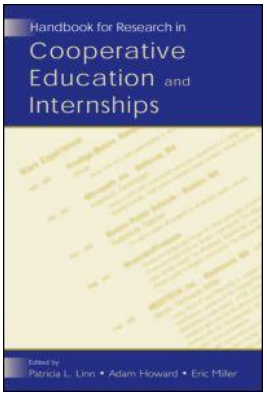

Handbook for Research in Cooperative Education and Internships

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Getting Started and Achieving Buy-In:Co-op Education Is Continuous,Contextualized Learning

Publication details
https://www.routledgehandbooks.com/doi/10.4324/9781410609434.ch3
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Published online on: 01 Sep 2003

Part II

Beginning Phase of Research Projects

3

Getting Started and Achieving Buy-In: Co-op Education Is Continuous, Contextualized Learning

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Key questions addressed in this chapter:

- How does context affect learning in co-op?
- How does one negotiate buy-in to a study from all stakeholders?
- How does co-op affect students' perceptions of learning and work?
- How do students make meaning of the co-op process?

INTRODUCTION

Learning is something we do every day. It is not restricted to the classroom or training center, although these are the traditional sites of research on learning and we have come to know quite a lot about learning in these environments. In these formal settings, we have devised ways to test the amount of learning that takes place, and we have developed a range of strategies to help people learn better. Researchers have started thinking more broadly about what affects the way people learn. We began to look beyond the content of learning to the surroundings in which it occurred. Learning context began to take on a new meaning and importance once we realized that we do not learn in isolation. Our surroundings provide a variety of cues that contribute not only to *what* we learn, but also to *how* we learn.

This chapter is about the importance of context to the what and how of learning in co-op programs. It addresses how students come to make meaning from their experience of co-op. I present findings of a study of co-op students' perceptions of learning and work. These findings indicate that the social setting—classroom or workplace—is more than mere background; it is integral to the learning process. Co-op programs combine classroom and workplace learning, alternating students between each context. As a result, through reflection and praxis (reflection-in-action), students are able to engage in what I call *continuous contextualized learning.* As an analogy, think of the Möbius strip with its single edge and continuous looping (see Fig. 3.1). The single edge represents the continuous learning that takes place as co-op students alternate between the classroom and workplace contexts (represented by the two ends of the loop).

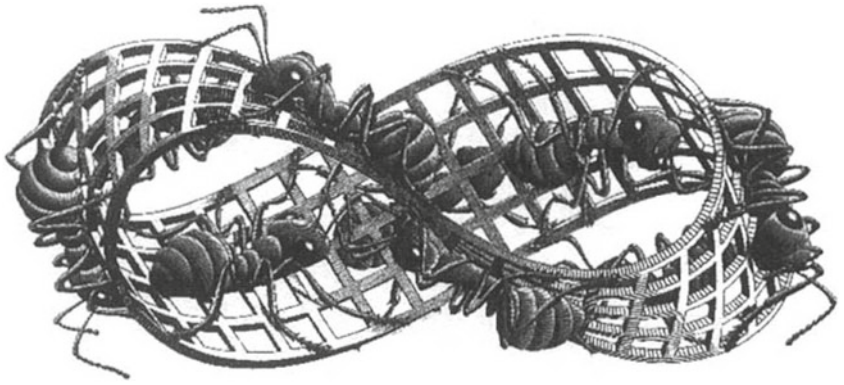

FIG. 3.1. M.C.Escher's Möbius Strip II © 2003 Cordon Art B.V.-Baarn-Holland. All rights reserved.

One goal of the chapter is to argue that the context in which a learning activity takes place is crucial to the way co-op students develop knowledge and skills. A second goal is to address the question of obtaining *buy-in* when conducting a research study. *Buy-in* means obtaining support and endorsement from individuals at all levels of the institution under consideration as a research site. Buy-in is a core requirement for a successful study, in that it is a precondition for access to key data and informants. To achieve buy-in, researchers must present projects in a way that resonates with those whose cooperation is required. Cooperation can not be mandated. Participants must perceive a benefit from taking part in the study.

