfer. The Skills versus Tasks topic in the Skills Transfer learning module of BOL I aims to help students break up their experiences and tasks into the component sub-skills in order to understand the contents of the experience that are transferable. Furthermore, in the Enhancing Skills Transfer topic and Metacognition topic in the Skills Transfer learning module of BOL I, students are asked to generate strategies that assist with the transfer of learning by drawing on generalizeable principles from these situations that would be applicable to novel contexts.

Finally, deep structure and surface structures of situations are used when discussing transfer of learning. The difference between the two is in the physical appearance (surface) versus the functional (deep) capacity. For example, Detterman and Sternberg (1993) give the example of dials on different models of car dashboards wherein the deep structures are the same but the surface structures differ.

The Skills Transfer learning module in BOL I also stresses skills transfer rather than transferable skills.  In using the term transferable skills, the skills are viewed as separate from the learner and distinct from the situation in which they were acquired whereas skills transfer recognizes the importance of situated learning that is bound in social and contextual environments.  Transferable skills by the nature of its definition would be devoid of context and these skills would then be rarely employed by the learners. The assumption here is that transferable skills (skills learned in a situation and employed in another situation) are a set of skills or competencies that are separate from the learner and the situation, thus the relationships between how the learner constructed meaning with that skill is void and would severely impact the performance with that skill.

In conclusion, the study of the transfer of learning focuses predominantly on the far and/or general skills transfer of deep structures rather than near transfer of surface structures. Having said that, far and deep structure transfer is the most difficult to achieve and as such, this concept is taught explicitly to learners throughout BOL I and more specifically in the Near versus Far Transfer topic in the Skills Transfer learning module of BOL I.

**Transfer Findings**

The research findings along with the field of transfer of learning have endured considerable discussion and debate. There are a wide range of outcomes with Detterman and Sternberg (1993) suggesting that transfer rarely occurs, to Hammer, Elby, Scherr, and Redish (2005) who are more amenable to the concept of transfer, while some researchers such as Dyson (1999) believe that transfer is ubiquitous. The following is a short review of a small sample of important research findings from the history on the transfer of learning. The goal was to establish some key outcomes as they impact the instructional strategies and conditions that foster the transfer of learning which are discussed in an upcoming section.

The two main camps are the believers and non-believers. Among the believers is Santanaya (1982) who found that humans have the ability to use prior experiences to their advantage in new situations. That is, humans benefit from the transfer of knowledge thus implying that transfer is an "important human capability" (Santanaya, 1982, p. 2). Conversely, Hegel (1982) believed that humans don't transfer what they learn to new situations. To concur, Detterman and Sternberg (1993) reported that, "unfortunately, most of the history of transfer confirms Hegel's remark that we seldom learn anything from history" (p 5).

Classical and historical studies on the transfer of learning began with Thorndike, an educational psychologist, who studied transfer for nearly a quarter of a century. Thorndike concluded that the study of Latin, which was thought to discipline the mind did not advantage study in other academic subjects.  Further,

Thorndike and Woodworth's (1901) findings indicated that transfer was not common and if it occurred, it was between situations that were very similar. Thorndike and Woodworth coined these findings as the 'Common Elements Theory,' which stated that previous learning can facilitate new learning based on the fact that the new learning context has elements identical to those of the prior learning context. This suggested that transfer can be predicted based on the "proportion of common elements shared by two situations" (Detterman and Sternberg, 1993, p 7).

Thorndike concluded that transfer is quite rare and the possibility of its occurrence is directly dependent on the similarity of two situations. These findings were replicated by other researchers, thus lending support for the 'Common Elements Theory'. For example, it was thought that students who learned LOGO may be able to transfer the mental discipline of problem solving to other areas, but studies failed to show positive results (Cognition and Technology Group at Vanderbilt, 1996). Further, Scribner and Cole (1981) studied literacy in an African tribe and found that literacy was impacted by immersion in activities and not through acquisition of reading and writing skills. Finally, Simon and Hayes (1976) also favored Thorndike's outcomes and demonstrated negative transfer results in transfer effects between games (tower of Hanoi) that were isomorphs of each other; subjects did not transfer strategies learned in one game to another and only did so if the relationships between the two games were made explicit (through guiding, mediation, and facilitation) to the learners.

Differing perspectives on the 'Common Elements Theory' exist, some refuting the value of the theory. The 'Common Elements Theory' "excluded consideration of any learner characteristics including when attention was directed, whether relevant principles were extrapolated, problem solving, or creativity and motivation. The primary emphasis was on drill and practice" (Bransford, Brown, & Cocking, 1999, p. 2). As such, Bransford and Schwartz (1999) suggested that transfer should not be defined in terms of common elements, rather transfer should be perceived of as preparation for future learning. Bereiter (1995) also did not look at the potential for transfer in what is learned, but rather thought of transfer of learning as an ability or a disposition within the learner. Bereiter (1995) argued for teaching wherein learners would think through situations versus the reproduction of what would be the common elements of learning.

Since the early work of Thorndike, many researchers have conducted reviews on the transfer of learning. As Detterman and Sternberg (1993) stated, the reviewers are in "almost total agreement that little transfer occurs" (p 8). A study by Baldwin and Ford (1988), which reviewed all the articles on transfer of training in the workplace, resulted in outcomes that demonstrated that not more than 10% of training transfers to the job even in near and specific transfer situations. In 1989, Singley and Anderson reviewed empirical and theoretical literature with respect to individual differences in transfer of learning and the findings showed evidence only for near transfer where cognitive elements between tasks were shared. "There has been no positive evidence of general

transfer besides a few highly questionable studies" (Singley and Anderson, 1989,

p. 25). Extensive studies of general transfer have been conducted by

researchers such as Judd (1908), Woodrow (1927), Gick and Holyoak (1980),

Reed, Ernst and Banerji (1974), and Novick (1990) and each study presented

equivalent outcomes being that, even with a large extent of similarity between

two problems, subjects failed to realize that the "two situations are identical and

require the same solution" (Detterman and Sternberg, 1993, p. 13) and may only

see the similarly if explicitly told.

Berryman and Bailey (1992) concluded from the research in the field of

transfer of learning which has spanned decades that "individuals do not

predictably transfer knowledge, they do not predictably transfer school

knowledge to everyday practice. They do not predictably transfer sound everyday

practice to school endeavours even when the former seems clearly relevant to

the latter" (p. 40).  As a result, Billet (1998) suggested that for transfer to improve

between school and workplaces, learners required guided instruction to embed

knowledge, thus making the transfer as near as possible.  It can be suggested

that if learners are to successfully transfer their learning, they need to be

explicitly told to do so and this may occur via hints, suggestions, and tricks to

draw attention to the potential for transfer. This practice is employed in the BOL

course wherein the curriculum aims to reduce the challenges students face with

respect to the transfer of learning.

Given all the negative press on the transfer of learning, it is important to

discuss that some positive findings have surfaced in the literature. Clements and

Gullo (1984), and Lehrer, Buckenberg, and Sancilio (1989) found that computer

programming training (LOGO from Papert, 1980) did show positive transfer

effects by way of learners demonstrating divergent thinking abilities in other

tasks. Salomon, Globerson, and Guterman (1989) similarly showed that

computer programming training transferred to strategic reading and writing

abilities which suggests that the ability to monitor and direct one's learning are

the transferable capabilities.

Based on the overview of the research findings presented above, there is

more consensus that neither "specific nor general skills will automatically transfer

to a new situation" (Detterman and Sternberg, 1993, p 15). The existing research

on transfer states that transfer of learning does not occur often, and far transfer is

rarer (Perkins, 1992) as it requires deeper analysis, conscious thought, and

mindful transfer. In conclusion, transfer of learning is not a passive, naturally

occurring phenomenon (Stokes and Baer, 1977).   Given these outcomes, the

next section discusses some conditions that are thought to be required in the

learning environment to foster the best potential for the transfer of learning.

**Conditions**

Transfer of learning is an assumption that educators make trusting that all

learning is retained over a time period and will be used in appropriate situations

(Ripple and Drinkwater, 1982). As the research findings indicated, this is not

often the case. Furthermore, "conventional educational practices often fail to

establish the conditions either for reflexive or mindful transfer. However,

education can be designed to honor these conditions and achieve transfer"
(Perkins, 1992, p. 1).

Based on the research findings presented above, five teaching conditions
thought necessary to foster the transfer of learning were discussed by Perkins
(1992). The five conditions are: 1) practice, 2) explicit abstraction, 3) active self-
monitoring, 4) arousing mindfulness, and 5) using a metaphor or analogy
(Perkins, 1992). *Practice* depends on the extent and performance of skills,
knowledge, abilities in diverse contexts to yield flexibility and a "relatively
automatized bundle of skills easily evoked in new situations" (Perkins, 1992, p.
5). *Explicit abstraction* is the abstraction and generalization of principles learned
in one situation and the application of these principles to another situation. *Active
self-monitoring* involves metacognitive reflection on thinking processes; this is
different from explicit abstraction in that self-monitoring is a focus on thinking
processes rather than the structure of the situation (Perkins, 1992). *Arousing
mindfulness* is a generalized state of alertness to the situations and surroundings
that one is engaged with and contrasts with passive, automatic cognition
(Perkins, 1992).  Finally *using a metaphor or analogy* facilitates transfer in that
new materials are studied and analogies or metaphors are based on previously
learned materials (Perkins, 1992). "Things known about the 'old' domain of
knowledge can now be transferred to a 'new' domain thereby making it better
understood and learned" (Perkin, 1992, p. 6).

Despite an understanding and provision of the conditions that encourage
transfer, some learners accomplish transfer tasks while others do not. In

response to this issue, Salomon and Perkins (1988) offered the 'Low-Road Theory' and 'High-Road Theory' on the transfer of learning, both prolific theories that examine the mechanisms of transfer, essentially the psychological paths by which transfer occurs. The 'Low-Road Theory' of transfer of learning is the development of knowledge and skills that are highly automatic and require practice in multiple contexts. Fogarty, Perkins, and Barell (1992) stated that "low-road transfer occurs when similarities between a new situation and an old one 'trigger' the application of old knowledge and skills" (p. xiv). It is the initial learning schemas that become responsive to affordances (action opportunities) in the learning situation (Perkins, 1992). Therefore, the transfer situation has potential if it presents similar affordances that are recognized by the learner and result in the actions being applied to the new situation. Low-road transfer is largely reflexive and appears in near transfer situations.

The 'High-Road Theory' of transfer is thought to involve cognition and understanding as well as purposeful, mindful and conscious analysis. Fogarty et al. (1992) stated that "high-road transfer occurs when a person mindfully abstracts characteristics from an old situation and applies them to a new one, [through] a reflective rather than a reflexive process" (p. xiv) and there is an active search for connections (Perkins, 1992).  Far transfer is thought to occur through the mechanism of high-road transfer where there is a purposeful search for connections and the learner may ask himself "What is the general pattern? What is needed? What principles might apply? What is known that might help?" (Perkins, 1992, p. 7). "High-road transfer occurs through mindful abstraction or

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decontextualization of knowledge or skills for application in another context; it is a thoughtful, effort-demanding process, intellectual in character" (Fogarty et al., 1992, p 63). High-road transfer can be used to explain far transfer and bridging between apparently remote contexts (Perkins, 1992). For instance, time management strategies learned in a workplace education program might be drawn upon to solve new problems around task-time allocations on the shop floor (Human Resources and Skill Development Canada, 2005). It can be suggested that the learning objectives of the Skills Transfer learning module in BOL I are aligned with the 'High-Road Theory'. The BOL I course encourages the conceptual and non-experiential application of thinking skills for the transfer of learning in a situated context and depends on the learner's ability to make abstractions from the contexts of acquisition in a deliberate search for connections between prior contexts and novel ones.

The low-road and high-road perspectives recognize what is understood about transfer and the conditions that are thought to support transfer of learning. The theories acknowledge that transfer may be driven by reflexive (low-road) responses to stimulus conditioning where prior contexts may act as triggers and where practice affects performance. Conversely, the abstract and complex nature of far and general transfer is recognized in the high-road theory.

Given that these conditions that are thought to foster the transfer of learning, a close examination of the instructional strategies that are thought to support the conditions for the transfer of learning are considered in an upcoming section. First however, different perspectives on the transfer of learning are

reviewed below since "the development of educational interventions should be informed by the growing bodies of research in cognitive and social science" (Anderson, Greeno, Reder, Simon, 2000, p. 6).

## PERSPECTIVES ON THE TRANSFER OF LEARNING

As noted in chapter two, it can be said that Kolb's 'Experiential Learning Model' is heavily weighted in human cognition and as such, refers to thought processes, how the brain thinks and processes information, as well as how knowledge is applied. The model is primarily aimed at explaining learning from experience through individual and cognitive perspectives and as such doesn't take into account different cultural experiences and conditions (Anderson, 1988). As learned from the findings in the transfer of learning literature review, transfer of learning is not dependent only on mental representations (cognitive schemas), but also occurs in response to triggers in a learning situation (Greeno, Smith, & Moore, 1993). The impact of social and cultural experiences is an important consideration and suggests that the transfer of learning is 'situated' and affected by the learner's environment. Thus, there is a need to expand on Kolb's 'Experiential Learning Model' and attend to the social interactions and context inherent in knowledge acquisition. Given this, the cognitive and situated perspectives which account for cognitive, individual, social, and cultural elements on the transfer of learning are considered below and have important implications for the instructional strategies in teaching for the transfer of learning.

In the cognitive perspective, knowledge, in the individual mind of the learner, is thought of as an entity that is learned in one context and transmitted to

other contexts. "Cognitive approaches provide analyses about the ways in which knowledge must be structured and about the structures of knowledge in learners' minds that will be available to support task performance and transfer to new situations" (Anderson, Greeno, Reder, & Simon, 2000, p. 6).

The problems with cognitive approaches to the transfer of learning came to light through empirical studies in education that tested the cognitive outcomes of formal schooling (Pea, 1987). The findings demonstrated that inadequate connections were made between school and everyday life problem solving (Laboratory of Comparative Human Cognition, 1983). The cognitive perspective had been criticized for neglecting the processes of social interactions and focusing too heavily on individual development of intellectual skills. Pea (1987) suggested that the cognitive theories fall short and "accounts of transfer restricted to the individual and to cognitive aspects of the transfer problem must be considered a theoretical legerdemain" (p. 44) as other dimensions are present namely sociocultural and interpretive aspects for thinking and learning. These other dimensions also include the "sociology of knowledge use and acquisition, anthropological and cross-cultural issues about the interpretation situations for thinking and learning, and how motivational and attitudinal states may affect the likelihood of transfer (Pea, 1987, p. 44). "Insofar as a cognitive mechanics is possible, it will only be likely to suffice for a highly restricted set of knowledge use and acquisition situations" (Pea, 1987, p. 44). Cognitive approaches cannot account for selective knowledge transfer, which involves knowing what works and what is appropriate and is a valued outcome of thinking (Pea, 1987). For

example, "true computer literacy is not just knowing how to make use of computer and computational ideas. It is knowing when it is appropriate to do so" (Papert, 1980, p. 155).

The situated perspective in educational psychology began in the 1990s when researchers demonstrated that cognitive theories (e.g. schema theory) alone were insufficient in explaining complex human learning in authentic environments.  As early as 1983, the Laboratory of Comparative Human Cognition argued for cultural practice theory and suggested that social contexts contribute to experiences from which cognitive development and knowledge transfer arise. Contexts are not thought of as "physical features of setting, but in terms of the meanings of these settings constructed by the people present" (Pea, 1987, p. 46). Lave and Wenger (1991) stated the same and suggested that learning is not the transmission of knowledge that is decontextualized, rather is social and the process involves construction of knowledge between people that is situated in context and bound within a social environment.

The situativity theory of cognition proposes that learning occurs within the context and that it is 'applied' as well as within the moment (Brown, Collins, & Duguid, 1989; Lave and Wenger, 1991; Greeno, 1997).  Furthermore, "knowing is an activity that is situated with regard to an individual's position in the world of social affairs" (Cobb and Bowers, 1999, p. 5). "In the situative perspective, learning by individuals is considered as progress along trajectories of participation, which can involve acting more effectively in contributing more centrality to the functions communicated and in developing their identities as

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learners and knowledgeable people" (Anderson, Greeno, Reder, & Simon, 2000, p. 6). This "interactional concept of cognition in culture proves an important foundation for investigating the dimension of the knowledge transfer problem in education" (Pea, 1987, p. 46).

While the situated theories acknowledge social and cultural practices in the learning environment, cognitive perspectives should not be thought of as merely focusing on the unique mind of the learner as independent of what was learned and experienced in the social context (Anderson, Reder & Simon, 1995). "Cognitive psychology has always been deeply concerned with meaning and the relations of the parts of knowledge to the rest of the world" (Anderson, Reder & Simon, 1995, p. 19) and "the cognitive approach in no way denies the importance of the social "(Anderson, Reder and Simon, 1995. p. 20). The situated perspective has been criticized for giving limited importance to individuals as the focal point is on social practices (Anderson, Greeno, Reder, & Simon, 2000) and as such, "absorbs the individual in the group" (Anderson, Reder, & Simon, 1995, p. 18). Given this, Anderson, Greeno, Reder, and Simon suggest that "the cognitive approach should not be read as denying the value of learning in group activity, and the situative approach should not be read as denying the value of learning by individuals working by themselves" ( 2000, p. 2). The differences lie in the methods used to focus on the learning activity and are not limited to group or individual learning alone. "Situative and cognitive approaches can cast light on different aspects of the educational process, and both should be pursued vigorously" (Anderson, Greeno, Reder, & Simon, 2000. p. 5).

Transfer of learning is complex and no research consensus exists for cognitive or situated approaches that can explain transfer alone. Cognitive and situated perspectives provide information about the "processes of learning, conceptual development, problem solving, reasoning, and communication" (Anderson, Greeno, Reder, & Simon, 2000, p. 5) that collectively impact discussions about the transfer of learning. Although the perspectives view these processes differently, "both perspectives are needed" (Anderson, Greeno, Reder, & Simon, 2000, 5). "Research in both the cognitive and situative perspectives has provided significant information and understanding of conditions in which learning has general effects in human performance" (Anderson, Greeno, Reder, & Simon, 2000, p. 4), thus "it is important to study these practices and perform cognitive and situative analyses" (Anderson, Greeno, Reder, & Simon, 2000 p. 5). To concur Cornford (2005) argued that "cognitive processes are central to understanding and attaining effective learning for workplaces but social factors will also influence acquisition and performance, hence there needs to be a distinct balance between the cognitive and social sides of the equation" (p. 2). For example, "cognitive perspective provides important analyses of information structures in conceptual understanding and procedures that are needed for students to succeed in the tasks [and] situative perspectives provides important analyses that emphasize students' participation in socially organized activities of learning, including patterns of classroom discourse and the opportunities to learn how to participate in the learning practices" (Anderson, Greeno, Reder, & Simon, 2000, p. 3).

Anderson, Reder and Simon (1997) and Greeno (1997) acknowledge harmony between the cognitive and situated perspectives on educational issues that are important to the transfer of learning. Both perspectives share the following elements in common (Anderson, Reder,& Simon, 1997, p. 18; Anderson, Greeno, Reder, & Simon, 2000) and these are important considerations that are directly applicable to the instructional strategies presented in the next section:

a) Learning need not be bound to the specific situation of its application. Individual and social perspectives on activity are both fundamentally important in education. In this vein, academic instruction is thought to be able to generalize to real work situations and attention is focused on promoting transfer.

b)  Knowledge can indeed transfer between different sorts of tasks, and can transfer between disciplines.

c) Abstract instruction can be very effective and one need not teach everything in concrete, almost vocational settings.

d) Instruction need not take place only in complex social situations. Essentially, there is value in the individuality of learning and instruction that focuses explicitly on competence, as well as group/ co-operative learning.

In summary, the cognitive and situated perspectives on the transfer of learning are acknowledged as being distinct while sharing similarities. Transfer can be thought of as cognitively selective wherein "appropriate transfer is

socioculturally defined for particular purposes, tasks, and thinking situations"
(Pea, 1987, p. 57). With this understanding, the instructional strategies that
support the transfer of learning are discussed next.

**Instructional Strategies for the Transfer of Learning**

The development of successful instructional strategies for the transfer of
learning is a critical concern in education as academia aspires to prepare
students for productive transitions to new contexts and particularly since the
research shows that transfer does not often occur spontaneously. The point is
that if educators want learners to achieve transfer of learning it seems evident
from the literature that they need to explicitly instruct for it. Costa and Garmston
(2002) discussed the need for explicit instruction of thinking skills by way of direct
and systematic instruction because learners often do not learn 'how to think' or
'think critically' merely by being asked to do so. Furthermore, a key outcome from
the transfer of learning findings demonstrates that learners' ability to think
critically does not automatically result from study in academic disciplines or
subjects.

Costa and Garmston's (2002) recommendations bear particular relevance
to the challenges that co-op programs confront. Their recommendations support
the underlying problem statement of this study being that co-op students do not
readily achieve transfer of learning merely by participating in a co-op work term
(Ricks et al., 1993; Schaafsma, 1996; Van Gyn, 1996).  Given this, it can be
suggested that in order to optimize performance in work settings, co-op students
require exposure to the concept of transfer and explicit instruction in thinking

skills for the transfer of learning prior to undertaking a work or school term.  As this instruction would optimally occur prior to the student undertaking a new learning experience (e.g. co-op work term), the instructional strategies are aligned with the instruction of conceptual and/or abstract thinking skills.

The thinking skills movement was initiated by educators as a response to the identified knowledge transfer problem in an attempt to overcome the irrelevances of school curricula and to keep abreast of the rapid changes of the information age (Pea, 1987). "A number of voices from the thinking skills movement have focused on the transfer issue again, igniting sparks of urgent concern" (Bellanca and Fogarty, 2003, p. 248). During the early years of the movement, the ongoing debate was whether the explicit instruction of thinking skills should be connected to the study of the academic subject (content-specific) or taught separately (generalized).  Pea (1987) commented that "many thinking-skills curricula have been largely developed and taught independently of course content" and he argued for greater curricular synergy in order for learners to "acquire and apply knowledge in an integrated manner that matches the demands of everyday problem solving" (Pea, 1987, p. 39)  that the learner may encounter.  To concur, "current transfer research suggests that when teachers pay attention to transfer in contextual learning situations and when teachers accompany general strategies with self-monitoring techniques, students can transfer" (Bellanca and Fogarty, 2003, p. 249) their learning.

Pea reviewed many studies on the transfer of learning in his 1987 paper with respect to the related difficulties of knowledge transfer from school learning

to everyday life. From these studies, Pea (1987) made recommendations on how to support the transfer of learning and focused on thinking skills instruction that was grounded in psychological research.   The theoretical underpinnings of the instructional strategies flow from the view that the "central issue in acquiring knowledge is its appropriate transfer beyond the contexts and contents of first acquisition" (Pea, 1987, p. 38). Pea's (1987) main conclusion, based on many empirical studies, was the development of 'situation reading' as a concept that greatly affected knowledge transfer and highlighted the concerns with cognitive theories and cognitive approaches to research. Situation reading, related to situated reading (as discussed by Lave, 1987) is the manner in which a thinker reads a situation and the underlying problem as being appropriate or not for transfer.  Appropriate transfer is defined as the selective and thoughtful application of knowledge or skills to new contexts in a manner that is socioculturally and cognitively defined.  This concept was directly related to the knowledge transfer problem and the definition of intelligence as it considers the shift to context-free generalizations from context-dependent knowledge use. Knowledge transfer aimed to focus on situated reading and not an indiscriminate application of knowledge to new situations.