I begin with a brief overview of the preparation required to undertake this study and outline my review of the literature on co-op education, learning, and context. I then describe the setting for the study, the programs and participants, and the research design. The findings I present in the final section detail how students interpret the continuous contextualized learning they experience in the co-op classroom and workplace.

PREPARING FOR MY RESEARCH STUDY

Once I decided on a topic for my research study, I needed to find out if any previous work had been done. One of the first steps in this process was to conduct a review of the research literature. There are three reasons to do a literature review before proceeding with a study: The literature indicates what research has been done in an area of interest; it also provides information on where gaps exist in current knowledge; and it provides a framework for, and establishes the importance of, a study.

In my case, I found it necessary to review a range of different types of literature before deciding where a study of contextualized learning in co-op could make a contribution.

Decision Point: Which literature should I review for my study?

- Because I was interested in studying learning in co-op education programs I began by reviewing the co-op literature.
- My initial review revealed that the majority of co-op research was confined to a small number of scholarly publications, a variety of reports and proceedings of co-op conferences, and a number of doctoral dissertations on various aspects of co-op education. I decided to concentrate on literature related to co-op's pedagogical role.
- Because I was interested in how learning happens in co-op programs, I sought out literature on learning. This area posed more of a challenge. The literature on learning is vast, and I had to keep narrowing my focus to avoid being overwhelmed by sheer volume. By restricting myself to literature that focused on the importance of context to learning, I was able to determine that my study would make a contribution in the area of workplace and classroom learning.

Co-op Education Literature

Co-op's strong practitioner orientation has produced several lines of enquiry that attempt to legitimate co-op as a pedagogically sound form of education. Studies on the impact of co-op participation on career development emphasize the importance of co-op on a student's career decisions and approach to finding a first job (Pittenger, 1993; Sharma, 1995). Studies on personal growth indicate that co-op experiences enhance students' self-confidence, values, and attitudes (Fletcher, 1990), whereas other research indicates an increase in student independence, social maturity and interpersonal skills (Fletcher, 1989; Rowe 1992; Williams, Sternberg, Rashotte, & Wagner, 1993).

Further strengthening the case for co-op, the literature asserts that co-op students get better jobs, get them faster, make more money and are, in general, well rounded and productive citizens (Petryszak & Toby, 1989; Somers, 1995;

Wessels & Pumphrey, 1995). Studies show that co-op graduates are more likely to obtain jobs related to their academic background (Brown, 1976) and that co-op students possess significantly more practical job knowledge than non-co-op students (Williams et al., 1993; Wilson, 1988). In general, co-op students display more tacit knowledge than their non-co-op counterparts, suggesting that they develop a stronger operational understanding of how and why the world of work operates as it does. Co-op's combination of classroom and workplace experience can have a demonstrable and measurable impact on co-op students in as little as 5 months (Williams et al., 1993).

Despite the importance attributed to co-op education in the literature and the positive views held about these programs by researchers, little systematic information has been collected on the experience of students as they engage with the different stages of the co-op process. Also missing from the literature are studies of the importance of context on the learning that occurs during the co-op process. In the following section, I briefly review the literature on the relation between learning and context.

Learning and Context Literature

Learning has been defined as "an active process of constructive sense-making" (Engeström, 1994, p. 9). In other words, learners construct a picture of the world and explanations of its different phenomena by "correlating and merging newly acquired material into their ongoing activity and earlier constructions" (p. 12). Although considerable research has been conducted on learning and motivation in a classroom context, less is known about learning in the workplace context. Our understanding of the skills and competencies that constitute good work performance remains limited. Likewise, we do not fully understand how skills and competencies are acquired. We do know, however, that learning is influenced by the particular context in which it occurs. But, what do we mean when we talk about context? A central and recurring theme in discussions of context is the idea of the meaning structures associated with time, place, person, and circumstance. In the classroom the context includes the curriculum, teachers and students, equipment and furnishings, and the educational institution's attitude toward education. The workplace context is a formal and professional—rather than social—setting. It includes the norms and values of the constitutive professions, equipment and machinery used for production, and a shared culture of understanding of how things are done in a particular workplace.