Additionally, since knowledge transfer was more complex than the 'Common Elements Theory' described, the view of knowledge transfer became the selective use of appropriate knowledge. This thinking shifted the knowledge transfer problem to a paradigm that embraced the cultural and social elements of transfer, or as Pea (1987) referred to it, the interpretative perspective.  "It seems

likely that using an interpretive approach to the problem of selective knowledge transfer will offer a more productive orientation to educational activities designed for promoting transfer than the traditional common elements one" (Pea, 1987, p. 46). This perspective went beyond the knowledge state and cognitive being to recognize elements that explained what the learner read as appropriate transfer, thus knowing when and what was transferable as judged by the learners' cultural and individual value system (Pea, 1987). Furthermore, Hoffding (1892) reminded researchers of the role of the learner's perceptions and how novel contexts were connected with the thinker's perceived experiences of previous situations.

The outcome of the interpretive approach to the transfer of learning was the recognition that cognitive outcomes had context-based characteristics and were influenced by prior knowledge. Therefore, the environment wherein the interaction occurred was important to observe (Laboratory of Comparative Human Cognition, 1983). Making meaning from experience was thought to be derived from the settings in which the experience occurred and not in terms of the common features of the setting, thus, it is an interactional conception of cognition (Laboratory of Comparative Human Cognition, 1983). As Pea (1987) pointed out, the overlaps in environments and the resources the thinker employed for noticing the areas of overlap occurred in ways which acknowledged prior experiences and were carried from one experience to another. Based on this, Pea (1987) put forward some recommendations which pointed to the importance of education for "bridging knowledge utilization across contexts of values within a culture" (p. 47) and suggested that symbolic environments could

be created in computer mediums to extend the "environments in which available knowledge is viewed as appropriate for transfer" (p. 47). Pea noted that technology could be used to foster appropriate transfer of knowledge in education by way of creating tools that enhanced what was adopted by the learners as a "self-aware transfer state of mind" (Pea, 1987, p. 55) as well as providing the "transfer-relevant access skills" (Pea, 1987, p. 55). Furthermore, the tools would "make it feasible for students to represent and connect the substantive details of in-school and out-of-school thinking experiences" (Pea, 1987, p. 56). With this approach, students could construct and represent their knowledge "on an electronic blackboard" (Pea, 1987, p. 56) that served as a "software placeholder of one's conceptual understanding" (Pea, 1987, p. 56). Pea (1987) predicted that the exercise of explicitly articulating knowledge in such a method would render better organization of this knowledge for the learner thus making it more readily retrieved for transfer. Given Pea's recommendations, which date back to 1987, it was of significant interest to the researcher to review the BOL course as this online preparatory curriculum intends to service all the recommendations that Pea put forward.

The knowledge transfer problem begs the question of what education can do to "better provide for the kinds of activities and emphases that will support students in learning for appropriate transfer?" (Pea, 1987, p. 49). "Some answers are suggested by psychological research on instruction in thinking skills" (Pea, 1987, p. 49) including "knowledge acquisition in functional contexts, providing multiple-domain knowledge application examples and experiences,

creating bridging instruction across school and nonschool problem situations,

and integrating subject learning with synergistic design" (p. 50).  Other

suggestions are inclusive of instructional strategies such as supporting

thoughtfulness, seeking generalizations, seeking opportunities to apply prior

knowledge, monitoring thinking, and the deliberation of whether strategies are

appropriate for approaching new tasks (Fogarty et al., 1992). Schoenfeld (1985)

suggests the importance of teaching generalizable thinking skills such as those

related to problem-solving, and planning, and goal monitoring to name a few.

Bransford, Arbitman-Smith, Stein, and Vye (1985) discussed features of learning

contexts that were thought to be effective for the enhancement of instructional

strategies for the transfer of learning, including learning that takes place in

context, learning that is effectively mediated wherein structure is given to help

make connections between experiences, and learning that is functional in that

the concepts and skills are acquired as tools that have diverse purposes.

Bransford et al. (1985) also recommended the explicit instruction of thinking skills

which involves highlighting the needs and purpose of the learning activity to the

learner.

**Hugging and Bridging**

Thinking skill instructional strategies for the transfer of learning typically

come in two formats, hugging and bridging techniques both originally discussed

by Salomon and Perkins (1988). Hugging is typically used to foster near transfer

and involves "making the learning experience more like the ultimate applications"

(Fogarty et al., 1992, p. xii) and serves reflexive/ automatic transfer. To foster

hugging, the techniques that educators typically use are to set students'

expectations for transfer, simulate situations, and model application contexts.

The transfer then feels automatic for students and is part of the learning

experience. Bridging is typically used to foster far transfer and involves teaching

learners to make conceptual connections between what has been learned to

novel applications by "mindfully abstracting knowledge and skills from one

context and applying them in another" (Fogarty et al., 1992, p. 64). The bridging

techniques are cerebral, and less experiential, thus serve reflective transfer

wherein for example students make generalizations, monitor their thinking, and

engage in mindful connection-making (Fogarty et al., 1992). Educators may

introduce analogies and help students to think through them while having

students reflect metacognitively on their thinking; in this way "the transfer is

aware and thoughtful" (Fogarty et al., 1992, p. xii). Alternatively, bridging

techniques can bridge backwards by asking students to think about a present

situation, generalize the needs of the situation, and to recall applicable and

relevant prior knowledge and skills (Fogarty et al., 1992) by relying on high-road

transfer mechanisms.

With practical transfer of learning, or using the hugging techniques, the

danger is that "knowledge can become overly situational, with students failing to

appreciate its range of application" (Singley, p. 73, cited in McKeough, Lupart, &

Marini, 1995) perhaps resulting in limited skills transfer. On the other hand,

conceptual transfer promotes "generality by exemplifying abstractions in a variety

of concrete problem-solving situations" (Singley, p. 73, cited in McKeough,

Lupart, & Marini, 1995) resulting in skills transfer that occurs more readily.

**Bridging Techniques**

To expand on the thinking skills that are most relevant to the context of co-

operative education and support the learning objectives of the BOL course, the

bridging techniques are discussed in more detail. Bridging involves "teaching a

general principle and then helping students see how it works in multiple

situations" (Pea, 1987, p. 51). "By bridging skill instruction and content

application, teachers foster strong transfer of student learning. This transfer, in

turn, helps students develop deep understandings of the thinking processes for

future, ongoing applications on their own" (Bellanca and Fogarty, 2003, p. 190).

Bridging techniques are also defined as helping learners make conceptual

connections between what has been learned and other applications in a more

cerebral, less experiential approach wherein learners generalize and reflect

(Fogarty et al., 1992). Feuerstein, Rand, Hoffman, and Miller (1980)  used

bridging problems to 1) help students draw on their own experiences, 2) increase

the potentially infinite number of applications of principles to authentic

experiences, 3) generate examples that index the student's level of

understanding, and 4) give students the opportunity to apply the principle in

diverse contexts. Brown and Campione (1981) discussed bridging as an

approach that explicitly instructs students to understand the range of knowledge

applicability in order to encourage access to knowledge and skills that are

transferable.  Lave (1996) stated that bridging instruction was a wisdom that prepared the learner for life and learning in context-free terms.

The crux of bridging is in the instruction of conceptual and/or abstract thinking skills. Bransford, Brown, and Cocking (1999) advocated for abstract representations of knowledge in order to promote transfer as knowledge that is overly contextualized may impair transfer. While formal schooling was considered influential for the development of cognitive abilities and the learning of rules and principles that have potential for transfer, Pea (1987) argued that the importance was in synthesizing the "abstract treatment of reasoning considered as the support for transfer of learning, otherwise, students may not notice occasions for school-type reasoning outside the school setting" (p. 52). Cognitive studies have shown that learners lack the ability to executively manage their mental resources and need self-management skills for thinking and learning (Pea, 1987) which can be taught through the instruction of abstract thinking skills. Instruction that included self-management cognitive drills was found to positively impact transfer effects (Pea, 1987).

Studies that support the positive outcomes of abstract instruction are prevalent. Beiderman and Shiffrar (1987) demonstrated that transfer improved considerably if the instruction involved teaching about the abstract principles inherent in a learning situation.   In a study by Singley and Anderson (1989), students showed positive transfer of learning with new text editors if the common abstract structures were identified even if the surface structures were largely different. Further studies by the National Research Council (1994) showed

benefits for transfer of learning when learners were asked to represent their experiences and learning at abstract levels that transcend the specificity of the context of acquisition. Holyoak (1984) and Novick and Holyoak (1991) demonstrated that abstract representations become integrated into the learner's schema (the learner's guide to thinking) and do not remain in isolated activities. Finally, Gick and Holyoak (1983) showed that in order to foster flexible transfer, learners were instructed in abstract and general principles which engaged the learner in the "what-if" problem solving design to increase the flexibility of understanding.

Bridging techniques are complex instructional strategies that aim to support transfer of learning through the teaching of abstract thinking skills. Fogarty et al. (1992) defined the bridging techniques in the instruction of the thinking skills for the transfer of learning through five methods:  1) anticipating applications, 2) generalizing concepts, 3) using analogies, 4) parallel problem solving, and 5) metacognitive reflection. The bridging techniques are detailed below and form the conceptual framework for this study as the techniques support the thinking skills that are aligned with the learning objectives of the BOL course (as demonstrated in the next section) and serve the purpose of this study and the primary research question. This study is the first to use the bridging techniques as an evaluation framework to assess thinking skills as the techniques were originally developed by Fogarty et al. (1992) as a theoretical framework to support teachers' ability to transfer the learning acquired in workshops and conferences into the classroom.

The five bridging techniques for teaching the thinking skills for the transfer of learning are the a priori main codes in the research design and provided structure for organizing and sorting the data as well as during the data analysis and synthesis.

**Bridging Techniques Detailed**

*Anticipating applications* is defined as thinking about upcoming opportunities to use new ideas in a different context. Furthermore, it involves thinking about adjustments that will make the application relevant, otherwise referred to as scouting for relevant uses. In anticipating applications, diverse applications are targeted rather than assuming spontaneous transfer will occur. Some examples include asking students to predict possible applications remote from the learning context. For example, after students have practiced a thinking skill, the instruction may ask: Where might you use this or adapt it? Let's brainstorm, be creative and list the ideas and discuss some.

*Generalizing concepts* is defined as asking students to extract the generic ideas out of a situation and encourage the use of generalizable concepts through looking for principles, big picture ideas, or underlying constructs. Some ways of doing this is to ask students to generalize from their experience to produce widely applicable principles, rules, and ideas. An example from Fogarty et al. (1992) suggests that after studying the discovery of radium, ask, "What big generalizations about scientific discovery does the discovery of radium suggest? Can you support your generalizations by other evidence you know of?"

*Using analogies* is defined as finding, creating or analyzing analogies as well as comparing and finding similarities between situations using metaphors to make creative connections. Some ways of doing this are to engage students in finding and elaborating on an analogy between a topic under study and something distinct from it. An example from Fogarty et al. (1992) asks students to compare and contrast the structure of the human circulatory system with the structure of water and waste services in a city. The systematic comparison of unpacking the analogy by elaboration and extending the thinking will force the transfer of learning between different situations.

*Parallel problem solving* is defined as solving problems with similar structures and content in different contexts; further, gaining an understanding for the similarities and contrasts between areas. Some ways of doing this are to engage students in solving problems with parallel structures in two different areas in order for them to gain an appreciation for the similarities and contrasts. For example, Fogarty et al. (1992) had students investigate a (non sensitive) problem in their home environment and a study problem in school, using the same problem solving strategy. The instruction helped students to draw out the parallels and differences.

*Metacognitive reflection* is defined as thinking about thinking; planning, monitoring and tracking one's progress, and evaluating one's thinking. Also, metacognitive reflection is being able to control one's thinking and subsequent behavior. Metacognition is being aware, strategic, and reflective in the use of thinking about thinking, and through this knowing, the learner will understand

how to approach a task and how to approach it better in subsequent

performances.  Some ways to do this are to prompt and support students in

planning, monitoring, and evaluating their own thinking. For example Fogarty et

al. (1992) suggested that after a quiz or any thought-demanding activity, students

should ask themselves, "What went well, what was hard, and how could I handle

what was hard better next time?"

**Summary of the Transfer of Learning Literature Review**

Table 5 recaptures the key outcomes from the transfer of learning

literature review with respect to the research findings, and the conditions and

instructional strategies that support the transfer of learning.

**Table 5. Key Outcomes from the Transfer of Learning Literature Review**

**The key outcomes from the transfer of learning research findings are that:**
- transfer of learning must be explicitly taught for in order to stimulate transfer to new contexts,
- learners need to be able to think about situations and develop a transfer of learning thinking-ability versus being placed in cloned situations,
- training has limited impact on transfer; learners need to have an understanding of far transfer wherein contexts that are seemingly diverse are seen as more near, and
- learners need to be taught the ability to reflect on the potential for the transfer of learning in situations.

**The conditions that support the transfer of learning are summarized as:**
- practice,
- explicit abstraction,
- active self-monitoring,
- arousing mindfulness, and
- using a metaphor or analogy.

**The instructional strategies that support the bridging techniques for the transfer of learning are:**
- anticipating applications,
- parallel problem solving,
- generalizing concepts,
- using analogies, and
- metacognitive reflection.

# ALIGNMENT OF BOL CURRICULUM WITH THE LITERATURE

This section describes how the researcher decided which topics within the BOL I course to focus on for the study. It was important to demonstrate that the design of the instructional setting is aligned with the most current understanding of effective practice in order to justify  and investigation of the outcomes and process of that instruction.

As the researcher has deep and detailed knowledge of the BOL course, the researcher believed that the online discussions of students participating in the Skills Transfer Module in BOL I would likely give evidence of the thinking skills that demonstrate the bridging techniques as they support the transfer of

learning. To test this intuition and develop the specific context of this study, the

researcher conducted a comprehensive review of the entire BOL curriculum. The

review consisted of a deep examination of the:

- the entire BOL I and BOL II curriculum,
- BOL I and BOL II learning objectives (see Appendix B), and
- BOL I and BOL II reflection exercises (see Appendix C).

Upon conclusion of the review, the researcher was confident that the Skills

Transfer learning module in BOL I would serve as the specific focus of this study.

However, in order to properly proceed with this study, the researcher needed to

assess the alignment of the Skills Transfer learning module in BOL I with the

understandings derived from the transfer of learning literature review related to

the 1) key research findings, 2) conditions that support the transfer of learning,

and 3) instructional strategies. These analyses are detailed in the summary

tables below.


**Key Outcomes from Research Findings**

Table 6 demonstrates the robust areas of alignment between the transfer

of learning research findings and the Skills Transfer learning module in BOL I..


**Table 6. Transfer of Learning Key Outcomes and Alignment with Skills Transfer Learning Module in BOL I**

| Key Outcomes from Research Findings | Skills Transfer Learning Module in BOL I |
|---|---|
| Transfer of learning must be explicitly taught for in order to stimulate transfer to new contexts. | The Skills versus Tasks and Components of a Skill topics explicitly instruct for the concept of transfer of learning, as does the entire Skill Transfer learning module. Students are given the knowledge base to understand that transfer is complex and are asked to think about specific contexts to |

| | transfer their skills, knowledge, abilities, and ideas. |
|---|---|
| Learners need to be able to think about situations and develop a transfer of learning thinking-ability versus being placed in cloned situations. | The Components of a Skill and Enhancing Skills Transfer topics discuss how to think about skills and/or tasks by being able to relate to the differences between having a skill and being able to transfer or mobilize that skill when approaching new situations. Students are asked to think about their abilities and knowledge and the gaps they have in transferring their skills to novel contexts. |
| As training has limited impact on transfer, learners need to have an understanding of far transfer wherein contexts that are seemingly diverse are seen as more near. | The Near versus Far Transfer topic discusses near and far transfer and asks students to think about how to transfer prior learning and experiences to new contexts through problem solving and gap analysis. |
| Learners need to be taught the ability to reflect on the potential for the transfer of learning in situations. | The Metacognition and Enhancing Skills Transfer topics instruct for and facilitate metacognitive and reflective practice and discuss strategies to enhance the ability and potential for the transfer of learning.  Students are asked to reflect on past situations and think about the general and generalizable strategies that may have potential for transfer to new situations. Students also discuss processes they engage with in order to increase the potential for transferring their skills. |
| Learners need to be taught to monitor and direct their transfer of learning capabilities. | The Metacognition topic fosters self-directed learning and thinking (implies reflective and executive abilities of planning and assessment) as the foundation from which to develop other concepts of transfer. Students are asked to think about their thinking through processes of monitoring, assessing and planning. |

**Conditions that Support the Transfer of Learning**

Table 7 demonstrates the areas of alignment between the conditions that

foster the transfer of learning and the curriculum in the Skills Transfer learning

module of BOL I and it does not appear that there were any gaps.

Table 7. Conditions that Support the Transfer of Learning and Alignment with Skills Transfer Learning Module in BOL I

| Conditions that Support the Transfer of Learning | How the Skills Transfer Learning Module in BOL I Provides the Conditions that Support the Transfer of Learning |
|---|---|
| Practice | The Skills versus. Tasks topic aims to prepare students to be able to transfer their learning by asking them to deconstruct their tasks in terms of skills, and to understand their skills at a foundational level in order to appreciate how skills and bundles of skills can be transferred to new situations. This process allows the student to practice thinking about how to transfer skills so they can be more readily triggered in new contexts. |
| Explicit abstraction | The Metacognition and Enhancing Skills Transfer topics aim to foster abstract thinking about skills and knowledge by asking students to extract the generalizable principles and/or structure out of an experience and think about how these may be transferable to a new context. |
| Active self-monitoring | The Metacognition topic intends to engage students in thinking about their thinking processes by asking them to look back on past experiences and reflect on the thinking skills they engaged with such as planning, evaluating, and monitoring. Students also think about how these metacognitive thinking skills have impacted their performance, in an effort to foster active self-monitoring. |
| Arousing mindfulness | The Components of a Skill topic aims to arouse mindfulness by asking the student to think about their abilities and knowledge and the contexts that these were gained in, in order to arouse reflective skill use rather than reflexive application of the skill to a new context in order to assess the skill and appropriateness for transfer. Additionally, the Near versus Far Transfer topic arouses mindfulness by asking the student to think about prior experiences and assess the relevance of there to current situations through an understanding of near and far transfer. |
| Using a metaphor or analogy | The Enhancing Skills Transfer topic aims to instruct for various strategies that enhance the potential for skills transfer and asks that students think through metaphors and analogies to help transfer their skills for transfer to new contexts. |

**Instructional Strategies**

It can be suggested that the Skills Transfer Learning Module in BOL I supports the five bridging instructional strategies for teaching the thinking skills for the transfer of learning as outlined by Fogarty et al. (1992). The Skills Transfer Learning Module in BOL I supports the bridging instructional strategies through the curricular content and reflection exercises that students are engaged with. Table 8 represents the BOL I course reflection exercise (see Appendix C) that would most probably deliver the bridging instructional strategy.

Table 8. Bridging Instructional Strategy and Alignment with Skills Transfer Learning Module Reflection Exercises in BOL I

| Bridging Instructional Strategies | Reflection Exercises from the Skills Transfer Learning Module in BOL I |
|---|---|
| Anticipating applications | Topic: Skills vs. Tasks, Reflection Exercise 1 |
| Generalizing concepts and Using analogies | Topic: Enhancing Skills Transfer, Reflection Exercise 5 |
| Parallel problem solving | Topic: Near vs. Far Transfer, Reflection Exercise 2 |
| Metacognitive reflection | Topic: Metacognition, Reflection Exercise 4<br>Topic: Components of a Skill, Reflection Exercise 3 |

In presenting this alignment, the researcher recognizes that teaching for transfer is a continual process wherein the bridging strategies build upon one another. For example, as demonstrated in Table 8, there is overlap wherein one reflection exercise may deliver more than one bridging instructional strategies. Furthermore, there are multiple opportunities to further practice the bridging techniques throughout the BOL I course that are not presented in the above alignment.  For example, as noted in Chapter 2, the BOL I course provides

diverse practice and performance opportunities for students to engage with the skills and concepts learned in the Skills Transfer learning module such as in the resume and interview topics in the Effective Communication learning module. Additionally, to support the bridging instructional strategies, the BOL course facilitators weave the concepts through the curriculum, and the concepts are also fostered by the student's co-op coordinator throughout the student's participation in the co-op program.

**Summary of the Specific Context of the Study**

In conclusion, the Skills Transfer learning module in BOL I is strongly aligned with the understandings derived from the transfer of learning literature review. Thus, the Skills Transfer learning module in BOL I has good potential to provide evidence of the thinking skills that demonstrate the bridging techniques as they support the transfer of learning. Appendix H is a comprehensive summary of how the Skills Transfer learning module in BOL I supports the transfer of learning.

# CHAPTER FOUR: METHODS

## INTRODUCTION AND OVERVIEW

The primary purpose of this study was to explore the opportunities for the transfer of learning in the Skills Transfer learning module of the BOL I course. Evidence for the transfer of learning was sought through an analysis of co-op students' online discussions to the BOL course reflection exercises to understand if the thinking skills exhibited were consistent with what is understood about bridging techniques that support the transfer of learning.

The researcher believed that an examination of thinking skills exhibited by students participating in the Skills Transfer learning module in BOL I would 1) provide evidence for Fogarty et al. (1992) five bridging techniques and 2) provide a basis if necessary to make recommendations regarding the curriculum and online delivery.

To shed light on this study the following research questions were addressed:

1. The primary research question is: In what ways do co-op students enrolled in BOL show evidence for the thinking skills that underpin the five bridging techniques as outlined by Fogarty, Perkins, and Barrell, (1992): 1) anticipating applications, 2) generalizing concepts, 3) using analogies, 4) parallel problem

solving, and 5) metacognitive reflection that are consistent with what is understood to support the transfer of learning?

2.  In what ways do co-op employer experts value the thinking skills of co-op students in the BOL course (as exhibited in the primary research question) as relevant in a workplace context with respect to the transfer of learning?

3.  In what ways do the BOL course facilitators understand the thinking skills of co-op students and the transfer of learning?

This chapter begins with a definition of qualitative methodology and provides a rationale for the use of the qualitative research approach to answer the research purpose and primary research question. Following this, the research participants and setting are described along with an overview of the research design. The data collection methods are then detailed prior to a discussion of the data analysis and synthesis procedures. This chapter also discusses ethical considerations, trustworthiness of the methods, and limitations.

## Research Tradition

In determining an inquiry approach that would best service the primary research question, while being aligned with the research problem and purpose of the study, the researcher examined theoretical principles and knowledge claims of qualitative and quantitative research approaches in order to position this study within a particular inquiry tradition.

The assumption of this study was that the primary research question was adequate to reveal the data the researcher needed in order to carry out and

serve the purpose of this study. The researcher attempted to understand the study from a context-specific perspective which required close examination of the data in their natural setting. These knowledge claims positioned this study in a social constructivist research paradigm, a qualitative approach that is concerned with the complexities of sociocultural experiences from a holistic perspective (Bloomberg and Volpe, 2008). The central assumptions of the social constructivist research paradigm is that 1) reality is socially constructed in situ, 2) individuals develop subjective meanings of experiences, and 3) the researcher's role is to understand the perspectives of the participants (Lincoln and Guba, 1985). In this paradigm the researcher doesn't begin with a hypothesis, rather the primary research question and additional questions aim to support the purpose of the study via the data collected in context while emphasizing exploration and description. As such, qualitative research is well suited to provide the in-depth understanding required in this study.

## Research Approach

The approach within the qualitative tradition that best addressed the primary research question was qualitative content-analysis. Essentially the approach is qualitative text-analysis coupled with quantitative content-analysis within the tradition of qualitative methodology. Mayring (2000) developed the qualitative content-analysis approach for the systematic analysis of text over twenty years ago. The benefit of qualitative content-analysis is "to preserve the advantages of quantitative content-analysis as developed within communication

science and to transfer and further develop them to qualitative-interpretative steps of analysis" (Mayring, 2000, p. 1).

Qualitative text-analysis is the examination of text documents with the main purpose to identify patterns in text.  The text is referred to as the written and formally structured document that has clear authorship, purpose, and audience. Postmodernists refer to the "text" from a metaphorical perspective; the text is not only written artifacts but includes human discourse and/or social interaction, such as online discussions. The assumption in text-based analysis is that the text stands alone and represents the idiomatic expressions that convey meaning. An important distinction in content-analysis is between the manifest content of the communication and its latent meaning. Manifest meaning is the "what" of the communication and latent meaning is the context information. Critics of quantitative analysis raised a concern against superficial quantitative analysis that does not respect latent contents and as such, contexts are concerned with working on simplifying and distorting quantifications (Kracauer, 1952).   Given this, "qualitative approaches to content analysis had been developed (Ritsert 1972; Mostyn 1985; Wittkowski 1994; Altheide 1996, in Mayring, 2008, p. 3) that focus on latent meaning and with respect to this study are aligned with sociocultural and cognitive perspectives.

Qualitative content-analysis borrows terminology and methods from quantitative content-analysis; subsequently, it aims to be distinct from other more qualitative and interpretive analysis in that it intends to meet scientific standards (Bird 1998; Klee 1997) and therefore fits in social research meaning that certain

criteria are met. Content-analysis methodology is defined in many different ways in the literature and many ascertain the approach as quantitative methodology. Neuendorf (2000) defined content-analysis as a " summarizing, quantitative analysis of messages that relies on the scientific method (including attention to objectivity-intersubjectivity, a priori design, reliability, validity, generalizability, replicability, and hypothesis testing) and is not limited as to the types of variables that may be measured or the context in which the messages are created or presented"(p. 10).

To expand on Neuendorf's (2000) definition, these elements of the scientific method are described. Attention to objectivity-intersubjectivity means that knowledge and facts are socially agreed upon and consistencies in the findings are at the forefront. To meet this criterion as well as the guidelines of scientific endeavor, a priori design procedures are needed and require that "all decisions on variables, their measurement, and coding rules must be made before the observation begins" (Neuendorf, 2000, p. 11). Reliability is the extent to which the procedures in the data analysis produce the same results on repeated attempts, essentially that inter-rater reliability, or the agreement between two or more coders in the study, is achieved at a high level. Validity refers to the degree to which an empirical measure adequately reflects what is agreed as the real meaning of a concept (Neuendorf, 2000), in that what is measured is really what was intended to be measured. Generalizability is the extent to which the findings can be applied to a larger set of the population from which the research participants were drawn. Finally, replicability is the safeguard

against overgeneralizing the findings (Neuendorf, 2000) and involves the repetition of the study in different contexts with verification that similar outcomes are attained.

Related, but slightly different, "qualitative content analysis defines itself within this framework as an approach of empirical, methodologically controlled analysis of texts within their context of communication, following content analytical rules and step by step models, without rash quantification" (Mayring, 2000, p. 2). Qualitative content-analysis borrows terminology and procedures from the aforementioned definition of quantitative content-analysis, however, a basic tenet of qualitative research is to describe a phenomenon in-depth, thus qualitative procedures do not lend themselves nor aspire to for example make generalizations to other contexts, or producing replicable studies. More relevant to qualitative methodology is credibility, dependability, confirmability, and transferability of the study and these issues of trustworthiness will be discussed in a later section.

In order for qualitative content-analysis to conserve the strengths of quantitative content-analysis, Mayring (2000) identifies four practices that need to be maintained:

1. The text must fit into a communication model and it must be determined on what component of the communication the inferences are to be made for example: experiences, opinions of the situation, the socio-cultural background, the text itself, or the effect of the message.

2. With respect to the rules of analysis, the text is to be analyzed systematically step by step following specific rules and using content analytical units.

3. Categories are the center of the analysis; the interpretation of the text follows the research question and is to be put into categories that are founded and revised through process of analysis, for example feedback loops.

4. Reliability and validity must be adhered to: the procedure must be inter-subjectively comprehensible, the results must be triangulated, and inter-rater reliability is a calculated for qualitative content-analysis using Cohen's Kappa (over .7 would be sufficient).

What makes content-analysis a rich and meaningful approach is its reliance on a priori design for coding the data and this also adds to the significance of the study as mentioned in the introduction. Two approaches to a priori design exist, namely inductive and deductive development. Inductive development involves the formation of a priori codes from the text itself; "The main idea of the procedure is, to formulate a criterion of definition, derived from theoretical background and research questions, which determine the aspects of the textual material taken into account. Following this criterion the material is worked through and codes are tentative and step by step deduced. Within a feedback loop those codes are revised, eventually reduced to main categories and checked in respect to their reliability" (Mayring, 2000, p. 5). Conversely, deductive development is the application of prior and previously formulated information that is theoretically derived and are brought in connection with the text for procedures of analysis (Mayring, 2000). The qualitative step of analysis

consists of a methodologically controlled assignment of the codes to a passage of text (Mayring, 2000).

The benefits of content-analysis are that when it is applied properly to a study, the methods engage powerful data reduction techniques. This benefit comes from the ability to make systematic findings and compress the large volume of text based on established rules of coding.  Another benefit of content-analysis is that it allows for a close analysis of the text and since the search for structures and patterns in the text are based on a priori goals, the researcher is able to answer the primary research question and substantiate the interpretations made regarding the phenomenon under study.

In summary, the qualitative tradition provided direction for the methods of data collection and research design and the qualitative content-analysis approach provided guidance for the deductive data analysis and synthesis procedures.

## RESEARCH PARTICIPANTS

There are three research questions in this study and respectively three populations from which data were drawn.

### Student Research Participants

To answer the primary research question, the first population from which the research participants were drawn came from undergraduate level male and female university students from SFU who had applied to participate in the co-op program and had registered in the BOL I course. The population represented

students from a variety of academic programs (with the exception of Engineering).

The entire population of BOL I course registrants who were participating in the Summer 2009 session 7 (July 13- July 27, 2009) and Fall 2009 session 1 (September 14- September 28, 2009) of the BOL I course were invited to participate in the study.

These BOL I sessions were selected for the reason that they were typical applications of the BOL I course and were offered during different semesters and at different times of the semester to allow for maximum variation. All students self-registered for the BOL I course and the researcher did not influence the selection of research participants, thus meeting qualitative tradition standards. Since there were no specific criteria for inclusion, there was no judgment sampling of the research participants. Employing a strategy wherein no purposeful selection of research participants was made allowed for maximum variation and multiple perspectives.  Furthermore, to support qualitative methodology, given that there was no random sampling to control for bias, generalizations from the study may conservatively only be made to other BOL cohorts in general. The goal of this study and qualitative research in general is not to generalize to another contexts and representativeness in the research population is secondary to the research participants being able to provide information about themselves and their setting (Bloomberg and Volpe, 2008).

Prior to beginning the BOL I course registrants were emailed an invitation to join the study; the invitation included details about the study and information

about the risk of participation. Students were not informed about the specific research question, however, they were made aware that the researcher would access the online discussions upon conclusion of the course. Each student was asked to respond to the informed consent form (see Appendix D) in order to give permission to the researcher to observe and analyze the online discussions. The students that voluntarily agreed to participate in the study became the research participants. In summary, 28 students agreed to participate and the overall response rate was 61.7%.

**Co-op Employer Expert Research Participants**

To answer the second research question, the second population from which the research participants were drawn was from the group of co-op employer experts who work with the BOL course at SFU. The co-op employer experts are industry professionals and/or members of the SFU co-op alumni who interact online in an advisory capacity with students in the BOL course. The co-op employer experts have diverse backgrounds and collectively have experience in areas of business, technology, consulting, business education, and professional/career counselling. The co-op employer experts were contacted via email and invited to participate in this study. The informed consent form (see Appendix E) included the study details and information about the risk of participation.

The co-op employer experts self-selected their participation in the study thus the researcher did not influence participation. In summary, four co-op

employer experts agreed to participate and the overall response rate was 44.44%.

**BOL Course Facilitator Research Participants**

To answer the third research question, the third population from which the research participants were drawn came from the group of BOL course facilitators who instruct the BOL course at SFU. There were two different groups of BOL course facilitators. The first group of BOL course facilitators were those that actively facilitated the Summer 2009 session 7 (July 13- July 27, 2009) and Fall 2009 session 1 (September 14- September 28, 2009) of the BOL I course. Prior to their facilitation of these sessions, the BOL course facilitators were contacted via email and invited to participate in this study. The informed consent form (see Appendix D) included the study details and information about the risk of participation. All BOL course facilitators agreed to participate and the overall response rate was 100%.

The second group of BOL course facilitators was drawn from the entire team of BOL course facilitators. These BOL course facilitators were invited by email to attend a Fall 2009 debrief and discussion session about the BOL program. Eight BOL course facilitators attended the meeting and the overall response rate was 29.63%.

## RESEARCH DESIGN OVERVIEW

The following list details the steps used to carry out this study. Following the list, the details about data analysis and synthesis are discussed.

Prior to data collection, a review of selected literature was conducted as reported in chapters two and three. Based on this review, a conceptual framework was chosen and a specific learning module from the BOL I course was identified as the focus of this study. The conceptual framework is the five bridging techniques that Fogarty et al. (1992) developed for the instruction of thinking skills to support the transfer of learning. The a priori main codes were: 1) anticipating applications, 2) generalizing concepts, 3) using analogies, 4) parallel problem solving, and 5) metacognitive reflection.

a) The study proposal was presented to the senior supervisor for review and recommendations. Upon revisions by the researcher, the study proposal and accompanying consent forms were forwarded to the SFU Ethics Department and approval to proceed with this minimal risk study was received (see Appendix A).

b) Email was the selected communication method in which to deliver the invitation to participate in the study and enlist cooperation from the three groups of research participants.

c) Once the BOL I sessions that were being investigated had concluded, the researcher applied qualitative content-analysis methodology based on the deductive a priori main codes to analyse the data of the student research participants. These data were the online discussions (from WebCT) of the student research participants in the BOL I course and gave evidence of the students' thinking skills as they answer the primary research question. Details of the coding process are described in chapter five.

d) Once the online discussions were coded, some sample thinking skills (excerpts) from each a priori main code were selected randomly by the researcher in order to prepare a task for the co-op employer experts and answer the second research question (see Appendix I). To complete the activity, the co-op employer experts were given written rudimentary exposure to the concept of transfer of learning, conceptual learning, and the five bridging techniques, Following this introduction, the co-op employer experts were asked to complete a task which required them to read the excerpts and indicate based on their personal perspective whether they felt that the excerpts demonstrated 'evidence for' or 'evidence against' thinking skills as relevant in a workplace context with respect to the transfer of learning. Although the co-op employer experts are not necessarily specialists in thinking skills for the transfer of learning, it was their personal view that was of interest to this study to add supplemental information about the findings to the primary research question in order to deepen the implications made regarding the BOL course.

e) Finally, the researcher held a meeting with the BOL course facilitators (drawn from the entire population of those who instruct the BOL course) to discuss the BOL course facilitator's perspectives and impressions about the thinking skills that students are using in the BOL discussions. As well, the meeting included a general discussion about how the thinking skills support the transfer of learning. The researcher documented the comments and perceptions of the BOL course facilitators.

# DATA COLLECTION METHODS

The three research questions guided the data collection methods used in order to gather the information required to inform the research problem in the most meaningful ways possible.

**Primary Data Source**

The first and primary data source was the online discussions from the student research participants. The online discussions are the responses to the reflection exercises in the Skills Transfer learning module of the BOL I course which give evidence for the thinking skills of the student research participants. The data collection method involved compiling the online discussions of the BOL sessions directly from WebCT. The importance of this data collection method to the research question was that it allowed for the collection of online discussions in the natural and non-manipulated setting, and importantly the data was collected holistically which is an important strategy in qualitative research.

The researcher observed the online discussions only upon conclusion of the BOL I course. It would have been impractical to observe the data while the critical behaviors were in progress and furthermore this would have distracted the student research participants. By accessing the online discussions upon the natural conclusion of the course, a saturated and complete recording of the phenomenon allowed for a more accurate analysis and demonstrated the clear advantage of this data collection strategy. This data collection method also circumvented a potential limitation to the study in that the researcher did not

impact the phenomenon in progress and observer effects on the credibility and dependability of the data collected were non-issues. Also, the researcher did not contaminate the data collected or make omissions in the study based on researcher fatigue or assumptions.  Since the researcher's role in data collection was limited as the online discussions were self-generated and stored in WebCT, the researcher was not personally involved thus is not required to disclose personal feelings, beliefs or experiences of participating in the data collection. However, during the interpretations of the findings, researcher subjectivity may play a role. To avoid this limitation, subjectivity audits were continuously conducted about situations connected to the research that arouse feelings, both positive and negative and these notes were recorded in the research journal. By not including subjective and personal information during the data collection, the credibility of the findings was enhanced. Finally, this method increased the dependability of the data collected as researcher biases did not impact the data collection, and a secondary observer was not required thus inter/ intra reliability issues did not surface.

**Data Management**

The management of the primary data involved extensive data preparation and data organization procedures to arrange the data for analysis.

The primary data, the online discussions from WebCT, were compiled into separate text files and were not altered in any way. These text files were duplicated and stored in a well-labelled computer file as a master copy to honor confidentiality.  The researcher then worked with a copy of the original data.

The primary data were manipulated in the following ways to prepare the data for analysis, and more specifically to preserve confidentiality and comply with the standards of privacy and anonymity:

1. The WebCT discussions were converted into text files.

2. The text files were converted into WORD files. The purpose of this was to ease the editing required to remove the HTML (hyper-text mark-up language) coding using the FIND and REPLACE tool in WORD.

3. The WORD files were edited to remove the data of those students who did not consent to participate.

4. The WORD files were edited to remove all BOL course facilitators' names and identifying markers. The BOL course facilitators' names were replaced in the document with "BOL course facilitator."

5. The WORD files were edited to remove all student research participants' names and identifying markers (including the first and last name and WebCT computing identification). All student research participants names were replaced with "STUDENT."

6. The WORD files were then converted back to text files and imported into the qualitative data analysis software tool for analysis.

**Second and Third Data Source**

The second data source was drawn from the co-op employer expert task (see Appendix I). To complete the task, the co-op employer experts were

emailed a WORD document package that included 1) an introduction about the transfer of learning, 2) definitions about conceptual learning and bridging techniques, and 3) instructions for completing an activity. The activity asked that the co-op employer experts review sample excerpts (the excerpts are the random samples from each a priori main code of students' thinking skills from the online discussions as coded in the primary research question) and indicate, based on their perceptions, whether the excerpts demonstrated 'evidence for' or 'evidence against' thinking skills that they felt relevant in a workplace context with respect to the transfer of learning. The co-op employer expert indicated this by marking a YES or NO in the appropriate EVIDENCE column. The co-op employer expert was also invited to provide comments regarding their perspectives in the COMMENTS column. Upon completion of the task, the co-op employers emailed the package back to the researcher.

The third data source was drawn from a meeting with the BOL course facilitators. All facilitators who instruct the BOL course were invited to attend a Fall 2009 debrief and discussion session about the BOL program. The agenda for the meeting contained the regular BOL meeting agenda items plus included two other discussion items. The first discussion item intended to gather information about the BOL course facilitator's perspectives and impressions about the thinking skills that students are using in the BOL discussions. The second discussion item was a general discussion about how the thinking skills support the transfer of learning.  The researcher took detailed notes and documented the BOL course facilitators' comments and perceptions.

Drawing on the BOL course facilitators and co-op employer experts as data sources provided important perspectives on the primary research question. The second research question aimed to provide support for the primary research question by giving a deeper understanding about the thinking skills valued in the workplace with respect to the transfer of learning. The third research question informed the primary research question by providing further support related to how co-op students give evidence for the thinking skills in the BOL I course. The co-op employer experts and BOL course facilitators have an important partnership with the educational institution as each partner contributes to the students' learning (Groenewald, 2004).

## ANALYSIS AND SYNTHESIS

This section describes the data analysis and synthesis procedures used in this study.

### Primary Data Source

Once the primary data had been imported into HyperRESEARCH, a qualitative data analysis software tool, the researcher began to review all the raw data in its entirety and thought about the big ideas and data as a whole. As the researcher read through the raw data, notes and impressions were recorded in a research journal. About two weeks later, to allow for a fresh set of eyes, the researcher re-read all the raw data once more and again the researcher recorded any impressions made about the data.

Given that Fogarty et al.'s (1992) definitions of the five bridging techniques are lengthy, the five bridging techniques served as the a priori main codes and the researcher parsed the main codes into sub-codes. A codebook was developed to give explicit definitions, and examples and coding rules for each sub-code in order to determine "exactly under what circumstances a text passage can be coded with a category" (Mayring, 2000, p. 7). The codebook is presented in Appendix G.

The researcher began the analysis process by using the a priori sub-codes to code, manage, and organize the analysis. HyperRESEARCH was used for assisting the qualitative data analysis as the tool enabled data coding and manipulation and has utility in storing, searching, sorting, and indexing (coding) the data. Additionally, HyperRESEARCH makes the codes readily retrievable as the notation designates the code's position in the original text. However, the responsibility for analysis of the data resides with the researcher.

Throughout the coding process, four different versions of the codebook were created; the coding structure and process will be further detailed in the next chapter as they constitute findings. To arrive at the different versions of the codebook, constant comparison was used where units of analysis with similar codes were compared to serve as a formative check of dependability. Constant comparison was the continual process of camping segments within and across codes until satisfactory closure was achieved on meaning of codes which also sharpened the distinctions between codes (Gall, Borg, & Gall, 1996). Constant comparison allowed the researcher to also consider the distinctiveness of the

sub-codes within an a priori main code and consider the possibility that some segments may not fit the definitions; this allowed for consistency and accuracy in the application of the codes.

To further stabilize and increase the internal credibility of the coding structure given to the online discussions, another person also coded a sample of the data. The person was the researcher's senior supervisor and was familiar with the study and is a professor in the Faculty of Education at SFU. Details of the inter-rater processes and agreement percentages are reported in the next chapter. Percentage of agreement versus Cohen's kappa was selected for this study based on evidence presented in the literature and a thorough discussion between the researcher and her supervisor. Cohen's kappa is typically the standard measure of inter-rater reliability for qualitative methods, this also noted by Mayring (2000). While thought to be more robust than percentage calculations because it accounts for agreement that may occur by chance, Cohen's kappa has received some criticism for its affinity to take for granted a code's frequency thus resulting in an effect that underestimates the agreement for a code that is commonly used. For these reasons, Cohen's kappa may be viewed as a cautious measure of agreement and was not employed in this study.

By the conclusion of the coding of the online discussions, ten complete and systematic scans through all the data were completed by the researcher with substantial time in between each scan. This enhanced intra-coder reliability and the internal credibility of the findings. The investment of time in coding the data may be a limitation in this study however, the approach was selected for its

comprehensive coverage. In the final scan of the data using the fourth version of the codebook the intra-coder reliability was 100%.

Once all the primary data had been analyzed and coded according to the a priori sub-codes, the researcher synthesized the data to answer the primary research question in order to present the findings in the next chapter. For the synthesis, the researcher used the functions within HyperRESEARCH to:

- compile information about the a priori main codes,

- compile information about the a priori sub-codes,

- run frequency reports about the a priori sub-codes, and

- analyze relationships between the a priori sub-codes.

The information compiled from HyperRESEARCH gave evidence for the thinking skills of the student research participants from both qualitative and quantitative perspectives and answered the primary research question. Although qualitative research does not aim to quantify the data and reduce it to numeric representations, (Bloomberg and Volpe, 2008) the frequency reports allowed for a more comprehensive look across all the primary data.

**Second and Third Data Source**

Once all the completed tasks from the co-op employer experts had been returned to the researcher, the researcher began the analysis of the second data source. The co-op employer activity was completed in a WORD document and included three columns of information, which were:

1) the excerpt of the sample thinking skill,

2) a column where the co-op employer expert indicated, based on their personal perception whether the excerpt provided 'evidence for' or 'evidence against' a thinking skill as relevant in a work context with respect to the transfer of learning, and

3) a column for comments.

To analyze this data, the researcher reviewed all the 'evidence for' and 'evidence against' ratings attributed to each excerpt (which are the sub-codes derived from the a priori main codes) and read all the comments the co-op employer experts provided.

As the excerpts had already been coded during the analysis of the primary data, the researcher was able to manually analyze the information provided by the co-op employer experts for each a priori main code. The synthesis involved sorting the excerpt column by a priori main code and then sorting by the 'evidence for' excerpts. The researcher manually added the frequency of 'evidence for' instances for each sub-code within each a priori main code to determine a percentage of agreement amongst the co-op employer experts' perceptions of thinking skills that are valued in a workplace context with respect to the transfer of learning. The comments provided by the co-op employer experts gave further qualitative support of their perception.

The analysis of the third data set involved the compilation of all the notes the researcher had recorded from the discussions with the BOL course

facilitators. This data were then analyzed manually by the researcher and coded according to the a priori main codes of the conceptual framework.

## ISSUES OF TRUSTWORTHINESS

Trustworthiness issues are the effort the researcher made to ensure that measures were taken within the study to ensure high quality outcomes and minimize mistakes and misinterpretations. Many features within this study were put in place to establish trustworthiness of the design, implementation, and analysis of this study. To borrow terms from Guba and Lincoln (1998), this section discusses issues important to trustworthiness in qualitative traditions namely, credibility, dependability, confirmability, and transferability.

### Credibility

Credibility is the idea that the account (also the presentation of the findings) truly reflects what actually happened, is accurate, and that the researcher accurately presents the research participants' statements. "The criterion of credibility (or validity) suggests whether the findings are accurate and credible from the standpoint of the researcher, the participants and the reader" (Bloomberg and Volpe, 2008, p. 86). This category is relevant to the research design and tests the credibility of the conclusions reached (Bloomberg and Volpe, 2008).