The context structures the learning that can occur in a particular situation because it specifies not only what can be learned and how it will be learned but also the meaning that society attributes to that learning. Think of it like this: A word in a sentence takes on specific meaning from the words that surround it and from the social context in which it is uttered. In the same way, the context that surrounds an individual in a learning situation, whether in the classroom or the workplace,

gives that learning specific meanings. What we learn, and how we learn, depends on influences embedded in the context where the experience takes place.

When students encounter a new learning situation they compare contextual information with beliefs acquired earlier. *Meaningful* learning occurs when new knowledge merges with and transforms former knowledge, resulting in a higher quality of understanding. Contextualized learning leads to deep-level learning (Engeström, 1994; Marton, Hounsell, & Entwistle, 1997). Educational programs that rotate between the classroom and the workplace allow participants to accumulate learning experiences in both contexts. Through a process of praxis or reflection-in-action, students begin to supplement previous, incomplete perceptions with more complete understandings of how the world works (Grosjean, 1999b). These understandings are then internalized as knowledge. The ways that students compare internalized knowledge with external stimuli is an individualized process—a strategy for learning. Learning strategies are one way of classifying students' approaches to learning (Ausubel, Novak, & Hanesian, 1978; Marton & Säljö, 1976; Svensson, 1977).

Theories of situated learning focus on the relationship between learning and the social contexts where learning occurs (Lave & Wenger, 1991; Wenger 1998). Learning occurs generally through experiencing the activities and cultural norms of the discipline (Lave, 1991). Co-op students move from novice toward expert through coparticipation with members of the disciplinary community. Thus, coparticipation allows for learning through performance and engagement within a community of practice rather than solely through cognitive acquisition of knowledge—the dominant mode in the academic context (Brown, Collins, & Duguid, 1989; Lave & Wenger, 1991; Rogoff, 1990).

Research on situated learning highlights the need to provide students with a realworld context for education and training, in order to prepare them for the world of work. Situated learning theory (SLT) provides a theoretical base for educational programs, like co-op, that include a workplace or experiential learning component.

Experiential learning is a key factor in the current debate on the relevance of university education. The difficulty faced by conventional graduates, in comparison to co-op graduates, in securing meaningful employment immediately upon graduation calls into question the traditional separation between academic and vocational education, that is, between the world of learning and the world of work (Matson & Matson, 1995). A widening expectations gap separates what stakeholders want from universities and what universities provide in terms of the changing opportunity structures of the labor market. Suggestions that the marketplace values graduates with real-world experience increases the demand for an experientially relevant education attuned to the shifting demands of the new economy (Business-Higher Education Forum, 1997; Grosjean, 1998).

By the time I completed the literature review, I was able to identify specific gaps in current knowledge about learning in co-op education. For example,

although co-op students are rotated between the classroom and the workplace, the literature pays little attention is to the impact of these different contexts on the way co-op students learn.

Having determined the problem I wished to address, I needed to consider the methods I would use to collect data. If I wished to conduct a study based on testing a theory, and analyzed with statistical procedures, then I would choose a quantitative method. On the other hand, if my intention was to construct a complex, holistic picture of a problem or phenomenon, then I would choose a qualitative method. A quantitative study would require the formation of hypotheses, and a random selection of participants. A qualitative study would rely on well-constructed research questions to guide the study, and a purposeful selection of participants. Before proceeding, I needed to decide whether to develop research questions or hypotheses to guide the study.

Decision Point: Do I formulate research questions or hypotheses?

- I had to decide whether I needed hypotheses or research questions. Hypotheses are useful in experimental or quasi-experimental studies where explanations of outcomes or predictions are sought. Research questions are better suited to qualitative studies that seek to interpret or understand participant experience.
- Because my study would focus on understanding and meaning-making, important information could be derived from the way students described their experiences, therefore, I required research questions to guide my study. These are the key questions listed in the box that begins the chapter.

In the remainder of this chapter, I integrate what we have discussed so far into a description of the study I conducted on contextualized learning in co-op. We begin with the setting for the study.

THE SETTING

In selecting a setting for my study, I considered the relative importance of a number of characteristics. These included accessibility and ease of entry to the site, range of programs and informants from which to choose, and the presence of a potentially rich mix of processes and constraining factors to investigate. After careful consideration, I selected Coast University (a pseudonym), as the setting for my study.