Credibility began with a review of how well aligned the methodology was to the research questions and how the methods unfolded. In this study, the methodological credibility was carefully considered to ensure the relationship

between the research design and the study's purpose, conceptual framework, research questions, and methods was upheld.  Attention was paid to the quality and rigor that the researcher used to interpret and analyze the data. For example, various strategies such as stating assumptions up front, dialoguing with committee members and colleagues, documentation and audit trail in a research journal, and multiple data sources all served to yield a fuller picture of the phenomenon under exploration. Additionally, the reader will find typos and for example spelling errors in the excerpts from the student research participants as the statements were presented verbatim and no corrections or omissions to the data were performed by the researcher.

**Dependability**

Dependability was the extent to which other researchers would arrive at similar results of the analysis using the same procedures as the original researcher. Dependability is also the reliability and consistency that the research findings can be replicated by other studies (Bloomberg and Volpe, 2008). However, since qualitative research is not based on random sample, Lincoln and Guba (1985) argued for dependability and consistency of the data collected with what was reported in the findings. The goal was to minimize mistakes and misinterpretations and as such, the researcher documented the procedures of data analysis, created a codebook with coding rules, and aimed to apply the codes consistently during analysis. According to Weber (1990) in order to "make valid inferences from the text, it is important that the classification procedure be

reliable in the sense of being consistent: Different people should code the same text in the same way" (p. 12).

Additionally, inter-rater stability was employed in this study. Two coders examined the coding process and discussed discrepancies; where discrepancies were found between the coders, the differences were reconciled and the data was re-coded.  The use of the inter-rater increased the dependability of the coding procedures which in turn augmented the internal consistency of the findings.

Finally, intra-coder reliability was employed in this study. The researcher recognizes the close association she has with the data as well as a detailed understanding of the coding scheme, thus the reported intra-coder reliability percentage may be artificially inflated and a limitation in this study. To reduce the impact that such would have an effect, the researcher took sufficient time between passes to code the data in order to circumvent this issue. Additionally, the coder developed a rigorous codebook to foster intra-coder consistency

## Confirmability

Confirmability deals with the notion of objectivity and the implication that the findings are the result of the research and not bias and subjectivity of the researcher (Bloomberg and Volpe, 2008). Having said that, absolute objectivity is challenging, so in order to adhere to this as closely as possible, the decision making process documented in the audit trail became critical (Lincoln and Guba, 1985). The audit trail in this study, which was recorded in a research journal,

documented the researcher's thinking processes and decisions made. The trail is important as Merriam (2002) described in offering transparency of the method to detail how the data were analyzed and interpreted. Ongoing reflection and other recorded memos served the purpose of offering the reader an ability to judge and assess the findings in the study.

**Transferability**

Generalizability is not the intention of this study and of qualitative methodology in general (Lincoln and Guba, 1985), however, transferability provides the reader with the opportunity to determine "whether and to what extent this particular phenomenon in this particular context can transfer to another particular context" (Bloomberg and Volpe, 2008, p. 87). The relevance resides in the context and the ability to extrapolate the findings to other such similar contexts that likely will not have identical conditions (Patton, 1990). The researcher aimed to foster transferability of the findings by providing a description of the student research participants and the setting as a basis for the reader to transfer the findings to other BOL I cohorts in general.

Another issue of transferability of this research is the extent to which the thinking skills may transfer from the specific context of the BOL I course to other contexts outside of BOL I. As such, the distinction between skill versus performance is note worthy. This study looked at the thinking skills in the context of the BOL I course and the performance of that thinking skill is limited to that context as BOL provided opportunities for the thinking skill to be exhibited. This study does not make the claim that these skills may naturally occur in other

contexts outside of BOL as the inherent definition of a 'skill' would assume that the performance may be repeated.

## LIMITATIONS

This study contained certain conditions that were limiting, some that were inherent to qualitative methodology itself and others related the research design. To minimize the impact of these limitations, their considerations are documented below.

Inherent to qualitative methodology is the concern of researcher bias and interest in the study, thus the issues of subjectivity is critical. As a staff member in the WIL unit at SFU, and more specifically as a curriculum manager, it may be suggested that researcher subjectivity for example, the desire to demonstrate BOL in a favorable light, confounded the findings. To counter this limitation, the researcher laid out assumptions at the outset of the study to consciously guide such awareness (see chapter one). Furthermore, the audit trail in the research journal minimized subjectivity.

Another limitation in traditional qualitative research is its association with exploratory and interpretative methods which may threaten the rigor of the study. However, by using a qualitative content-analysis approach and deductive coding that was grounded in a comprehensive literature review, previous research and theory as well as a priori design, the subsequent analysis of the data was systematic and a reliance on emergent coding and informal applications of qualitative methods that could provide inconsistent findings was circumvented in

this study. The a priori main code structure based on Fogarty et al. (1992) protected the content analyst from getting lost in self-serving coding of the data and from making abstractions. Additionally, the a priori main code structure supported the utility of qualitative content-analysis methods against poorly defined codes.

Another limitation inherent in the study design may be in the data collected.  The student research participants' knowledge of the study may have influenced the quality of their responses and in how they wished to be perceived. For example, the student research participants may have been guarded or over-achievers in the online discussions knowing that a researcher will be viewing the discussions.  Recognizing this limitation, the following measures were taken prior to data collection. First, the students were invited to participate in the study and understood that their choice to participate would not impact the grade (pass/fail) they received in the BOL I course. Second, all research participants were informed of the general goals of the study being to enhance co-op curriculum and that they were not being judged on the quality of their online discussions. Finally, all research participants were assured anonymity and confidentiality as all the data were safeguarded.  The data may also be limited by the student research participants' ability to convey information clearly and accurately in an online format, however, given students' general familiarity with WebCT (as no technical questions were asked of the researcher), this limitation is considered minimal.

Another example of a data collection limitation may have occurred in the information collected from the co-op employer expert activity. The activity asked

that the co-op employer experts evaluate excerpts of students' thinking skills (see Appendix I), and although they were provided with an introduction to the concept of transfer of learning and bridging techniques, this activity may be viewed as limiting since the thinking skills that the co-op employer experts were asked to evaluate were out of context ( not bound to the full context of the student's online posting ). An alternative approach to the activity would be to provide co-op employer experts with an introduction to the concept of transfer of learning and bridging techniques, and then invite them to contribute scenarios or situations that they think students will encounter when transferring their learning between academia and the workplace and from these contexts, discuss the thinking skills that they felt relevant in a workplace with respect to the transfer of learning.  This alternate activity may collect more robust information about the thinking skills that co-op employer experts value as relevant in a workplace context with respect to the transfer of learning.

A final limitation of this study was the number of student research participants that consented to participate (n= 28).  Therefore, the findings might be limited in their transferability to other similar groups because of the small sample size. As generalizability was not the goal of this study, the reader is reminded that the study is situated in a specific context and the reader should make decisions about its transferability and usefulness to other similar settings, this limitation was circumvented by providing details about the research participants and setting.

## CHAPTER SUMMARY

In summary, this chapter provided a description of qualitative research methodology and qualitative content-analysis as the approach that served the research problem and purpose and best answered the research questions. The study methods are aligned with content-analysis standards developed from scientific methods while integrating qualitative procedures such as deductive category application, an appreciation of context, and summarizing techniques. The rigorous application of qualitative methods to content-analysis contributes significant value to the use of qualitative methods in traditionally deductive approaches thus adding to the significance of this research in co-operative education. The intended significance of this study was to enhance understandings of the instructional strategies that support thinking skills required for the transfer of learning in the co-op model.

# CHAPTER FIVE: RESEARCH FINDINGS

The goal of this chapter is to present the findings of the study as they
relate to the research questions. This chapter begins with a detailed description
of the coding process for the primary data source (the online discussions) and
then presents the resulting coding structure. Following this, the results of the data
analysis are conveyed through findings statements (which are the Fogarty et al.
(1992) five bridging techniques that serve as the a priori main codes) and by
research question. The findings statements are inclusive of research participant's
qualitative statements and frequency reports.

The researcher views the report of findings in this chapter as a
presentation and objective description of the raw data that was synthesized into
information. Subsequently in the next chapter, interpretations are made about the
information presented here in an effort to move the data to knowledge.

## Establishing Coding Structure

### Primary Data, Online Discussions

Once the primary data were prepared for analysis and imported into
HyperRESEARCH, the researcher reviewed the raw data in its entirety and
thought about the big ideas and data as a whole. As the researcher read through
the data, notes were documented in a research journal. Following this, about two

weeks later, the researcher again reviewed all the raw data and documented any impressions that arose.

**First Version of the Codebook**

  The researcher began with the data analysis by applying the Fogarty et al. (1992) five bridging techniques as a priori main codes to the data. The unit of analysis was an item of information that is understood even when it is read outside of the context in which it is embedded (Gall, Borg, & Gall, 1996). The unit of analysis can be any length, a phrase within a sentence, the entire sentence, multiple sentences or a paragraph. The codes used in the first version of the codebook are presented in Table 9.

**Table 9. First Version of the Codebook**

| |
|---|
| **Anticipating Applications = AA**<br>Anticipating applications is defined as thinking about upcoming opportunities to use new ideas in a different context. Furthermore, it involves thinking about adjustments that will make the application relevant, otherwise referred to as scouting for relevant uses. In anticipating applications, diverse applications are targeted rather than assuming spontaneous transfer will occur. Some examples include asking students to predict possible applications remote from the learning context. For example, after students have practiced a thinking skill, the instruction may ask: Where might you use this or adapt it? Let's brainstorm, be creative and list the ideas and discuss some. |
| **Generalizing Concepts = GC**<br>Generalizing concepts is defined as asking students to extract the generic ideas out of a situation and encourage the use of generalizable concepts through looking for principles, big picture ideas, or underlying constructs.  Some ways of doing this is to ask students to generalize from their experience to produce widely applicable principles, rules, and ideas. An example from Fogarty et al. (1992) asks after studying the discovery of radium, ask, "What big generalizations about scientific discovery does the discovery of radium suggest? Can you support your generalizations by other evidence you know of?" |
| **Using Analogies = UA**<br>Using analogies is defined as finding, creating or analyzing analogies as well as comparing and finding similarities between situations using metaphors to make creative connections. Some ways of doing this are to engage students in finding and elaborating an analogy between a topic under study and something distinct from it. An example from Fogarty et al. (1992) asks students to compare and contrast the structure of the human circularity system with the structure of water and waste services in a city. The systematic comparison of unpacking the analogy by elaboration and extending the thinking will force the transfer of learning between different situations. |
| **Parallel Problem Solving = PPS**<br>Parallel problem solving is defined as solving problems with similar structures and content in different contexts; further, gaining an understanding for the similarities and contrasts between areas. Some ways of doing this are to engage students in solving problems with parallel structures in two different areas in order for them to gain an appreciation for the similarities and contrasts. For example, Fogarty et al. (1992) had students investigate a (non sensitive) problem in their home environment and a study problem in school, using the same problem solving strategy. The instruction helped students to draw out the parallels and differences. |
| **Metacognitive Reflection= MR**<br>Metacognitive reflection is defined as thinking about thinking; planning, monitoring and tracking one's progress, and evaluating one's thinking. Also, metacognitive reflection is being able to control one's thinking and subsequent behavior. Metacognition is being aware, strategic, and reflective in the use of thinking about thinking, and through this knowing, the learner will understand how to approach a task and how to approach it better in subsequent performances.  Some ways to do this are to prompt and support students in planning, monitoring, and evaluating their own thinking. For example Fogarty et al. (1992) suggested that after a quiz or any thought-demanding activity, students ask themselves, "What went well, what was hard, and how could I handle what was hard better next time?" |

The researcher soon realized that the five a priori main codes were far too broad in scope. The definitions of the a priori main codes were vast in range and covered many components, some that were overlapping and some distinctive. As a result, it was challenging to code the data based on these a priori main codes.

## Second Version of the Codebook

The researcher carefully reviewed the definition of each a priori main code as provided by Fogarty et al. (1992). The researcher then parsed the broad definition of each main code into statements that represented a single idea and these then became the sub-codes within each a priori main code and are presented in Table 10 below. As previously explained, the BOL course facilitator's contributions were also part of this database and as such, the researcher created a separate sub-code to signify the distinctiveness of the facilitator role, thus the facilitator role is represented by an "F".

**Table 10. Second Version of the Codebook**

| Anticipating Applications = AA | |
|---|---|
| AA1 | demonstrates thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas in different contexts |
| AA2 | demonstrates thinking about the adjustments that skills, tasks, knowledge, and/or ideas require in order to make them relevant in upcoming opportunity(s) |
| AAF | facilitator prompts targeted thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas |
| **Generalizing Concepts = GC** | |
| GC1 | demonstrates extracting generic idea out of a situation through looking for principles, rules, big picture ideas and/or underlying constructs |
| GC2 | demonstrates application of generalizable principles, rules, big picture ideas and/or underlying constructs to new context(s) |
| GCF | facilitator encourages use of generalizable concepts through looking for principles, rules, big picture ideas and/or underlying constructs |
| **Using Analogies = UA** | |
| UA1 | demonstrates finding, creating, and/or analyzing analogies |
| UA2 | unpacks the analogy by elaborating on thinking |
| UA3 | demonstrates using metaphors to compare and find similarities between situations and to make creative connections |
| UAF | facilitator prompts creation and/or elaboration of an analogy between differing contexts |
| **Parallel Problem Solving = PPS** | |
| PPS1 | demonstrates thinking about similarities and contrasts between contexts |
| PPS2 | demonstrates thinking about how to solve problems with similar structures and content in different contexts |
| PPSF | facilitators prompts drawing out the parallels and differences between contexts |
| **Metacognitive Reflection= MR** | |
| MR1 | demonstrates planning, monitoring and tracking one's progress, and evaluating one's thinking |
| MR2 | demonstrates awareness of and/ or is strategic and reflective (control one's thinking) in thinking about how metacognition may be applied in subsequent performances |
| MRF | facilitators prompts and supports planning, monitoring and evaluation of thinking |

The researcher applied the second version of the codebook to 50% of the primary data and took detailed notes during the process. This version of the codebook worked much better, however there were still gaps in that some definitions were broad in scope. The researcher made the following notes:

1. Anticipating applications a priori main code:

   a) it was important to distinguish between *general* and *specific contexts* when working with the AA1 sub-code in the anticipating application a priori main code as participants made distinctions in *specific* and *general contexts* of application and the former represents less targeted thinking when anticipating applications for the transferability of skills, tasks, knowledge, and/or ideas, and

   b) it was important to distinguish between *stating a context* for the application of skills, tasks, knowledge, and/or ideas and saying *how and why* that application is relevant as the latter demonstrates a deeper thinking process.

2. Using analogies a priori main code: the researcher referenced a dictionary to determine the distinctiveness in the definition of an *analogy* and *metaphor* and then brought this information into the codebook for the using analogies a priori main code.

   a) Analogy: a similarity between like features of two things, on which a comparison may be based.

   b) Metaphor: a figure of speech in which a term or phrase is applied to something to which it is not literally applicable in order to suggest a resemblance.

3. Parallel problem solving a priori main code:

   a) it was important to create distinctive sub-codes for *similarities* and *contrasts* as participants demonstrated evidence for one or the other, but rarely both in the same unit of analysis, and

   b) it was important to distinguish between stating either a *similarity or contrast* and *providing reasons to back up thinking processes* as the latter demonstrates a deeper thinking processes.

4. Metacognitive reflection a priori main code: this a priori main code is multi-parted in its definition and needed to be dissected into distinctive sub-codes.

**Third Version of the Codebook**

Based on the researcher's reflections on version two, the third version of the codebook is presented in Table 11.

**Table 11. Third Version of the Codebook**

| Anticipating Applications= AA | |
|---|---|
| AA1 | demonstrates thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas in different general contexts |
| AA2 | demonstrates thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas in different specific contexts |
| AA3 | demonstrates thinking about how and why skills, tasks, knowledge, and/or ideas are relevant in upcoming opportunity(s) |
| AA4 | demonstrates thinking about the adjustments that skills, tasks, knowledge, and/or ideas require in order to make them relevant in upcoming opportunity(s) |
| AAF | facilitator prompts targeted thinking about upcoming opportunity to use skills, tasks, knowledge, and/or ideas |
| **Generalizing Concepts= GC** | |
| GC1 | demonstrates extracting generic idea out of a situation through looking for principles, rules, big picture ideas and/or underlying constructs |
| GC2 | demonstrates application of generalizable principles, rules, big picture ideas and/or underlying constructs to new context (s) |
| GCF | facilitator encourages use of generalizable concepts through looking for principles, rules, big picture ideas and/or underlying constructs |
| **Using Analogies= UA** | |
| UA1 | demonstrates finding, creating, and/or analyzing analogies |
| UA2 | unpacks the analogy by elaborating on thinking |
| UA3 | demonstrates using metaphors to compare and find similarities between situations and to make creative connections |
| UAF | facilitator prompts creation and/or elaboration of an analogy between differing contexts |
| **Parallel Problem Solving= PPS** | |
| PPS1 | demonstrates thinking about similarities between contexts |
| PPS2 | demonstrates thinking about similarities between contexts and explicitly identifies overlap(s) |
| PPS3 | demonstrates thinking about contrasts between contexts |
| PPS4 | demonstrates thinking about contrasts between contexts and explicitly identifies these |
| PPS5 | demonstrates thinking about how to solve problems with similar structures and content in different contexts |
| PPSF | facilitator prompts drawing out the parallels and differences between contexts |
| **Metacognitive Reflection= MR** | |
| MR1 | demonstrates planning through thinking |
| MR2 | demonstrates self-monitoring of thinking |
| MR3 | demonstrates self-evaluation of  thinking |
| MR4 | demonstrates tracking of progress towards goal(s) |
| MR5 | demonstrates awareness of and/ or is strategic and reflective (control one's thinking) in thinking about how metacognition may be applied in subsequent performances |
| MRF | facilitator prompts and supports planning, monitoring and evaluation of thinking |

The researcher applied the third version of the codebook to 50% of the data and took detailed notes during the process. The researcher expanded the codebook to include samples of the thinking skills and coding rules. After a one week hiatus, the researcher applied the third version of the codebook to the entire data set. On another separate occasion, the researcher again applied the third version of the codebook to the entire data set. The intra-coder reliability was 100%.

The researcher was relatively pleased with the outcome of the third version of the codebook as the a priori sub-codes adequately captured the thinking skills of the student research participants. There were no duplicate codes applied to any unit of analysis, however areas did exist where codes overlapped in order to demonstrate the context of the participants' discussions.

Following the success of the third version of the codebook, the researcher prepared the inter-rater package. This package was complete with an introduction and background information about the study, definitions of the codes which was inclusive of examples and coding rules, and instructions for completing the activity. The inter-rater activity contained samples of the coded data as conducted by the researcher and were given to the inter-rater to review and determine agreement with the codes the primary coder had applied. The initial percentage of agreement between the second coder and the researcher was 81.5%.

All discrepancies were discussed and reconciled as the exploration of discrepancies is required to support and refine how the findings are stated and

subsequently synthesized (Creswell, 1998). This discussion resulted in two changes to the third version of the codebook, one minor and one major.

The minor change was in the anticipating application code, specifically to the AA3 sub-code wherein the definition warranted a slight modification. The original definition of the AA3 sub-code was "demonstrates thinking about how and why skills, tasks, knowledge, and/or ideas are relevant in a specific opportunity" and upon discussion this was changed to "demonstrates thinking about how and why skills, tasks, knowledge, and/or ideas are relevant in upcoming opportunity(s)." The change was from *specific opportunity* to *upcoming opportunity(s)* so that the sub-code would embrace more broad evidence of thinking skills.

The major change was in the metacognitive reflection a priori main code and was based on the challenge of distinguishing between *self-monitoring, self-evaluation* and *tracking of progress* in the thinking skills. It was decided by the researcher and her senior supervisor to collapse the MR2 (*self-monitoring)*, MR3 (*self-evaluation)*, and MR4 (*tracking of progress)* sub-codes as student research participants' discussions demonstrated that these metacognitive elements were occurring in parallel and could not be readily separated. Thus, the MR2 and MR3 and MR4 sub-codes were collapsed into the MR2 sub-code and the MR5 sub-code became the MR3 sub-code. These changes were reflected in the fourth version of the codebook, presented in Table 12.

Given the significant changes to metacognitive reflection in the codebook, the primary coder and the inter-rater simultaneously re-coded the MR excerpts.

The researcher and inter-rater arrived at 100% agreement of the excerpts based on the modified MR codes. As a result, the overall inter-rater agreement was 87.2%.

## Fourth Version of the Codebook

**Table 12. Fourth Version of the Codebook**

| Anticipating Applications | |
|---|---|
| **AA1** | demonstrates thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas in different general contexts |
| **AA2** | demonstrates thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas in different specific contexts |
| **AA3** | demonstrates thinking about how and why skills, tasks, knowledge, and/or ideas are relevant in an upcoming opportunity(s) |
| **AA4** | demonstrates thinking about the adjustments that skills, tasks, knowledge, and/or ideas require in order to make them relevant in an upcoming opportunity |
| **AAF** | facilitator prompts targeted thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas |
| **Generalizing Concepts** | |
| **GC1** | demonstrates extracting generic idea out of a situation through looking for principles, rules, big picture ideas and/or underlying constructs |
| **GC2** | demonstrates application of generalizable principles, rules, big picture ideas and/or underlying constructs to new context (s) |
| **GCF** | facilitator encourages use of generalizable concepts through looking for principles, rules, big picture ideas and/or underlying constructs |
| **Using Analogies** | |
| **UA1** | demonstrates finding, creating, and/or analyzing analogies |
| **UA2** | unpacks the analogy by elaborating on thinking |
| **UA3** | demonstrates using metaphors to compare and find similarities between situations and to make creative connections |
| **UAF** | facilitator prompts creation and/or of elaboration an analogy between differing contexts |
| **Parallel Problem Solving** | |
| **PPS1** | demonstrates thinking about similarities between contexts |
| **PPS2** | demonstrates thinking about similarities between contexts and explicitly identifies overlap(s) |
| **PPS3** | demonstrates thinking about contrasts between contexts |
| **PPS4** | demonstrates thinking about contrasts between contexts and explicitly identifies these |
| **PPS5** | demonstrates thinking about how to solve problems with similar structures and content in different contexts |
| **PPSF** | facilitator prompts drawing out of the parallels and differences between contexts |
| **Metacognitive Reflection** | |
| **MR1** | demonstrates planning through thinking |
| **MR2** | demonstrates self-monitoring, self-evaluation, and tracking of progress towards goal(s) through thinking |
| **MR3** | demonstrates awareness of and/ or is strategic and reflective (control one's thinking) in thinking about how metacognition may be applied in subsequent performances |
| **MRF** | facilitator prompts and supports planning, monitoring and evaluation of thinking |

The researcher then reworked the samples of the thinking skills and coding rules to create the final version of the codebook (see Appendix G). The entire data set from both BOL I courses was re-coded based on the fourth version of the codebook on two separate occasions and the intra-coder reliability was 100%.

## THE FINDINGS

The purpose of this study was to explore the transfer of learning in the Skills Transfer learning module of BOL I through an analysis of students' discussions to understand if the thinking skills exhibited were consistent with what is understood about bridging techniques that support the transfer of learning. There was a primary research question and two others as follows:

1. The primary research question is: In what ways do co-op students enrolled in BOL show evidence for the thinking skills that underpin the five bridging techniques as outlined by Fogarty, Perkins, and Barrell, (1992): 1) anticipating applications, 2) generalizing concepts, 3) using analogies, 4) parallel problem solving, and 5) metacognitive reflection that are consistent with what is understood to support the transfer of learning?

2. In what ways do co-op employer experts value the thinking skills of co-op students in the BOL course (as exhibited in the primary research question) as relevant in a workplace context with respect to the transfer of learning?

3. In what ways do the BOL course facilitators understand the thinking skills of co-op students and the transfer of learning?

To summarize the findings in a dependable and accurate manner as they

answer the research questions, the findings section is presented through finding

statements. The findings statements represent the a priori main codes of the

conceptual framework based on Fogarty et al. (1992) five bridging techniques,

and are then organized by research question within each finding statement. Each

finding statement is supported by the research participants' quotations and

frequency counts to allow the reader to better understand how the thinking skills

of the research participants were evidenced in the discussions. The reader will

find an emphasis on the participant's quotations to portray the evidence and to

capture the richness of the findings as qualitative research is "interested in the

language of the participants or texts" (Bloomberg and Volpe, 2008,p. 98).  The

chapter concludes with a summary of the key findings.

## Findings Statements

### Findings Statement 1: There was strong evidence of metacognitive reflection in the online discussions.

As stated by Fogarty et al. (1992), metacognitive reflection is defined as

thinking about thinking; planning, monitoring and tracking one's progress, and

evaluating one's thinking. Also, metacognitive reflection is being able to control

one's thinking and subsequent behavior. Metacognition is being aware, strategic,

and reflective in the use of thinking about thinking, and through this knowing, the

learner will understand how to approach a task and how to approach it better in

subsequent performances. The metacognitve reflection (MR) as an a priori main

code has the following sub-codes:

- MR1: demonstrates planning through thinking,

- MR2: demonstrates self-monitoring, self-evaluation, and tracking of progress towards goal(s) through thinking, and

- MR3: demonstrates awareness of and/ or is strategic and reflective (control one's thinking) in thinking about how metacognition may be applied in subsequent performances.

**Research Question #1**

The research participants enrolled in BOL I demonstrated strong evidence for metacognitive reflection as an a priori main code of thinking skills that support the transfer of learning. The frequency of occurrence for metacognitive reflection was 64.83% of the total thinking skills exhibited by the student research participants.  The results are presented in Table 13.

**Table 13. Findings for MR Codes**

| Code | Total Frequency of the Code (n=416) | Total Frequency of the Code (%) |
|---|---|---|
| MR1 | 86 | 20.67 |
| MR2 | 182 | 43.75 |
| MR3 | 6 | 1.44 |

The thinking skills that were used most frequently were MR2, demonstrating that research participants engaged in metacognitive reflection thinking skills about self-evaluation, this followed by MR1 which illustrates planning through thinking and finally to a much lesser extent MR3, the application of thinking skills to subsequent performance(s).

The MR2 sub-code captured participants engaging in thinking skills that demonstrate self-monitoring, self-evaluation, and tracking of progress towards goals. Some excerpts that are good examples and demonstrate evidence of MR2 thinking skills were:

> "I seem to be naturally capable at teaching something, be it an exercise or school subject that I am somewhat knowledgeable in, but I have little understanding of the way teaching is done as a science, thereby making me a little unsure how to go about teaching something one hundred percent 'properly'."

> "I am naturally good at resolving conflicts between people, and facilitating communication, but other than psych classes, I've never had instruction in psychotherapy/conflict resolution."

The second most frequently used thinking skill was MR1, where participants demonstrated planning through thinking. Some excerpts that are good examples and demonstrate evidence of MR1 thinking skills were:

> "I have taken many business courses on accounting but it seems like a difficult concept to apply in real life. I will want more hands-on experience with accounting before I can have more confidence in this area."

> "I know about how to assess the body when injured and what to do from taking kinesiology courses but I haven't been able to put that into practice on a actual injured person. I can gain more confidence about my knowledge of this by volunteering at sfu's physiotherapy clinic or hopefully through a co-op position."

Finally, in the metacognitive reflection code, MR3 was demonstrated least frequently by the research participants. This thinking skill demonstrates awareness of and/ or strategic reflection in thinking about how metacognition may be applied in subsequent performances. Some excerpts that are good examples and demonstrate evidence of MR3 thinking skills were:

"To assist in transferring my skills from one experience to a potential one, would be to think about what the foundations are in both experiences. For example, in understanding that working as a barista at Starbucks meant using listening skills and customer relations to deliver excellent service as their needs have been met, I can translate that to delivering a fitness program to a client."

"One time i reflected on something I did was when I didn't get a job after a second interview that I felt went well. After thinking about this I discovered that when answering questions about my former boss I expressed that we did not have a good relationship because of what I felt were her disrespectful acts towards myself and other employees.  This may have been seen as a negative on my part because a manager would not want to deal with someone who has had a poor relationship with a previous manager. This may have come off as me having an issue with listening to authority or following instructions without confrontation. In the future I would avoid talking about my manager in a negative way in interviews and try to deal with questions about my previous managers in a way that does not reflect badly on me as a worker."

A phenomenon that occurred with notable frequency in the data was evidence for MR2 being followed by MR1. This illustrated that research participants engaged in thinking about self-monitoring, self-evaluation, and tracking of progress towards goals, and then immediately discussed planning around this self-assessment through thinking skills. The frequency of occurrence for MR2 followed by MR1 thinking skills was 35.81% of the total thinking skills exhibited by the student research participants.

Two excerpts that are good examples and demonstrate evidence of MR2 being followed by MR1:

"I seem to be naturally capable at teaching something, be it an exercise or school subject that I am somewhat knowledgeable in, but I have little understanding of the way teaching is done as a science, thereby making me a little unsure how to go about teaching something one hundred percent 'properly'. To rectify this, I would look at the ways other people teach, study the subject a bit

more to get a firm hold on it, and practice teaching it to family or friends and see if the method works."

"I think I'm naturally good at writing, but when I hear critiques or academic discussions on the subject I often feel that there is something I'm missing. I think practice and more practice is the way to go; also having some more input from others on my work would be helpful."

**Research Question #2**

The co-op employer expert activity yielded 66.66% agreement by co-op employer experts for metacognitive reflection as a thinking skill that is valuable in a workplace context with respect to the transfer of learning.  When co-op employer experts examined the metacognitive reflection excerpts, they collectively noted the most consensus for MR2, followed by MR3, and MR1 thinking skills as valuable to the workplace.

One co-op employer expert stated that the MR2 thinking skills:

"shows a great deal of learning and application.  The individual was able to think on their feet and provided a solution to a potentially very difficult situation.   Very specific and well defined example."

According to one co-op employer expert, the MR3 thinking skills was:

"a good example.  It shows learning.  This could be applied to many other workplace situations.  A good learning experience for the student."

The comments that supported MR1 thinking skills as stated by one co-op employer experts was that the excerpt:

"demonstrates self-motivation and interest and also identifies steps towards gathering additional information/research/education. Human behavior is also an important element of any work place."

**Research Question #3**

During discussions with BOL course facilitators about BOL I, there was strong support for the importance of metacognitive reflection as a thinking skill that supports the transfer of learning. BOL course facilitators commented that:

1. students are readily able to show evidence for metacognitive reflection through discussion and reflection on their past experiences,

2. students are readily able to show evidence for metacognitive reflection through detailed self-evaluation and monitoring of the thinking they engaged with while in that situation, and

3. students are readily able to show evidence for metacognitive reflection by being able to think about how to plan for acquiring the skills or knowledge they lacked in specific situations to help their goal setting and success in future situations.

The comments made by BOL course facilitators demonstrated agreement that students were able to illustrate evidence of metacognitive thinking skills showing consistency with findings from the primary data analysis. BOL course facilitators felt that metacognitive reflection as a thinking skill was a critical element of being able to transfer one's learning to new contexts.

**Findings Statement 2: There was some evidence of anticipating applications in the online discussions.**

As stated by Fogarty et al. (1992), anticipating applications is defined as thinking about upcoming opportunities to use new ideas in a different context.

Furthermore, it involves thinking about adjustments that will make the application relevant, otherwise referred to as scouting for relevant uses. In anticipating applications, diverse applications are targeted rather than assuming spontaneous transfer will occur. The anticipating applications (AA) as an a priori main code has the following sub-codes:

- AA1: demonstrates thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas in different general contexts

- AA2: demonstrates thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas in different specific contexts

- AA3: demonstrates thinking about how and why skills, tasks, knowledge, and/or ideas are relevant in upcoming opportunity(s)

- AA4: demonstrates thinking about the adjustments that skills, tasks, knowledge, and/or ideas require in order to make them relevant in upcoming opportunity(s)

**Research Question #1**

The research participants enrolled in BOL I demonstrated some evidence for anticipating applications as an a priori main code of thinking skills that support the transfer of learning. The frequency of occurrence for anticipating applications was 14.66% of the total thinking skills exhibited by the student research participants. The results are presented in Table 14.

**Table 14: Findings for AA Codes**

| Code | Total Frequency of the Code (n=416) | Total Frequency of the Code (%) |
|------|-------------------------------------|----------------------------------|
| AA1 | 18 | 4.32 |
| AA2 | 17 | 4.09 |
| AA3 | 23 | 5.53 |
| AA4 | 1 | 0.24 |

In the anticipating applications code, the thinking skills were evidenced through the participants' ability to discuss a context that they anticipate their skills, tasks, knowledge, and/or ideas as being transferable to. The AA1, AA2, and AA3 codes represent thinking skills at increasing levels of complexity. In the AA1 code, the participant demonstrates their ability to think about an upcoming opportunity to use their skills, tasks, knowledge, and/or ideas in a general context. The general nature of this thinking skill is less complex than the more specific context that the participant demonstrated evidence for in the AA2 code. A further level of complexity was achieved in the AA3 code where the participant thought about a context of application and demonstrated how and why their skills, skills, tasks, knowledge, and/or ideas are transferable. The participants' discussions of 'how and why' in this thinking skill demonstrated a deep understanding of the transfer of learning.

The thinking skills that were used most frequently were AA3, this followed by AA1, AA2 and to a much lesser extent AA4.

Some sample excerpts that demonstrated AA3 thinking skills were:

"concise verbal skills would still be ideal for many jobs even if there isn't a lot of writing or presentation involved, because you will be able to effectively exchange with employers, co-workers and clients to discuss goals and expectations and such. For example, as a

librarian, you can clearly direct people to find the books they want, given that you have knowledge of how the books are organized."

"I did a Research Project in a Research Methods class. If I were to apply to become a Research Assistance in the field of psychology, I could transfer this skill and this task in combination with my academic knowledge. My academic experience with writing a research paper is obviously related to the position. My organizational and time management leadership skills will be beneficial for keeping with deadlines. My task as Head Cashier could transfer to this new position because as a Research Assistant, it is necessary to be detail-oriented."

Some sample excerpts that demonstrated AA2 thinking skills were:

"For scheduling i used skills such as attention to detail, organization, time management. I can transfer these skills to a different area, such as managing my finances."

"A task that I have performed in the past is using basic accounting software. This was when I went on work experience for a week during high school. Although I did not get around to learning everything about the software, I recorded numerous everyday transactions. This task transfers to many contexts, as accounting is an essential part of most organizations."

Some sample excerpts that demonstrated AA1 thinking skills were:

"I think I'm also using my skills of active listening, understanding the feelings of my customers, careful observations to prevent fraud, etc. I think all these observational skills will be helpful in any kind of situation!"

"I think the skill of time management can be transfer to most of the jobs."

As evidenced in the findings, the use of AA4 thinking skills, the ability to think about the adjustments that skills, tasks, knowledge, and/or ideas require in order to make them relevant in an upcoming opportunity was largely nonexistent with only one participant who demonstrated the AA4 thinking skill as:

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"I work with and their schedules is important if we are all working on the same program. I am good at finding the required information for these types of things on the Internet. However I don't want to jump into an environment that I'm totally unfamiliar with so I want to try and sort some of those things out during the job interview."

**Research Question #2**

The co-op employer expert activity yielded 31.25% agreement by co-op employer experts for anticipating applications as a thinking skill that is valuable in a workplace context with respect to the transfer of learning. The co-op employer experts illustrated equal consensus for AA2, AA3, and AA4 with no one thinking skill ranking the highest value, however AA1 ranked the lowest.

Consistent with the definition of the AA1 code, one employer expert commented on the sample AA1 excerpt that "new context unspecified - should be more specific about 'any kind' of situation". This corresponded to the limited level of complexity in this thinking skill and the lack of value this thinking skill had in supporting the transfer of learning that a co-op employer expert felt valuable to the workplace.

Other comments given by the co-op employer experts demonstrated the value of anticipating applications as a thinking skill for the transfer of learning in the workplace context. The comments made were that participants "shows a connection between the skill and the transfer of it" but that the co-op employer expert would "like to see more explanation regarding the actual skills required to perform these transactions and how that transfers to various contexts" and "for this to provide some evidence more explanation is necessary."

**Research Question #3**

During discussions with BOL course facilitators about BOL I, there was some support for the importance of anticipating application as a thinking skill that supports the transfer of learning. Although BOL course facilitators did not use the term 'anticipating applications' in their discussions, they commented that:

1. on some occasions, students were able to think about specific contexts they can transfer their prior skills and knowledge to,

2. on some occasions, students talked about the thinking behind how and why their prior knowledge is relevant to a new context, and

3. there is value in asking students to think about how knowledge and skills can be transferred so that they understand the concept of transfer of learning.

The comments made by BOL course facilitators suggested that students were able to show some evidence for anticipating applications as a thinking skill, and this was consistent with findings from the primary data analysis.

**Findings Statement 3: There was some evidence of parallel problem solving in the online discussions.**

As stated by Fogarty et al. (1992), parallel problem solving is defined as solving problems with similar structures and content in different contexts; further, gaining an understanding for the similarities and contrasts between areas.

The parallel problem solving (PPS) as an a priori main code has the following sub-codes:

- PPS1: demonstrates thinking about similarities between contexts

- PPS2: demonstrates thinking about similarities between contexts and explicitly identifies overlap(s)

- PPS3: demonstrates thinking about contrasts between contexts

- PPS4: demonstrates thinking about contrasts between contexts and explicitly identifies these

- PPS5: demonstrates thinking about how to solve problems with similar structures and content in different contexts

The research participants enrolled in BOL I demonstrated some evidence for parallel problem solving as an a priori main code of thinking skills that support the transfer of learning. The frequency of occurrence for parallel problem solving was 11.11% of the total thinking skills exhibited by the student research participants. The results are presented in Table 15.

**Table 15: Findings for PPS Codes**

| Code | Total Frequency of the Code (n=416) | Total Frequency of the Code (%) |
|------|-------------------------------------|----------------------------------|
| PPS1 | 9 | 2.16 |
| PPS2 | 24 | 5.77 |
| PPS3 | 3 | 0.72 |
| PPS4 | 8 | 1.92 |
| PPS5 | 1 | 0.24 |

The thinking skills that were used most frequently were PPS2, demonstrating that research participants engaged in thinking about similarities between contexts and explicitly identifies overlap(s).

Some sample excerpts that demonstrate evidence for PPS2 were:

"The two similarities are that both require a lot of patience and communication skills. An accountant may spend hours to make sure every transaction is recorded and may revise everything if one thing is incorrect. The financial statements must be clear to communicate to others the financial positon of a firm. Customer Service require being patient to all customers. If a customer is confused, he or she would go to the customer service to inquire, which is why communication skills are important."

"For my first co-op work term, I would be thrilled to be able to work at a CA (chartered accountants) firm. Comparing this to volunteering that I have done recently in which I help people register and pay their fees for language classes, I see a similarity. For both of these contexts, I would work with both numbers and people. I need to be accurate about the figures (seemingly cold, robotic process), but at the same time I have to have people skills (be warm, converse with people.)"

The PPS5 code represents a complex thinking skill in that it demonstrates thinking about how to solve problems with similar structures and content in different contexts, and this was largely nonexistent in the findings as only one participant demonstrated evidence for the PPS5 thinking skill as:

"I would say writing for a newspaper and being an event planner would give you much more, say, organization and creativity for public speech. I can only imagine what it takes to write an article to be read by the public. It isn' t just about relaying information, but adding interest and your own personality. Through something like this, I can see how you might have built a method or foundation for being media-friendly- and this I' m sure is uber-essential in the Broadcasting business."

There was some evidence for PPS1, PPS4, and PPS3 in the thinking skills of research participants. The PPS1 code represents thinking about similarities between contexts and some sample excerpts that demonstrated evidence for PPS1 were:

"My dream position would be working with the Winter Olympic Broadcasting Crew in 2010, which is my first co-op work term. My past situation was working as a writter for a newspaper and volunteering as an event planner in a Chinese concert. From my past experience, I would apply the skills of verbal and written communications and tasks of event planning to my dream co-op position. Similarities: They both require team work spirit."

"My dream position for first co-op work term is to work in an accounting company. My experience is that I had taken Bus 251 and I am taking Bus 254 now. Those two courses are about accounting. The similarities are that both of the work I want and my acadamic experience are about accounting."

PPS4 demonstrates thinking about contrasts between contexts and explicitly identifies these. Some sample excerpts that demonstrated evidence for PPS4 were:

"Although the job context of being a teacher and being a CSR is highly different, both job requires high EQ. Teachers often have to teach naughty kids and it is important for them to keep good control of their anger, just as the same way CSR needs to control their anger towards their customer."

"The dream position I would like for my first co-op job is to be a public health promoter. As a health science student, there is great emphasis placed on disease prevention and health promotion and I want the opportunity to utilize the knowledge that I have acquired as a student. The difference between these two contexts is that the co-op job will provide an opportunity to real life experiences while school work provides the theoretical foundation."

PPS3 is the thinking skill that demonstrates thinking about contrasts between contexts. A sample excerpt that demonstrated the PPS3 thinking skill was:

"However the difference between recreation and work is the level of professionalism and standards that may be required beyond the knowledge I could have at my current level."

As evidenced in the data, participants appeared to engage with the more complex thinking skill when discussing the similarities and/or contrasts in parallel problem solving examples. Participants expanded on and explicitly identified their examples of parallel problem solving more readily than just stating that similarities and/or contrasts exist. In the coding, PPS2 assumes that PPS1 is understood and PPS4 assumes that PPS3 is understood. To demonstrate this, PPS2 was found to occur before PPS1, and PPS4 before PPS3.

Furthermore, some ways in which research participants showed evidence for the thinking skills in the parallel problem solving code was through the use of the terms 'near transfer' and 'far transfer'. Participants used the term 'near transfer' which signified that they understood the contexts in the parallel problem solving example as similar. For example an excerpt that demonstrates PPS2 was:

> "My dream position for my first co-op work term is project manager for organizations such as the Canadian Mental Health Association and the BC Psychological Association. First experience: past psychology student union president. The similarities between this position and the my dream position enable me to use near transfer of tasks and skills. Near transfer tasks include event co-ordination and management of a team. A near transfer skill is networking with psychology professionals during the organization process of events; this skill is one that I would be using in my dream job. I could directly use these skills and experiences with near transfer tasks in my dream job position since they are similar to the ones needed in my dream job."

Similarly, participants used 'far transfer' which illustrated that they understand the contexts as different as would occur in the PPS3 and/or PPS4

thinking skills.  The following excerpt demonstrates both near and far transfer

thinking skills:

"Working as Java programmer or an assistant of the programmer is my first ideal co-op work. I like to implemnent human language to Java programming language and I enjoy when i got some programs to be worked properly. Since I' ve helped secondary students with intro of Java(I also learned myself too), I can apply that skills and tasks which are quite near transfer. However, as a clerk at the Post Office, it seems very far and different transfer. In programming, i found that it also needs communication skill to contact with other programmers to make it optimal or efficient. I' ve learned how to communicate with others so that I and people can easily interact each other to understand each other' s idea or concept."

The research participants enrolled in BOL I demonstrated some evidence

for the co-occurrence of the parallel problem solving and metacognitive reflection

as a priori main codes of thinking skills that support the transfer of learning. This

phenomenon demonstrated that some research participants were engaged in

thinking about self-evaluation and self-monitoring (MR2 code) while thinking

about the similarities between contexts and explicitly identifying overlap(s)

(PPS2). The frequency of occurrence for parallel problem solving and

metacognitive reflection was in 14.05% of the total thinking skills exhibited by the

student research participants.

An excerpt that demonstrated MR2 and PPS2 thinking skills was:

"I am currently in the production stages of producing my own podcast. A dream co-op position would be working as an intern for CBC radio, or for some other media company.  I have become quite multi-functional while working on my podcast. For my solo show, I am in charge of all stages of production. I scout the stories, I network my way to interviews, I write the scripts and I edit the shows.  As an intern I expect I will be doing similar things (eg. Researching stories would be a near skills transfer), except instead of overseeing all areas of production, I would only operate in one

section of the production stage. Consequently, I will be expected to have a highly specialized skill set (if hired as a writing intern, I will be expected to be especially good at writing). I won't be asked to do anything I haven't already done; the only difference is that I'll be required to be that much better. A far skills transfer in this case will be putting together and determining the direction of a story as a team (whereas in my podcast I am allowed to do/say whatever I like)."

**Research Question #2**

The co-op employer expert activity yielded 64.0% agreement by co-op employer experts for parallel problem solving as a thinking skill that supports the transfer of learning and is valuable in a workplace context with respect to the transfer of learning. The co-op employer experts illustrated the most consensus for PPS1, followed by PPS2, and gave equivalent rankings for PPS3, PPS4, and PPS5 thinking skills.

The co-op employer experts ranked the PPS1 thinking skill as the most valuable thinking skills for the transfer of learning in the workplace. Comments from the co-op employer experts that support PPS1, wherein student research participants demonstrated thinking about similarities between contexts, were "[t]hey are applying past experiences to a future position. There is value in reflecting on past experiences and how it might make one grow" and "[g]ood examples. Shows how learning can be transferred."

Similarly for PPS3, PPS4 and PPS5 thinking skills, the co-op employer experts respectively stated that:

1. "An interesting example.  Very detailed, specific and a good amount of connection between the duties, the job and how it can be transferred. Excellent." (PPS3)

2. "Identifies differences between contexts that may have an impact in various work places. While they provide some reasons, there is the aspect that the classroom learning complements their career." (PPS4)

3. "Has identified elements for success in a given occupation." (PPS5)

**Research Question #3**

During discussions with BOL course facilitators about BOL I, there was some support for the importance of parallel problem solving as thinking skills that support the transfer of learning. While BOL course facilitators recognized the value of this concept for supporting the transfer of learning, they were unclear as to how often it occurred in the BOL I discussions and stated they felt "this did not occur frequently enough." When prompted by the researcher to think about how well students compare and contrast their existing knowledge and skills with those required in a new context, BOL course facilitators stated they felt "this did happen to some extent more than discussing how to solve similar problems in different contexts."  The comments made by BOL course facilitators suggested that students showed some evidence for parallel problem solving as thinking skills in the online discussions.

**Findings Statement 4: There was limited evidence of generalizing concepts in the online discussions.**

As stated by Fogarty et al. (1992), generalizing concepts is defined as asking students to extract the generic ideas out of a situation and encourage the use of generalizable concepts through looking for principles, big picture ideas, or underlying constructs.  Generalizing concepts (GC) as an a priori main code has the following sub-codes:

- GC1: demonstrates extracting generic idea out of a situation through looking for principles, rules, big picture ideas and/or underlying constructs

- GC2: demonstrates application of generalizable principles, rules, big picture ideas and/or underlying constructs to new context(s)

**Research Question #1**

The research participants enrolled in BOL I demonstrated limited evidence for the generalizing concepts as an a priori main code of thinking skills that support the transfer of learning. The frequency of occurrence for generalizing concepts was in 7.45% of the total thinking skills exhibited by the student research participants.  The results are presented in Table 16.

**Table 16: Findings for GC Codes**

| Code | Total Frequency of the Code (n=416) | Total Frequency of the Code (%) |
|------|-------------------------------------|----------------------------------|
| GC1 | 24 | 5.77 |
| GC2 | 7 | 1.68 |

GC1, which demonstrates extracting generic idea out of a situation through looking for principles, rules, big picture ideas and/or underlying constructs is used more frequently by research participants than GC2, which demonstrates application of generalizable principles, rules, big picture ideas and/or underlying constructs to new context(s). GC2 is a more complex thinking skill than GC1 and some excerpts that demonstrated this were:

> "By recognizing patterns and seeing the bigger picture from observing smaller details of verb endings, I can use the accurate form in my writing most of the time. I'm trying to apply that to my driving by being more knowledgeable about traffic rules and patterns, and thus be able to predict changes in traffic conditions, allowing me to make the correct driving decisions. I think feeling secure in my knowledge allows me to act/react/respond to problems more confidently."

> "When working at a marketing agency, I had learned a skill that I have not heard of. In previous projects, we were always taught to first develop the idea, provide evidence that there is a demand for the service and how you will present it to management. The president, sat down with me and showed me how to first visualize the end result and to work back wards to the objectives and to actually visualize the end result. I learned after applying this skill of visualization it improved my academic performance, presentations. Visualization enabled you to mentally touch the end result see yourself speaking the words how you come across to the audience and the confidence exuded. in the past, I had only used this skill for training for snowboarding. Now I have used it in other areas in my life such as job interviews, business presentations and exams. I found it especially applicable when I came back to university after being out of it for 5 years."

Some sample excerpts that demonstrated GC1 were:

> "I took an accounting class in high school where the exams tended to be very long. The multiple choice questions would be placed at the front of the exam, and the problems requiring writing and problem solving at the back. The first time I did the exam, I ran out of time for the problem solving questions at the back and lost many marks as those problems constituted for most of the marks. I

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learned to manage my time wisely and to do the written, problem-solving questions first on a test. This situation helped me practice and apply some strategies that I still use today, including time management, focusing on more important things first, and looking at the big picture in anything I do."

"I think my current job gives me many opportunities to develop various skills. The most important skill I think I've learned so far is to control my emotions. At work, I often run into emotional customers and they often get upset and fustrasted when their wants cannot be met. When I encounter these customers, I've learned to control my anger even when they are arguing over something that they're wrong."

As witnessed in the excerpts, these research participants demonstrated evidence for generalizing concepts through using statements like "what I've learned," "I found that," "I realized that," to point out the generalizable strategy that follows their discussion of a situation from which the generalizable concepts were drawn.

The frequency of occurrence of generalizing concepts and metacognitive reflection as a priori main codes of thinking skills that support the transfer of learning was 30.09% of the total thinking skills exhibited by the student research participants.  This phenomenon demonstrated evidence that research participants were engaged in thinking about self-evaluation and self-monitoring while thinking about the generic ideas, principles, rules, big picture ideas and/or underlying constructs of a situation including the subsequent application of the generalizable concepts to a new contexts. An excerpt that demonstrated MR2 and GC2 thinking skills was:

"Last semester I had a group assignment to write a research paper. We divided up the work equally among all members so we could work on it individually. The plan was that everyone was going to

send their finished part of the assignment to me, where I would fit them nicely together. On the night before it was due, everyone had sent me their work except for one member. Since it was so late and contacting the member via email would take too long, I decided that I would have to do it. To calm myself I reflected on what to do next. I asked myself if I had all the information available to do the work (would I need to do more research? ), how I was going to write so much in such little time, and what resources I had access to that I could use to do the work. I learned a couple things I could use in future situations. I learned that for group assignments especially, it would be wise to complete the assignment earlier to avoid last minute panic. From my experience, I also think that working on the assignment together as a group is much more efficient and reliable than working on it individually. Also, I've learned that it's important to get every group member's  phone number so they can be contacted immediately if there's an emergency."

**Research Question #2**

The co-op employer expert activity yielded 100% agreement by co-op employer agreement for generalizing concepts as a thinking skill that is valuable in a workplace context with respect to the transfer of learning. Some comments expressed by the co-op employer experts with respect to the generalizing concepts excerpts were that the participant "[i]dentifies skills transfer across multiple contexts" and "[t]his person certainly got a valuable life long experience that they applied to other areas of their life."

**Research Question #3**

During discussions with BOL course facilitators about BOL I, the comments made by BOL course facilitators suggested that students show limited evidence for generalizing concepts as a thinking skill in the online discussions. BOL course facilitators stated that students do not readily demonstrate this

concept in the online discussions and felt that students did not understand the importance of this thinking skill.

**Findings Statement 5: There was weak evidence of using analogies in the online discussions.**

As stated by Fogarty et al. (1992), using analogies is defined as finding, creating or analyzing analogies as well as comparing and finding similarities between situations using metaphors to make creative connections. The using analogies (UA) as an a priori main code has the following sub-codes:

- UA1: demonstrates finding, creating, and/or analyzing analogies

- UA2: unpacks the analogy by elaborating on thinking

- UA3: demonstrates using metaphors to compare and find similarities between situations and to make creative connections

**Research Question #1**

The research participants enrolled in BOL I demonstrated weak evidence for the using analogies as an a priori main code of thinking skills that support the transfer of learning. The frequency of occurrence for using analogies was 1.63% of the total thinking skills exhibited by the student research participants. The results are presented in Table 17.

**Table 17: Findings for UA Codes**

| Code | Total Frequency of the Code (n=416) | Total Frequency of the Code (%) |
|------|------|------|
| UA1 | 0 | 0 |
| UA2 | 3 | 0.72 |
| UA3 | 3 | 0.72 |

Research participants illustrated no evidence for UA1 which would have demonstrated thinking skills about finding, creating, and/or analyzing analogies. Research participants did however demonstrate using UA2 and UA3 thinking skills to the same extent. UA2 codes represent the participants' ability to unpack the analogy by elaborating on thinking, and assumes that the thinking skill of UA1 are understood as UA2 is a more complex thinking skill than merely stating an analogy as would be represented by UA1. Some sample excerpts that demonstrated UA2 thinking skills were:

> "Skills transfer is like marketing.  You might not be selling the perfect product, but you must still insist that it is what the customer need.  Similarly, you might not have all the skills the employer is looking for.  However, you can let him know you can adapt and you do have what it takes to take the position."

> "The physiotherapy plays a similar role as a coach in sports. You need to be sensitive to understand the clients' limits and know how to empower them through the healing process. "

UA3 codes demonstrated using metaphors to compare and find similarities between situations and to make creative connections. Some sample excerpts that demonstrated UA3 thinking skills were:

> "When I listed collecting and making sense of informational details as good problem solving skills, I was thinking of myself as a visual learner who likes to look for patterns.  It helps me makes sense of things.  For example, My French is terrible because of my poor

listening and oral abilities, but I am able to memorize the many different forms of verbs. By recognizing patterns and seeing the bigger picture from observing smaller details of verb endings, I can use the accurate form in my writing most of the time."

"Going to an interview with no background knowledge about the position and the company is like wandering around in the dark. I think it's important to understand what the job is about and thus what skills are useful, and to know what the goals of the company are to see which ones you have in common."

**Research Question #2**

The findings from the co-op employer expert activity yielded 33.33% agreement by co-op employer experts for using analogies as a thinking skill that is valuable in a workplace context with respect to the transfer of learning.

There was further support that the more complex thinking skills of UA3 (this followed by UA2) wherein participants demonstrated using metaphors to compare and find similarities between situations and to make creative connections was the most valuable thinking skills for the transfer of learning as this thinking skills was ranked the highest by the co-op employer experts. The experts commented that UA3 was a "great example of how skills transfer can be thought of from a personal perspective" but that they were "[n]ot sure if the student made the connection to transfer to a work setting."

**Research Question #3**

During discussions with BOL course facilitators about BOL I, the BOL course facilitators gave weak evidence for the support of using analogies as thinking skills that support the transfer of learning. Interestingly, BOL course facilitators found this concept challenging to instruct for and were not convinced

of the role of using analogies in supporting the transfer of learning. As reported

by BOL course facilitators, this challenge confounded their ability to find evidence

for the using analogies as thinking skills in the discussions and reported that

students do not often use these thinking skills.

## Summary of Key Findings

This chapter presented the objective findings of the study. The most

evidence for the bridging thinking skills as exhibited by the student research

participants were found in the metacognitive reflection a priori main code, this

followed by anticipating applications, parallel problem solving, generalizing

concepts and finally the least evidence was found for using analogies. A

summary of the findings is presented in Table 18. Throughout the findings

chapter, and typical of qualitative research, extensive quotations taken verbatim

from the research participants were included to develop confidence in the

findings and provide the reader with an accurate representation of the findings in

the most objective way possible. The researcher's interpretations of these

findings are found in the next chapter.

**Table 18. Summary of Research Findings**

**Metacognitive Reflection**

1.  The frequency of occurrence for metacognitive reflection was 64.83% of the total thinking skills exhibited by the student research participants.

2.  The frequency of occurrence for MR2 followed by MR1 thinking skills was 35.81% of the total thinking skills exhibited by the student research participants.

3.  The co-op employer expert activity yielded 66.66% agreement by co-op employer experts for metacognitive reflection as a thinking skill that is valuable in a workplace context with respect to the transfer of learning.

4.  The comments made by BOL course facilitators demonstrated agreement that students were able to illustrate evidence of metacognitive thinking skills showing consistency with findings from the primary data analysis. BOL course facilitators also cited metacognitive thinking skills important for supporting the transfer of learning.

**Anticipating Applications**

1.  The frequency of occurrence for anticipating applications was 14.66% of the total thinking skills exhibited by the student research participants.

2.  The co-op employer expert activity yielded 31.25% agreement by co-op employer experts for anticipating applications as a thinking skill that is valuable in a workplace context with respect to the transfer of learning.

3.  The comments made by BOL course facilitators suggested that students were able to show some evidence for anticipating applications as a thinking skill showing consistency with findings from the primary data analysis.

**Parallel Problem Solving**

1.  The frequency of occurrence for parallel problem solving was 11.11% of the total thinking skills exhibited by the student research participants.

2.  The frequency of occurrence for parallel problem solving and metacognitive reflection was in 14.05% of the total thinking skills exhibited by the student research participants.

3.  The co-op employer expert activity yielded 64.0% agreement by co-op employer experts for parallel problem solving as a thinking skill that supports the transfer of learning and is valuable in a workplace context with respect to the transfer of learning.

4.  The comments made by BOL course facilitators suggested that students showed some evidence for parallel problem solving in the online discussions.

**Generalizing Concepts**

1. The frequency of occurrence for generalizing concepts was in 7.45% of the total thinking skills exhibited by the student research participants.

2. The frequency of occurrence of generalizing concepts and metacognitive reflection as a priori main codes of thinking skills that support the transfer of learning was 30.09% of the total thinking skills exhibited by the student research participants.

3. The co-op employer expert activity yielded 100% agreement by co-op employer experts for generalizing concepts as a thinking skill that is valuable in a workplace context with respect to the transfer of learning.

4. The comments made by BOL course facilitators suggested that students show limited evidence for generalizing concepts as a thinking skill in the online discussions.

**Using Analogies**

1. The frequency of occurrence for using analogies was 1.63% of the total thinking skills exhibited by the student research participants.

2. The findings from the co-op employer expert activity yielded 33.33% agreement by co-op employer experts for using analogies as a thinking skill that is valuable in a workplace context with respect to the transfer of learning.

3. The comments made by BOL course facilitators suggested that students were not readily able to show evidence for using analogies as thinking skills and the student's and facilitator's understanding of using analogies was not consistent with what is understood as supporting the transfer of learning.

# CHAPTER SIX: INTERPRETATIONS, CONCLUSIONS, RECOMMENDATIONS

The purpose of this chapter is to provide a discussion of the findings, highlighting insights from both a research and practice standpoint and providing a description of the meanings tied to the findings from the researcher's perspective. Given that the interpretations in this chapter are subjective, the researcher took measures such as exploring the various angles observed in the findings and documented thoughts and feelings in the research journal to arrive at a set of interpretations that were representative and aligned with the findings.

In the analysis of the findings, the researcher approached the task at varying depths. Initially, the patterns, themes, and connections in the findings from each a priori main code were critically considered with respect to what the findings meant at a deeper level. Following this, the researcher reviewed the findings as they aligned with theory that had been referenced in the literature review. Through an analysis of the findings, the elements that surfaced and framed the interpretations were:

1.  the role of the BOL course reflection exercise in cueing transfer opportunities and eliciting the thinking skills that underpin the five bridging techniques within the conceptual framework,

2.  the role of the BOL course facilitator and findings from the discussions with the BOL course facilitators, and

3. the findings from the co-op employer expert activity.

As a result of the above analytical approach, the reader will find the following sections in the interpretations: 1) reflection exercise, 2) BOL course facilitator, and 3) co-op employer experts.

This chapter concludes with a summary of the interpretations, a review of the researcher's assumptions, a note regarding the possible effects of researcher bias and limitations in the interpretations of the findings. In closing, a discussion on recommendations to improve practice are presented.

## INTERPRETATIONS

### Reflection Exercises

The reflection exercises in the BOL course are designed to cue transfer and it appears that the reflection exercises in the Skills Transfer learning module of BOL I elicited the thinking skills that underpin the five bridging techniques that support the transfer of learning as demonstrated by the findings. A closer review of the specific thinking skills that were evoked by each reflection exercise in the Skills Transfer learning module of BOL I may offer an explanation about why some thinking skills evidenced greater frequency than others did.

Of the five bridging techniques used to instruct for the transfer of learning, some were evidenced more frequently in the online discussions. The findings demonstrated that:

- the frequency of occurrence for metacognitive reflection was 64.83% of the total thinking skills exhibited by the student research participants, this was followed by

- anticipating application and parallel problem for which the frequency of occurrence was respectively 14.66% and 11.11% of the total thinking skills exhibited by the student research participants,

- at a much lesser extent generalizing concepts represented 7.45% of the total thinking skills exhibited by the student research participants, and

- weak evidence was found for using analogies which occurred in 1.63% of the total thinking skills exhibited by the student research participants.

It is probable that some of the variability that is witnessed in the frequency of the thinking skills as exhibited by the student research participants in the online discussions may be attributed to the transfer cueing affordances of the reflection exercises. The researcher used HyperRESEARCH to compile the frequency counts of each a priori sub-code within the reflection exercises in the Skills Transfer learning module in BOL I to understand which thinking skills were elicited by each reflection exercise. The results are presented in Table 19.

**Table 19. Skills Transfer Learning Module Reflection Exercises and Thinking Skills Elicited**

| Reflection Exercise in the Skills Transfer learning module in BOL I | Thinking Skill(s) Elicited | Frequency of Occurrence of Thinking Skill |
|---|---|---|
| Skills versus Tasks | anticipating application (AA) and metacognitive reflection (MR) at almost equal frequency | AA  49<br>GC  1<br>MR  59<br>PPS  1<br>UA  0 |
| Near versus Far | parallel problem solving (PPS) and metacognitive reflection(MR) | AA  5<br>GC   0<br>MR 22<br>PPS  40<br>UA 1 |
| Components of a Skill | metacognitive reflection (MR) | AA  1<br>GC  1<br>MR  127<br>PPS  0<br>UA  1 |
| Metacognition | metacognitive reflection (MR) and generalizing concepts (GC) | AA  1<br>GC  28<br>MR  30<br>PPS  1<br>UA  0 |
| Enhancing Skills Transfer | metacognitive reflection (MR) and to a much lesser evidence extent, anticipating applications (AA), parallel problem solving (PPS) and using analogies (UA) | AA  4<br>GC  1<br>MR  35<br>PPS  3<br>UA  4 |

As Table 19 demonstrates, some of the reflection exercises afforded more

opportunities for specific bridging thinking skills and this resulted in more frequent

evidence for that specific a priori main code of thinking skill over the others. Upon

examination, it appeared that the order of the most to least frequently cued

thinking skills within the reflection exercises was in the following order:

1. metacognitive reflection (MR),

2. anticipating applications (AA),

3. parallel problem solving (PPS),

4. generalizing concepts (GC), and

5. using analogies (UA).

This analysis is aligned with the prevalence of the thinking skills as evidenced in the online discussions of the student research participants. Therefore, the interpretation the researcher made is the probability that the more affordances a reflection exercise presents to students to elicit diverse thinking skills, the more prevalent the thinking skill will be in the online discussions.

For example, generalizing concepts and using analogies as thinking skills were evidenced weakly in the online discussions of the students. These thinking skills were also only elicited by only one reflection exercise in the Skills Transfer learning module of BOL I, thus it is probable that the lack of affordances to demonstrate these thinking skills is related to the limited visibility of these thinking skills in the online discussions. On the other hand, metacognitive reflection as a thinking skill was evoked by all the reflection exercises in the Skills Transfer learning module of BOL I which may explain the prevalence of this thinking skill as exhibited by the research participants in the online discussions.

**BOL Course Facilitator**

The research by Bereiter and Scardamalia (1986), Palincsar and Brown (1984), and Schoenfeld (1985) stated that in the explicit teaching of transferable thinking skills, appropriate instructional strategies are significant. For this reason, the role of the BOL course facilitators was reviewed in closer detail as another element that may be used to explain the frequency of the thinking skills exhibited by the student research participants in the online discussions. The reader is reminded that the researcher specifically coded for the BOL course facilitator data during the analysis of the primary data, and while this data was not relevant specifically in answering the primary research question, the facilitator data can be used to interpret the findings. Table 20 presents the quantitative summary of the facilitator data.

**Table 20. Facilitator Codes**

| Code | Total Frequency of the Code (n=416) | Total Frequency of the Code (%) |
|---|---|---|
| Metacognitive Reflection Facilitator | 44 | 10.12 |
| Anticipating Applications Facilitator | 10 | 2.65 |
| Parallel Problem Solving Facilitator | 13 | 3.01 |
| Generalizing Concepts Facilitator | 2 | 0.51 |
| Using Analogies Facilitator | 0 | 0 |

The BOL course facilitator's ability to encourage the use of the bridging techniques is, in the interpretation of the researcher, related to the frequency of

evidence for that thinking skill as exhibited by the student research participants in the online discussions. Upon closer inspection (as illustrated in Table 20), it can be seen that the BOL course facilitators prompted the thinking skills of:

- metacognitive reflection (MR) quite readily which likely contributed to the strong evidence of MR thinking skills in the online discussions,

- anticipating application and parallel problem solving thinking skills somewhat  equally, which likely contributed to the approximate equal evidence of these thinking skills in the online discussions (14.66% and 11.11% respectively), and

- generalizing concepts very infrequently and did not prompt using analogies which likely contributed to the weak evidence of these thinking skills as exhibited by the student research participants in the online discussions. Additionally, as reported by the BOL course facilitators they had limited understanding about the concept of using analogies to foster the transfer of learning. This evidence is consistent here with the challenge they found in instructing this bridging technique.

A great facilitation skill that was not coded for (nor was relevant to the research question) but was witnessed by the researcher was the ability of the BOL course facilitators to give effective feedback to students. This was done in ways that paraphrased and generalized (through re-framing) what students had written to highlight for the entire group of BOL students that they were on the right track for the reflection exercise and the concepts in the BOL course.

**Co-op Employer Experts**

The following quotation by Cates and Langford (1999) reiterates the
importance of thinking skills as valuable in the workplace context:

> "when filling the needs of potential employers, human resource
> representatives consistently seek potential co-op and other
> employees with good communication and thinking abilities. These
> qualities are sought after with as much intensity as good technical
> ability and high grade point averages" (p. 8).

To remind the reader, the co-op employer experts completed an activity
that asked them, based on their personal perspective, to indicate whether they
felt that specific thinking skills were or were not relevant in a work context with
respect to the transfer of learning. The co-op employer experts were given
written rudimentary exposure to the topic of transfer of learning, conceptual
learning, and the bridging techniques but the co-op employer experts were not
necessarily specialists in thinking skills for the transfer of learning. However, it
was the co-op employer expert's personal view that was of interest to this study
to add supplemental information about the findings to the primary research
question in order to deepen the implications made regarding the BOL course.

The thinking skills that were valued by the co-op employer expert as
relevant in a work context with respect to the transfer of learning are presented
below from most to least valuable:

- generalizing concepts (100% agreement),

- metacognitive reflection and parallel problem solving (66.66% and 65%
  agreement, respectively),

- using analogies thinking skills (33.33% agreement), and

- anticipating applications (31.25% agreement).

The student research participants exhibited evidence for the thinking skills in the following order of most to least prevalent:

- metacognitive reflection (64.83% of the total thinking skills),

- anticipating application and parallel problem solving (respectively, 14.66% and 11.11% of the total thinking skills),

- generalizing concepts (7.45% of the total thinking skills),

- and using analogies (1.63% of the total thinking skills).

The thinking skills that the co-op employer experts expressed (from most to least) as relevant in a work context with respect to the transfer of learning differed from the order (most to least prevalent) of the thinking skills that were exhibited by the student research participants in the online discussions.

Based on the perspective of the co-op employer experts, the interpretation may be made that the Skills Transfer learning module in the BOL I course needs to provide more affordances for specific bridging thinking skills in order to best assist the co-op student with their transition from an academic to workplace context.

To exemplify this, each a priori main code is presented in detail. Co-op employer experts unanimously agreed that generalizing concepts is a highly valuable thinking skill that supports transfer of learning in the workplace. The

reasons for supporting generalizing concepts as critical for the transfer of learning in the workplace as cited by the co-op employer experts was that generalizing concepts "talked about perceptions, attitudes and emotions in the workplace" and allowed for "dealing with conflicting instructions, learning procedures and areas of flexibility." The reader is reminded that the student research participants in the online discussions exhibited generalizing concepts in 7.45% of the total thinking skills.

Another example can be witnessed in the parallel problem solving thinking skill. The co-op employer expert viewed parallel problem solving as critical for the transfer of learning in the workplace. With respect to parallel problem solving, one employer expert stated that this thinking skill "brings up some work experience that would be essential or a pre-requisite to a career" and that PPS1 (the ability to demonstrate thinking about similarities between contexts) was the most valuable thinking skill. This report demonstrates the value employers place on parallel problem solving thinking skills wherein students identify areas of overlap between contexts and in understanding how prior experiences are valuable to the workplace. The reader is reminded of the poor exhibition of the PPS3 (demonstrates thinking about contrasts between contexts), PPS4 (demonstrates thinking about contrasts between contexts and explicitly identifies these), and PPS5 (demonstrates thinking about how to solve problems with similar structures and content in different contexts) thinking skills in the online discussions of the student research participants.

The co-op employer experts understood using analogies as thinking skills that were relevant in a work context with respect to the transfer of learning and stated that this thinking skill is a "great example of how skills transfer can be thought of from a personal perspective." However, the co-op employer experts commented that the excerpts they were reading did not exhibit the thinking skill clearly. Specifically, one co-op employer expert stated that he/she was unsure if "the student made the connection to transfer to a work setting." The limited use of using analogies as bridging thinking skills in the online discussions suggests that students did not understand this concept nor the value of this bridging technique in the transfer of learning. This is congruent with the weak evidence in using analogies as bridging thinking skills in the online discussions.

Finally, the co-op employer expert understood anticipating applications as relevant in a work context with respect to the transfer of learning because this thinking skill "shows a connection between the skill and the transfer of it." The co-op employer expert would however "like to see more explanation regarding the actual skills required to perform these transactions and how that transfers to various contexts" versus merely suggesting that a general skill is transferable to any context (as coded for by the AA1 sub-code).

Metacognitive reflection were the only thinking skills that the student research participants exhibited strongly in the online discussions and co-op employer expert felt were relevant in a work context with respect to the transfer. One co-op employer expert's comment for metacognitive reflection suggested that this thinking skill "demonstrate[s] learning from an experience. Now the

writer speculates on the reason why (which may not be the case) but is looking for self improvement." As well, another co-op employer expert stated that the value of this thinking skill is that it "demonstrates self-motivation and interest and also identifies steps towards gathering additional information/ research/ education. Human behavior is also an important element of any work place." These comments demonstrate the critical importance that co-op employer experts place on self-evaluation and thinking about planning. More specifically, the co-op employer experts valued MR2, wherein students demonstrated self-monitoring, self-evaluation, and tracking of progress towards goals through thinking as the most valuable of the thinking skills in the metacognitive reflection code, which also was the thinking skill evidenced most frequently in the online discussions of student research participants.

## Biases and Limitations

Prior to making recommendations for practice based on the above interpretations, the researcher's biases and assumptions are revisited and discussed.

Human factors in qualitative research are both its greatest strength and elemental weakness. The researcher recognized that the interpretations in this chapter are subjective in nature with respect to the claims made regarding the meaning of the data. While the researcher was not a potential bias as an instrument in data collection, it is acknowledged that the researcher may possess some biases in analyzing the findings because of her role as a

curriculum manager. To this end, the data collection and data analysis processes were documented as carefully as possible and critical reflection was a continuous process that the researcher engaged with in order to consider different possible avenues and directions for the interpretations.

A potential limitation of this study is that it did not account for between-student affects in the online discussions. Specifically, the thinking skills elicited from students' discussions amongst one another in the online discussions may have impacted subsequent thinking skills and given clues to the prevalence of specific thinking skills. Future research may be interested in investigating this relationship.

The researcher can state with confidence that her assumptions were supported through the findings and throughout the analysis of the findings. Three assumptions were outlined. First, the researcher assumed that most bridging techniques in the instruction of thinking skills for the transfer of learning can be delivered through online curriculum. Secondly, the researcher assumed that evidence of thinking skills can be readily identified through the online discussions. The final assumption was that the BOL curriculum had potential for enhancement in order to adequately deliver all five thinking skills that underpin the bridging techniques, namely using analogies.

As discussed in the interpretations, these assumptions were satisfied as it was demonstrated that the Skills Transfer learning module in BOL I provides affordances for students to exhibit the bridging thinking skills that are consistent with what is understood to support the transfer of learning.  Secondly, as

presented in the findings, the online discussions of the student research participants were effective data and were readily coded, analyzed and synthesized in order to demonstrate evidence for the five bridging techniques in the instruction of thinking skills for the transfer of learning.  Finally, as the researcher had predicted, the Skills Transfer learning module in BOL I had potential for further enhancement, particularly in the delivery of the using analogies thinking skills. However, it remains unclear whether this finding of weak evidence of using analogies is consistent with what is inherently expected as the display of this thinking skill may naturally occur quite rarely (and still be very important), however there is no existing literature or research to provide a baseline. As such, future research may be interested in following up with the students (during the site-visit) who have completed the BOL program to analyze the thinking skills that occur in the workplace. This would give a clearer understanding about whether using analogies as a thinking skill requires more cueing opportunities in the BOL course, as research on using analogies has proved to be influential to the conceptualization of cognitive transfer (Robertson, 2001).  As well this type of future research would give clarity to the limitation noted earlier in chapter four with respect to the performance of the bridging thinking skills in contexts outside of BOL I.

## Summary of the Study

The intentions that understandings generated from this study would inform current instructional strategies in the co-operative education preparatory curriculum at SFU and enhance future curriculum development in the co-

operative education program were satisfied. This knowledge adds to the body of research in this area as "little is known about what may be the best ways to convey these bridging relations" (Pea, 1987, p. 52).

From the literature review, it was understood that bridging techniques can foster the thinking skills that support the transfer of learning by making explicit for learners the conceptual connections between what has been learned and the novel application. It was demonstrated by the findings in the Skills Transfer learning module of BOL I that Fogarty et al.'s (1992) five bridging techniques were evidenced in the online discussions of the student research participants. As established in the interpretations, the findings are not attributable in solidarity to the curriculum in the Skills Transfer learning module of BOL I as the reflection exercise played a transfer cueing role in eliciting the bridging thinking skills, as did the BOL course facilitators through their ability to instruct for the bridging techniques in the online environment. As noted in the interpretations, strong alignment of these two components resulted in greater evidence of the thinking skill by the student research participants in the online discussions.

Overall, it can be suggested that the delivery of bridging techniques can be met in an online environment. A short summary of each thinking skill, finding, and interpretation is presented below.

**Metacognitive reflection**

Metacognitive reflection thinking skills were exhibited frequently in the online discussions of the student research participants and the BOL course

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facilitators felt that students were regularly able to illustrate this thinking skill. The BOL course facilitators' understanding of this concept was consistent with what is understood about the bridging techniques to support the transfer of learning. As such, BOL course facilitators were readily able to prompt students to use this thinking skill in the online discussions which potentially accounts for the high frequency of this thinking skill illustrated in the online discussions. Finally, all the reflection exercises in the Skills Transfer module in BOL I cued this thinking skill, thus potentially explaining the high frequency with which this thinking skill was elicited. The combined elements described above contributed to the prevalence of metacognitive reflection thinking skills in the Skills Transfer learning module in BOL I by the student research participants. The co-op employer experts highly valued this thinking skill as relevant to the transfer of learning in the workplace, which was aligned with the BOL course facilitators' comments and the findings in the online discussions.

**Anticipating application**

Anticipating application thinking skills were exhibited somewhat regularly in the online discussions of the research participants and the BOL course facilitators felt that students were able to regularly illustrate this thinking skill. The BOL course facilitators' understanding of this concept was somewhat consistent with what is understood about the bridging techniques to support the transfer of learning. As such, BOL course facilitators were quite able to prompt students to use this thinking skill in the online discussions which potentially accounts for the somewhat regular illustration of this thinking skill in the online

discussions. Two reflection exercises in the Skills Transfer learning module in

BOL I cued this thinking skill, thus potentially explaining the frequency with which

this thinking skill was elicited. The combined aspects described above

contributed to the somewhat regular use of anticipating application thinking skills

in the Skills Transfer learning module in BOL I by the student research

participants. The co-op employer experts mostly valued this thinking skill as

relevant to the transfer of learning in the workplace, which was aligned with the

BOL course facilitators' comments and the findings in the online discussions.

**Parallel problem solving**

Parallel problem solving thinking skills were exhibited somewhat regularly

in the online discussions of the research participants and the BOL course

facilitators felt that students were somewhat regularly able to illustrate this

thinking skill.  The BOL course facilitators' understanding of this concept was

somewhat consistent with what is understood about the bridging techniques to

supporting the transfer of learning. As such, BOL course facilitators were quite

able to prompt students to use this thinking skill in the discussions, which

potentially accounts for the frequency of this thinking skill in the online

discussions.  Two reflection exercises in the Skills Transfer module in BOL I cued

this thinking skill, thus potentially explaining the frequency with which this

thinking skill was elicited. The combined aspects described above contributed to

the somewhat regular use of parallel problem solving thinking skill in the Skills

Transfer learning module in BOL I by the student research participants. The co-

op employer experts highly valued this thinking skill as relevant to the transfer of

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learning in the workplace, a finding which was not aligned with the BOL course facilitators' comments and the findings in the online discussions.

**Generalizing concepts**

Generalizing concepts thinking skills were exhibited to a limited extent in the online discussions of the student research participants and the BOL course facilitators felt that students were only partially able to illustrate this thinking skill. The BOL course facilitators' understanding of this concept was only slightly consistent with what is understood about the bridging techniques to support the transfer of learning. As such, BOL course facilitators were only slightly able to prompt students to use this thinking skill in the online discussions, which potentially accounts for the limited illustration of this thinking skill in the online discussions.  One reflection exercises in the Skills Transfer learning module in BOL I cued this thinking skill, thus potentially explaining the limited frequency with which this thinking skill was elicited. The combined aspects described above contributed to the limited use of the generalizing concepts thinking skills in the Skills Transfer learning module in BOL I by the student research participants. The co-op employer experts highly valued this thinking skill as relevant to the transfer of learning in the workplace, a finding which was not aligned with the BOL course facilitators' comments and the findings in the online discussions.

**Using analogies**

Using analogies thinking skills were exhibited poorly in the online discussions of the student research participants and the BOL course facilitators

felt that students were not able to illustrate this thinking skill.  The BOL course facilitators' understanding of this concept was inconsistent with what is understood about the bridging techniques to support the transfer of learning. As such, BOL course facilitators were not able to prompt students to use this thinking skill in the online discussions which potentially accounts for the poor illustration of this thinking skill in the online discussions.  Only one reflection exercise in the Skills Transfer learning module in BOL I cued this thinking skill, thus potentially explaining the weak evidence for this thinking skill in the online discussions. The combined aspects described above contributed to the weak evidence of using analogies thinking skill in the Skills Transfer learning module in BOL I by students research participants. The co-op employer experts most valued this thinking skill as relevant to the transfer of learning in the workplace, a finding which was not aligned with the BOL course facilitators' comments and the findings in the online discussions.

## Recommendations

The recommendations in this section are based on the findings of this study and the interpretations made by the researcher. Knowing what the researcher knows to be true, she recommends the following actionable items:

1.  Offer more training to BOL course facilitators about the bridging techniques that support the transfer of learning to increase their understanding of the concepts and support their role, and to enhance their ability to prompt the bridging techniques, especially with respect to the use of using analogies.

2. Increase affordances in the reflection exercises in the Skills Transfer learning module in BOL I for students to demonstrate bridging thinking skills (notably anticipating applications, parallel problem solving, and using analogies).

3. Strongly increase affordances in the reflection exercises for students to demonstrate generalizing concepts thinking skills, as these skill is highly valued by the co-op employer experts in the transfer of learning to the workplace.

4. Increase affordances in the reflection exercises of the Skills Transfer learning module in BOL I for students to demonstrate AA3, which elicits thinking about how and why skills, tasks, knowledge, and/or ideas are relevant in an upcoming opportunity (this is inclusive of AA2), and less emphasis may be placed on AA1 (a lower level thinking skill) which elicits thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas in different general contexts.

5. Increase affordances in the reflection exercises of the Skills Transfer learning module in BOL I for students to demonstrate parallel problem solving thinking skills, specifically, PPS3 and PPS4 which elicit thinking about contrasts between contexts and explicitly identifies these, and PPS5 which elicits thinking about how to solve problems with similar structures and content in different contexts, as these skills are highly valued by the co-op employer expert in the transfer of learning to the workplace.

6. Ensure that the bridging thinking skills are emphasized through the BOL

   curriculum as well as throughout the co-op student's participation in the co-op

   program by referencing and making explicit notation of the bridging

   techniques that they are being asked to use (for example in the resume and

   interview topics of BOL and the workshops).

# APPENDICES

## Appendix A: Ethical Approval

SIMON FRASER UNIVERSITY
THINKING OF THE WORLD

H. Weinberg, Ph.D.
Director, Office of Research Ethics
Simon Fraser University

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Multi-Tenant Facility
Burnaby, B.C.  Canada ,  V4A 1S6
778 782 6593

ORE
Office of Research Ethics
Balancing Research
with Ethical Considerations

Approved

Date: 14 July 2009

File: [2009s0238]

Title: An Exploration of Thinking Skills in an Online Co-op Preparatory Curriculum

Course Number:

Principal Investigator (PI):  Andrea, Sator

Supervisor:  Amundsen, Cheryl

SFU Status of PI:  Graduate Student

Department:  Education

Project Risk: Minimal

Project Start Date:  14 July 2009

Project End Date:   14 July 2012

Hello Sator,

Your application has been categorized as 'minimal risk""' and  approved by the Director, Office of Research Ethics, on behalf of the Research Ethics Board in accordance with University policy

R20.0, http://www.sfu.ca/policies/research/r20-01.htm.

The Board reviews and may amend decisions made independently by the Director, Chair or Deputy Chair, at their regular monthly meetings.

Please acknowledge receipt of this Status Notification by email to: dore@sfu.ca

Please include the file number in brackets, and include brackets, as the first item in the subject line, e.g., [2009s0238]

You should get a letter shortly.  Note:   All letters are sent to the PI addressed to the Department, School or Faculty of Simon Fraser University,as it is shown in the application.  Graduate Students should check their Graduate Student Mailbox.  Letters sent to Undergraduate Students will be sent to their Faculty Supervisor.

Good luck with the project

Hal Weinberg, Ph.D.

Director, Office of Research Ethics

hal_weinberg@sfu.ca

# Appendix B: BOL Learning Objectives

**BOL I Learning Objectives**

BOL I Skills Transfer learning module learning objectives: Students should be able to:

- differentiate between skills and tasks and understand the concept of skills transfer and the components and conditions that promote the ability to move skills across contexts
- differentiate between two types of skills transfer: near transfer and far transfer and how problem solving and gap analysis foster transfer
- explain how skills and/or tasks relate to communicating their knowledge, and be able to see the difference between having a skill and being able to transfer or mobilize that skill
- practice deconstructing their skills and employer needs, then matching the two
- begin to understand the concept of metacognition and explain its role and impact on the transfer of learning
- understand some conditions that enhance the ability to move skills across contexts

BOL I Effective Communication learning module learning objectives: Students should be able to:

- understand the basic principles of active listening and effective feedback
- understand the cover letter, resume, and interview skills as job search tools that make use of, and develop their foundational communication skills
- understand and apply co-op standards to the content, format, and professional presentation of the cover letter and resume, and understand the basics of interview preparation and interviewing skills
- develop a personal resume that reflects prior experiences (for example: skills, values, talents, knowledge, abilities, and attributes) and meet industry-standard requirements
- understand personal skill set at the most foundational level
- understand effective interview preparation, performance, and follow up

**BOL II Learning Objectives**

BOL II Personal Management learning module learning objectives: Students should be able to:

- help manage themselves and their learning through self-assessment
- enhance their self-knowledge regarding personal attributes and values
- gain a better understanding of the portfolio as a tool to manage and showcase their knowledge and skills

BOL II Workplace 101 learning module learning objectives: Students should be able to:

- make a successful transition into the workplace
- be familiar with general employer expectations
- know their rights and responsibilities as a co-op student in B.C.
- recognize issues around ethics and confidentiality and better understand important considerations when making related decisions
- understand the importance of team skills, the roles and responsibilities of team members, the stages of team development, and team dynamics; recognize the characteristics of effective teams and the advantages and challenges of working in a team

# Appendix C: BOL Reflection Exercises

**BOL I Reflection Exercises**

**Skills Transfer learning module**

Topic: Skills vs. Tasks, Reflection Exercise 1
From your past experiences (personal, professional, academic, and/or volunteer), please give an example of: a) one skill you've gained and note the context in which the skill was gained, and b) one task you've performed and note the context in which the task was performed, c) now think of how the skill and the task might transfer to a very different context and write down your ideas.

Topic: Near vs. Far Transfer, Reflection Exercise 2
Think of a dream position that you'd like for your first co-op work term. Now, think of a past situation or past experience (it may be personal, professional, academic, and/or volunteer) and how you would apply the skills and tasks you've acquired in that situation to your dream co-op position. Describe some similarities between the two jobs. Hint: Far transfer must be seen as near transfer if you have made the connection.

Topic: Components of a Skill, Reflection Exercise 3
a) Think about something that you are naturally good at but have little understanding of. What would you do to increase your confidence in this ability? b) Think about something that you know a lot about but may have not applied in a real life situation. What would you do to increase your confidence in this knowledge? c) Finally, think about something you are skilled with and write that as a resume statement.

Topic:  Metacognition, Reflection Exercise 4
Provide an example of a time you reflected about something you did. Describe the situation and what questions you asked yourself about it. What did you learn and how could you use that to your advantage in future situations? Did you generate any generalizable strategies from the situation? Tip: While reviewing the postings of your peers, develop a personal list of tools/strategies that you may use to promote metacognition.

Topic: Enhancing Skills Transfer, Reflection Exercise 5
Name two things you would do to help transfer your skills. Think about how you would use this to prepare for an interview for a position that is different from anything you have done before. Hint: Using a metaphor will assist your ability to transfer your learning by seeing the shared generalizable principles between two situations. Tip: Once you've read the postings in the discussions that exemplify various generalities, you will notice how two systems often look more similar than they did at first.

**Effective Communication learning module**

Topic: Active Listening, Reflection Exercise 6
Give an example of a situation where you received well-presented feedback and an

example of a situation where you received poorly-presented feedback. Discuss how you responded to each situation. What do you think is the most important thing to remember about feedback?

Topic: My Cover Letter, Reflection Exercise 7

1) Post your cover letter. Include the source of the job posting either via a link to the website or cut/paste the job posting information. 2) Please select one peer and assess their cover letter using the Cover Letter Rubric. You may attach the Cover Letter Rubric to your written feedback.

Topic: Resume and Cover Letter, Reflection Exercise 8

What do you think employers are looking for when they review your resume? How long do they spend on your resume? Besides spelling and grammar errors, what are the most common mistakes people may make in their resumes and cover letters? Give examples of how you can avoid making these mistakes.

Topic: Effective Interviewing, Reflection Exercise 9

What advice can you give your peers about preparing for an interview? What has worked for you in the past?

**BOL II: Reflection Exercises**

**Personal Management Learning Module**

Topic: Self-Assessment, Reflection Exercise 1

Using the examples of accomplishment statements provided in this section, create and share two accomplishment statements with your peers. Ensure that your statements are clear and concise.

Topic: Self-Direction, Reflection Exercise 2

Keeping in mind what employers are seeking in general and more specifically, and what skills and knowledge employers in your discipline area desire, list what you consider to be two of your major weaknesses. Explain how you might address each of them in an interview question about weaknesses.

Topic: The Portfolio, Reflection Exercise 3

How do you choose what items to include in your external portfolio? Who is the audience? Offer some of your own guidelines that may help you decide what to include and what to leave out when you're assembling your portfolio as a presentation tool. Review the postings of your peers to develop a personal list of tools.

**Workplace 101 learning module**

Topic: First Week on the Job, Reflection Exercise 4

What kind of things should you expect your first week on a job? Discuss how you have successfully prepared yourself in the past, and/or how you will prepare yourself in the future. Select one posting, and comment on it. Attempt to improve your ideas and collectively create a comprehensive list of strategies.

Topic: Workplace Etiquette Scenario A, Reflection Exercise 5
Your supervisor is very impressed with your performance on the job and has invited you to attend a senior-management meeting with her. She's of the opinion that the exposure will help you understand how business strategies are formulated. At one point during the meeting, there was a discussion about youth and their shopping patterns. Having written a term paper on the subject last semester, you explained the basic principles underlying the consumption of fashion and luxury goods. After the meeting, your supervisor called you aside and mentioned that she thought you had overstepped your limit. In her opinion, your role was more that of an observer than a participant. Did you do anything wrong? What is the protocol to be followed at a top-level meeting? Is there a way to know when to speak up and when not to?

Topic: Workplace Etiquette Scenario B, Reflection Exercise 6

You're on a co-op work term. Work is suddenly very busy. You frequently find yourself staying back an hour longer. On two occasions you have missed the beginning of your Japanese language class that you attend after work. You have also had to cancel other appointments (volunteer meetings, dinner with family) at the last minute in order to meet a deadline at work. The last time when you had to stay back and it conflicted with your best friend's birthday party, you left work at the regular time without informing your supervisor. Your birthday is coming up and it falls on a project deadline. How are you going to deal with the situation? Which issues and policies would you consider when making your decision?

Topic: Rights and Responsibilities A, Reflection Exercise 7

Rights and responsibilities are often not as easy as following a simple set of rules. Give an example of a situation where you didn't know or were doubtful about your rights and responsibilities as an employee. What action, if any, did you take and what were the results?

Topic: Rights and Responsibilities B, Reflection Exercise 8

It's your second co-op work term and you're working as a Marketing Assistant in a three-person office – you, your supervisor, and the President of the company. In addition to the duties and responsibilities outlined in the job description, your supervisor expects you to empty the recycle bin, buy cleaning supplies for the office and kitchenette, make coffee for visitors, etc. You're not overly fond of performing these tasks and as they're not part of your job description, you don't feel that you have to. You don't want to discuss this with your supervisor as she's not the type who encourages confrontation or discussion. So far, you've been ignoring the problem, hoping it will resolve itself. Is there a better way to deal with it?

Topic: Ethics Scenario, Reflection Exercise 9

You are in your last week of work and have decided to take an inventory of your work desk (pens, notebooks, disks) including all the projects you took part in. Some of the projects you were involved in generated materials (such as brochures, web pages, and business plans) that you think would look really great in your portfolio. Which work-related items do you have the right to take? Review the responses of your peers to see how other co-op students feel.

Topic: Teams in the Workplace, Reflection Exercise 10

Do you have any remaining questions that you would like to ask regarding teams in the workplace?

## Appendix D: Student Informed Consent Form: Bridging Online (BOL) I Research

I, Andrea Sator, am the curriculum coordinator in the Work Integrated Learning Unit at Simon Fraser University and a graduate student in the Faculty of Education specializing in Education and Technology at Simon Fraser University. Currently, I am working on my Master's thesis and would like to invite you to participate in this research. The purpose of the thesis is to explore the effectiveness of one aspect of the online co-op preparatory course, Bridging Online (BOL).

If you choose to participate, I would like to view your online course discussion contributions (the data). I would only view the data upon conclusion of the BOL session once your pass/fail scores have been submitted. The data will be recorded into a data file and will not include your name or any information that could identify you thus your identity will remain completely anonymous so confidentiality is assured. Additionally, the data will be kept confidential and will only be used for the purpose of this thesis and individual information will not be made public in any way during the data collection, data analysis, and data reporting process. No reference will be made in verbal or written forms which could link your name to the research. Your participation will allow for improvements to the Co-op program.

If you agree to participate in this research, please reply to this email by copying the text below into an email and send it to Andrea Sator, ajsator@sfu.ca, as soon as you receive this email.

> **"I agree to allow observations of my online discussions in the BOL course."**

I do not foresee any potential risks or discomfort to you as a result of participating. You are free not to participate and to withdraw from participation at any time without prejudice, and as mentioned above, the collection of online contributions will be done after your BOL pass/fail scores are submitted.

If you have any questions or concerns about the research or the procedures, you may contact Andrea Sator at 778-782-6745 or email ajsator@sfu.ca. Thank you for your time!

Please direct any concerns or complaints to Dr. Hal Weinberg, Director, Office of Research Ethics at hal_weinberg@sfu.ca or 778-782-6593.

## Appendix E: Employer Informed Consent Form: Co-operative Education Research

I, Andrea Sator, am the curriculum coordinator in the Work Integrated Learning Unit at Simon Fraser University and a graduate student in the Faculty of Education specializing in Education and Technology at Simon Fraser University. Currently, I am working on my Master's thesis and would like to invite you to participate in this research. The purpose of the thesis is to explore the thinking-skills exhibited by co-op students who are participating in an online co-op preparatory course.

If you choose to participate, I would like to ask that, as a co-operative education (co-op) employer, you complete a sorting task at a time convenient to you. The sorting task will ask that you look at excerpts taken from students' online discussion postings. The excerpts are samples of thinking-skills which you will be asked to sort into piles that demonstrate *evidence for* and *evidence against* thinking-skills that you feel are valuable in a work context.

The data will be recorded without identifying information, will be kept confidential, and will only be used for this thesis. No reference will be made in verbal or written forms which could link your name to the research. Your participation will allow the Co-op program to better learn how to support the conceptual thinking-skills of co-op students.

If you agree to participate, please reply to this email by copying the text below into an email and send it to Andrea Sator, ajsator@sfu.ca, as soon as you receive this email.

> **"I agree to complete the co-op employer sorting task at a time convenient to me."**

I do not foresee any potential risks or discomfort to you as a result of participating. The total time that you would be required to participate in the sorting task is about one-half hour. You may withdraw your participation at any time without penalty.

If you have any questions or concerns about the research or the procedures, you may contact Andrea Sator at 778-782-6745 or email ajsator@sfu.ca. Thank you for your time!

Please direct any concerns or complaints to Dr. Hal Weinberg, Director, Office of Research Ethics at hal_weinberg@sfu.ca or 778-782-6593.

## Appendix F: Facilitator Informed Consent Form: Bridging Online (BOL) I Research

I, Andrea Sator, am the curriculum coordinator in the Work Integrated Learning Unit at Simon Fraser University and a graduate student in the Faculty of Education specializing in Education and Technology at Simon Fraser University. Currently, I am working on my Master's thesis and would like to invite you to participate in this research. The purpose of the thesis is to explore the effectiveness of one aspect of the online co-op preparatory course, Bridging Online (BOL).

If you choose to participate in this research, I would like to ask that I may view your online course discussions (the data) as you facilitate an upcoming BOL course.

I would only view the data upon conclusion of the BOL session. The data will be recorded into a data file and will not include your name or any information that could identify you thus your identity will remain completely anonymous so confidentiality is assured. Additionally, the data will be kept confidential and will only be used for the purpose of this thesis and individual information will not be made public in any way during the data collection, data analysis, and data reporting process. No reference will be made in verbal or written forms which could link your name to the research. Your participation will allow for improvements to the Co-op program.

If you agree to participate in this research, please reply to this email by copying the text below into an email and send it to Andrea Sator, ajsator@sfu.ca, as soon as you receive this email.

**"I agree to allow observations of my online discussions in the BOL course."**

I do not foresee any potential risks or discomfort to you as a result of participating. You are free not to participate and to withdraw from participation at any time without prejudice.

If you have any questions or concerns about the research or the procedures, you may contact Andrea Sator at 778-782-6745 or email ajsator@sfu.ca. Thank you for your time!

Please direct any concerns or complaints to Dr. Hal Weinberg, Director, Office of Research Ethics at hal_weinberg@sfu.ca or 778-782-6593.

# Appendix G: Codebook

| CODE | DEFINITION | EXAMPLE | CODING RULES |
|------|------------|---------|--------------|
| **ANTICIPATING APPLICATIONS** | | | |
| **AA1** | demonstrates thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas in different general contexts | The clear communication skill transfers easily to any job, especially one that requires being a team player. | discusses general contexts that skills are transferable to (e.g, life, school, work) |
| **AA2** | demonstrates thinking about upcoming opportunity(s) to use skills, tasks, knowledge, and/or ideas in different specific contexts | The communication skill might transfer to a lot of jobs, such as teaching. | discusses specific contexts that skills are transferable to (e,g, physiotherapy, CA, lawy) |
| **AA3** | demonstrates thinking about how and why skills, tasks, knowledge, and/or ideas are relevant in an upcoming opportunity(s) | Skills like active listening and paying attention to details can be used in almost any situations. An example could be the retail industry, because a salesman will need to know what kind of product the customer is looking for. | give evidence for the how and why of skills transfer |
| **AA4** | demonstrates thinking about the adjustments that skills, tasks, knowledge, and/or ideas require in order to make them relevant in an upcoming opportunity | Because of a lack of understanding about the level of standards in the professional industry, however, I may not be able to advance in such a career without a more in depth understanding of the expectations of the industry as far as it's standards may be concerned. | discusses changes needed in the skill set to make it relevant to a specific context |
| **AAF** | facilitator prompts targeted thinking about upcoming opportunity to use skills, tasks, knowledge, and/or ideas | If you take a closer look at your task of performing transactions for customers, what skills would you say you use to be able to perform that task? How do you think those skills would transfer to a different situation? | asks questions that prompt the learner to apply skill set to a different opportunity |
| **GENERALIZING CONCEPTS** | | | |
| **GC1** | demonstrates extracting generic idea out of a situation through looking for principles, rules, big picture ideas and/or underlying constructs | From past experience of working in groups, whether it be at work or at school, I find that giving feedback to my fellow group members and making self evaluation will greatly improve the quality of the final outcome. | states the generalizable elements of the situation |
| **GC2** | demonstrates application of generalizable principles, rules, big picture ideas and/or underlying constructs to new context (s) | I was working in the calling center of the largest Chinese insurance company in Canada, which is Manu Life. One day a French speaking person mistakenly called in and I spoke French back to him that he got a wrong number. I asked myself "if next time a Japanese called our number, can I also use Jananese to talk back with him? " I leant that knowing | gives evidence for how the generalizable element may be applied to a different situation |

| | | another language is very important. I could use this to my advantage in future situations to communicate with foreigners and translate information for them. | |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GCF | facilitator encourages use of generalizable concepts through looking for principles, rules, big picture ideas and/or underlying constructs | What are some strategies that you may be able to put in place yourself during your term to ensure you and your supervisor are on the so-called same page? | ask questions that prompt the learner to think in terms of generalizable elements |
| **USING ANALOGIES** | | | |
| UA1 | demonstrates finding, creating, and/or analyzing analogies | No examples of this in the data. | states a similarity between like features of two things, on which a comparison may be based |
| UA2 | unpacks the analogy by elaborating on thinking | I can transfer my pubilc speaking skill to the world of broadcasting. I would use this to prepare for an interview for being a reporter. I will imagine that I'm an actress who's acting as a reporter in front of the camera, then I can ignore the nervous feeling of speaking in a public place. | discusses details about the analogy and comparisons are made explicit |
| UA3 | demonstrates using metaphors to compare and find similarities between situations and to make creative connections | When I listed collecting and making sense of informational details as good problem solving skills, I was thinking of myself as a visual learner who likes to look for patterns.  It helps me makes sense of things.  For example, My French is terrible because of my poor listening and oral abilities, but I am able to memorize the many different forms of verbs.  By recognizing patterns and seeing the bigger picture from observing smaller details of verb endings, I can use the accurate form in my writing most of the time. | uses a  figure of speech in which a term or phrase is applied to something to which it is not literally applicable in order to suggest a resemblance |
| UAF | facilitator prompts creation and/or elaboration on an analogy between differing contexts | How do you think you can go about connecting the dots between data-management and communication to best prepare you for the interivew?   In what context do you feel you can raise the connection between these two during the interview as well? | asks questions that prompt the learner to think about an analogy to describe the situation |
| **PARALLEL PROBLEM SOLVING** | | | |
| PPS1 | demonstrates thinking about similarities between contexts | My dream position would be working with the Winter Olympic Broadcasting Crew in 2010, which is my first co-op work term. My past situation was working as a writer for a newspaper and volunteering as an event planner | states some general similarities between contexts |

| | | in a Chinese concert. From my past experience, I would apply the skills of verbal and written communications and tasks of event planning to my dream co-op position. Similarities: They both require team work spirit. | |
|---|---|---|---|
| **PPS2** | demonstrates thinking about similarities between contexts and explicitly identifies overlap(s) | The two similarities are that both require a lot of patience and communication skills. An accountant may spend hours to make sure every transaction is recorded and may revise everything if one thing is incorrect. The financial statements must be clear to communicate to others the financial positon of a firm. Customer Service require being patient to all customers. If a customer is confused, he or she would go to the customer service to inquire, which is why communication skills are important. | discusses in detail (how, why) the similarities between contexts |
| **PPS3** | demonstrates thinking about contrasts between contexts | Differences would be the training required for the HR position and the setting as an office and the 9-5 hours are quite different from a restaurant. | states some general contrasts between contexts |
| **PPS4** | demonstrates thinking about contrasts between contexts and explicitly identifies these | Although the job context of being a teacher and being a CSR is highly different, both job requires high EQ. Teachers often have to teach naughty kids and it is important for them to keep good control of their anger, just as the same way CSR needs to control their anger towards their customer. | discusses in detail (how, why) the contrasts between situations |
| **PPS5** | demonstrates thinking about how to solve problems with similar structures and content in different contexts | I would say writing for a newspaper and being an event planner would give you much more, say, organization and creativity for public speech. I can only imagine what it takes to write an article to be read by the public. It isn' t just about relaying information, but adding interest and your own personality. Through something like this, I can see how you might have built a method or foundation for being media-friendly- and this I' m sure is uber-essential in the Broadcasting business. | gives evidence for thinking about prior problems situations and how those solutions may be applicable to a new context |
| **PPSF** | facilitator prompts drawing out of the parallels and differences between contexts | In addition to a team work spirit, what other similarities do you see between working with the Olympic Broadcasting Crew and your past work and volunteer experiences? | asks the learner to consider the similarities and contrasts between contexts |

| | | | |
|---|---|---|---|
| **METACOGNITIVE REFLECTION** | | | |
| **MR1** | demonstrates planning through thinking | I am naturally good at resolving conflicts between people, and facilitating communication, but other than psych classes, I've never had instruction in psychotherapy/conflict resolution. To increase confidence in this ability, I would continue my current psych minor and constantly discuss and apply this knowledge amongst my colleagues | discusses thinking about a situation/ activity and the activities that are required to create a desired goal and then planning based on this thinking (i.e.: the way to approach a learning situation) |
| **MR2** | demonstrates self-monitoring, self-evaluation, and tracking of progress towards goal(s) through thinking | I often phrase questions and sentences in my head before I say them outloud, so I have a habit of thinking of the next question before I listen carefully to the response of my first question.  I will try to refrain myself from thinking when listening, and use a pause after the other party finishes speaking to piece my thoughts together, so I can maximize the information that I collect from the exchange. | discusses thinking process used in thinking about one's thinking process through being aware of the state of situation, current and past actions, judging, assessing, or appraising one' thinking at it lead to an outcome. |
| **MR3** | demonstrates awareness of and/ or is strategic and reflective (control one's thinking) in thinking about how metacognition may be applied in subsequent performances | I went to talk to the TA again and asked more detailed questions and she gave me examples so I started my second revision with a clearer idea of what was to be expected of my writing. I ended up doing much better.  I think much can be learned from this experience since I have had this occur several times during my academic years.  This can be applied to the workplace where supervisors and clients have expectations of my performance.  Understanding these expectation clearly would help with adapting and performing in the workplace | discuses metacognitive strategies and/or the applicability of metacognitive strategies to other learning situations |
| **MRF** | facilitator prompts and supports planning, monitoring and evaluation of thinking | Learning additional languages is certainly a skill that you can have, however what do you feel this may actually say about your own personal goals or attitude?  (hint, how might others have interpreted the same situation, and what might this say about your character/personality that could be attributed to many other diverse situations? ) | asks questions to prompt the learner to engage in metacognitive thinking |

## Appendix H: BOL I and Thinking Skills

A summary of how the Skills Transfer learning module in BOL I supports

the thinking skills required for the transfer of learning:

- explicitly instructs for the concept of transfer of learning,
- is a conceptual and non-experiential application of the thinking skills required to increase access to the knowledge and skills for the future transfer of learning in a social context by helping "students come to understand what they knew and could do, be able to effectively articulate what they knew and could do, and be able to mobilize their knowledge and skills across a variety of contexts" (Johnston, 2003, p. 20),
- fosters self-directed learning and thinking (implies reflective and executive abilities of planning and assessment) as the foundation from which to develop other concepts of transfer,
- instructs for and facilitates metacognitive and reflective practice and thinking in for example the Metacognition topic,
- encourages students to make purposeful and intentional meaning of experiences in for example the Skills versus Tasks and Components of a Skill topics,
- requires students to mobilize their thinking from apprehension (in terms of Kolb's 'Experiential Learning Model' ), where they think about concrete experiences or practical experiences, towards comprehension, wherein students think about abstract conceptualization or the knowledge-about stage in for example the Components of a Skill topic,
- asks students to deconstruct knowledge, abilities, skill and competencies in for example the Skills versus Tasks and Near versus Far Transfer topics,

- engages students in thinking about prior knowledge and experiences based on authentic environments (e.g., academic, personal, volunteer, and professional) in for example the Skills versus Tasks topic,
- requires students to transfer prior learning and experiences to new contexts which involves problem solving and gap analysis in for example in the Near versus Far Transfer topic, and
- instructs for the concept of generating shared principles/ thinking about generalizations to help students transfer their knowledge and apply it to diverse contexts (in terms of Kolb's 'Experiential Learning Model' wherein during the abstract conceptualization phase learners generate some general rules or principles to describe their experience, knowledge about a stage, or principles of an experience) in for example the Enhancing Skills Transfer and Metacognition topics.

## Appendix I: Co-op Employer Expert Activity

The purpose of this thesis is to explore one aspect of the online discussions of co-operative education (co-op) students who were participating in a co-op preparatory curriculum, namely the Bridging Online (BOL) program, to understand if the thinking skills that were exhibited by co-op students were consistent with what is understood about bridging techniques that support the transfer of learning. Since BOL is an online program, it aims to support students' conceptual (versus an experiential, or in context) application of the thinking skills required to increase access to the knowledge and skills for the transfer of learning.

DEFINITIONS

*Transfer of learning* examines the impact of existing knowledge, skills, strategies, and abilities on new learning and performance beyond the context of acquisition.

*Conceptual thinking skills* intend to support students in their ability to abstractly think about their skills, knowledge, and abilities so that they are able to better integrate their work and academic experiences.

*Bridging techniques* (Fogarty, Perkins, & Barrell, 1992) are complex instructional strategies that aim to support transfer of learning through the teaching of thinking skills such as 1) anticipating applications, 2) generalizing concepts, 3) using analogies, 4) parallel problem solving, and 5) metacognitive reflection.

*Anticipating applications* is defined as thinking about upcoming opportunities to use new ideas in a different context. Furthermore, it involves thinking about adjustments that will make the application relevant, otherwise referred to as scouting for relevant uses.

*Generalizing concepts* is defined as asking students to extract the generic ideas out of a situation and encourage the use of generalizable concepts through looking for principles, big picture ideas, or underlying constructs.

*Using analogies* is defined as finding, creating or analyzing analogies as well as comparing and finding similarities between situations using metaphors to make creative connections.

*Parallel problem solving* is defined as solving problems with similar structures and content in different contexts; further, gaining an understanding for the similarities and contrasts between areas.

*Metacognitive reflection* is defined as thinking about thinking; planning, monitoring and tracking one's progress, and evaluating one's thinking. Also, metacognitive reflection is being able to control one's thinking and subsequent behavior.

INSTRUCTIONS

To complete the employer expert task, please follow the instructions below (and do not hesitate to contact the researcher if you have any questions):

In the table below, please read the excerpts in the EXCERPTS column (these are postings written students and taken directly from the WebCT

discussion, thus to maintain integrity, the postings were copied verbatim and may include for example spelling errors).

Determine if you think the excerpt presents *evidence for* or *evidence against* thinking skills that are valuable in a workplace context with respect to the transfer of learning by marking a YES or NO in the EVIDENCE column.

Please provide any comments or your perspectives regarding the excerpt in the COMMENTS column.

After you've read the excerpts, look at the excerpts that you've determined as *evidence for* and in the RANK column please rank these excerpts in a manner that is representative of the most to the least (# 1= most valuable) valuable thinking skills in a workplace context with respect to the transfer of learning.

**Thank you again! My sincere gratitude for your time and energy on this task!**

| EXCERPTS | EVIDENCE<br>**Evidence for (YES)**<br>**Evidence against ( NO)** | COMMENTS | RANK |
|---|---|---|---|
| I think I'm also using my skills of active listening, understanding the feelings of my customers, careful observations to prevent fraud, etc. I think all these observational skills will be helpful in any kind of situation! | | | |
| I reflected about a particularly stressful day at work as Head Cashier. It was my responsibility to ensure that the premises opened and operated on time. I found out 30 minutes before opening that three of my cashiers and three of the cooks were not going to show up for their shift that night. In the end, I got workers to come in and I had to train 3 new cashiers and follow detailed procedures under pressure. Questions I asked myself: -What is the overall picture?  Since there are limited resources tonight and very detailed and time-consuming procedures, I will need to decide which is more important for the company: sticking strictly to the procedures or being more flexible due to the circumstances?  -What are the outcomes of my actions?  e.g. What would happen if I didn't follow this certain procedure in comparison to this other procedure?  Which one is more necessary for the situation and which one could I focus on? | | | |
| You will need to deal with people although they may not neccessarily be customers of the company.  For example, the Accounts Payable person has to deal with vendors.  Situations can get very stressful when the other party gets stubborn and does not undertand the situation from your point | | | |

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| of view and the issue becomes difficult to resolve.  Like if they charge your company a late fee when there should not be one.  Or you were told by your supervisor to hold off printing cheques because of insufficient funds but the other company 's Account Receivable is calling to ask for payment. Being able to think clearly under stressful situations is a great skill to have.  You can assess the pros and cons and make thoroughly thought-out decisions. | | | |
| Skills transfer is like marketing.  You might not be selling the perfect product, but you must still insist that it is what the customer need.  Similarly, you might not have all the skills the employer is looking for.  However, you can let him know you can adapt and you do have what it takes to take the position. | | | |
| My dream position would be working with the Winter Olympic Broadcasting Crew in 2010, which is my first co-op work term. My past situation was working as a writter for a newspaper and volunteering as an event planner in a Chinese concert. From my past experience,  I would apply the skills of verbal and written communications and tasks of event planning to my dream co-op position. Similarities: They both require team work spirit. | | | |
| The clear communication skill transfers easily to any job, especially one that requires being a team player. To get a task done in a team needs good communication to keep everyone on the same page and keep work efficient and of good quality. | | | |
| I learned from my parents and other books about psychological views of people(but not professionally) so that i | | | |

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|---|---|---|---|
| can understand from the point of other people than others. I like to research about how people think and react in a such situation. It is way different to what i am studying but i was interested so i studied by myself. I think if i take any psychological courses or meet with anyone who is in jobs or experience of that area, it will be great to discuss. | | | |
| When I listed collecting and making sense of informational details as good problem solving skills, I was thinking of myself as a visual learner who likes to look for patterns.  It helps me makes sense of things.  For example, My French is terrible because of my poor listening and oral abilities, but I am able to memorize the many different forms of verbs.  By recognizing patterns and seeing the bigger picture from observing smaller details of verb endings, I can use the accurate form in my writing most of the time. | | | |
| One time i reflected on something I did was when I didn't get a job after a second interview that I felt went well. After thinking about this I discovered that when answering questions about my former boss I expressed that we did not have a good relationship because of what I felt were her disrespectful acts towards myself and other employees. This may have been seen as a negative on my part because a manager would not want to deal with someone who has had a poor relationship with a previous manager. This may have come off as me having an issue with listening to authority or following instructions without confrontation. In the future I would avoid talking about my manager in a negative way in interviews and try to deal with questions about my previous managers in a way that does not reflect badly on me as a worker. | | | |

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| I would say writing for a newspaper and being an event planner would give you much more, say, organization and creativity for public speech. I can only imagine what it takes to write an article to be read by the public. It isn' t just about relaying information, but adding interest and your own personality. Through something like this, I can see how you might have built a method or foundation for being media-friendly- and this I' m sure is uber-essential in the Broadcasting business. | | | |
| 1.  The one coop job that would be ideal would be as a student constable. My prior job was as a Support worker at a homeless shelter.  The responsibilities of a support worker have 2 sides to the position, one as an empathetic counsellor and needs assessor and the other side of security. The counsellor side deals with the tasks of handing out food, organizing and serving meals in the dining hall to supervising the clean up of the dining hall.  these tasks would be seen as far transfer of tasks.   The Student constable responsibilities would vary from volunteer work to doing administration work for the RCMP. 2. The near transfer of things like using discretion to decide what services one of the individuals would need, as well as reading body language, delegation of tasks, effective communication, multitasking, reviewing and providing feedback to the clients on their work done as assigned. | | | |
| When working at a marketing agency, I had learned a skill that I have not heard of.  In previous projects, we were always taught to first develop the idea, provide evidence that there is a demand for the service and how you will present it to management.  The | | | |

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| president, sat down with me and showed me how to first visualize the end result and to work back wards to the objectives and to actually visualize the end result.   I learned after applying this skill of visualization it improved my academic performance, presentations.  Visualization enabled you to mentally touch the end result see yourself speaking the words how you come across to the audience and the confidence exuded.  in the past, I had only used this skill for training for snowboarding.  Now I have used it in other areas in my life such as job interviews, business presentations and exams.  I found it especially applicable when I came back to university after being out of it for 5 years. | | | |
| Differences would be the training required for the HR position and the setting as an office and the 9-5 hours are quite different from a restaurant. | | | |
| Because of a lack of understanding about the level of standards in the professional industry, however, I may not be able to advance in such a career without a more in depth understanding of the expectations of the industry as far as it's standards may be concerned. | | | |
| The dream position I would like for my first co-op job is to be a public health promoter. As a health science student, there is great emphasis placed on disease prevention and health promotion and I want the opportunity to utilize the knowledge that I have acquired as a student. The difference between these two contexts is that the co-op job will provide an opportunity to real life experiences while school work provides the theoretical foundation. | | | |

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|---|---|---|---|
| A task that I have performed in the past is using basic accounting software. This was when I went on work experience for a week during high school. Although I did not get around to learning everything about the software, I recorded numerous everyday transactions. This task transfers to many contexts, as accounting is an essential part of most organizations. | | | |

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