Coast University is a community of slightly more than 17,000 students, and 1,900 faculty and staff. It is located on approximately 350 acres overlooking the ocean, just 15 minutes from a major metropolitan center. The campus reflects the architectural style of the 1960s, predominantly low-rise concrete structures. In good weather, the main library and the fountain that dominate the east side of

campus are central gathering places for students. In inclement weather, they tend to congregate in the Student Union Building and the various campus cafeterias. The area's natural beauty and hospitable climate makes the campus a popular destination for undergraduates; nearly three-fourths of Coast University's registered students relocate from outside the local metropolitan area.

Coast University is ranked one of Canada's leading comprehensive universities, with a tradition of excellence in the arts and sciences. It has a well-established reputation for innovative interdisciplinary research and strong professional schools. The university is noted, as well, for its pioneering work in distance education, and support for innovative teaching. One of Coast University's distinct attractions is its extensive co-op education programs. Co-op permeates the ethos of the university, which boasts one of the largest university cooperative education programs in Canada, with co-ops in 46 academic areas. Thus, Coast University was an ideal site for my study of co-op, but access was not guaranteed. It had to be negotiated.

Decision Point: How did I get administrators to buy in to the study?

University administrators are mutually competitive and acutely aware of the relative positioning of their institutions. To gain support for my study, I researched how Coast University contributed to the overall provincial system of higher education, and how its co-op programs were perceived by employers in the region. Armed with this information, I set about convincing administrators that it was in their best interests to allow me to conduct my study at Coast University. With its broad range of co-op programs, I suggested that Coast would be a superior location to my home university with its more limited range of co-op options. Because my interest in students' perceptions of learning and work coincided with the desire of administrators to enhance Coast's profile in the province, approval was granted.

I then approached the Director of Co-op with my proposal to conduct research on how co-op students make meaning out of their co-op experience. The proposal was well received and the Director's office supported the study throughout.

THE PROGRAMS AND PARTICIPANTS

After enlisting support of the university administration and the Co-op Director, I set about selecting a representative group of co-op programs and soliciting support from co-op staff.

Decision Point: How did I persuade co-op staff to buy-in as key informants?

The first step was to convene a meeting of co-op program managers and coordinators from the various departments of the university to request their

assistance with the study. I previewed my ideas and goals with them and discussedtiming and data collection methods. Co-op staff were invited to suggest areas of investigation to include in the study. My purpose was to have them act not only as points of access and support, but also as valuable human resources to which I could repeatedly return as the study progressed. By establishing these relationships early on, I was able to limit the number of time-consuming culde-sacs encountered during data gathering. The coordinators became key informants and facilitators for my study, and as such played a valuable role in the research. For example, coordinators were instrumental in negotiations with faculty instructors to allow me to administer the student survey during regular class time.

From the broad range of programs offered at the University, I had to find a way to select those that would provide sufficient data to satisfy the parameters of the study. I developed four selection criteria. First, the stability of the program was assessed on the basis of the length of time it had been operating and the growth in work placements of students over the years. Second, I determined whether the program was voluntary or mandatory. Third, evidence was sought of a clearly defined labor market for students completing the program. Fourth, I considered whether the program adhered to the structure of disciplinary programs established by Becher (1989).

Briefly, Becher (1989) presented a rationale that suggests academic disciplines possess recognizable identities and particular cultural attributes. He pointed out that the professional language and literature of a disciplinary group play a key role in establishing its cultural identity. Therefore, each academic discipline defines and defends its own identity and intellectual territory with a variety of devices that exclude those lacking the same cultural attributes. Cultural attributes include the "traditions, customs, and practices, transmitted knowledge, beliefs, morals and rules of conduct, as well as their linguistic and symbolic forms of communication and the meanings they share" (p. 24). Becher devised a four-fold typology; hard/pure, hard/applied, soft/ pure, and soft/applied as a way of classifying the knowledge domains that underpin academic disciplinary cultures. The natural sciences and mathematics are located in the hard/pure quadrant, whereas hard/applied contains the science-based professions. The soft/applied quadrant encompasses the social professions, and the soft/pure includes the humanities and social sciences.

Because of the diverse cultures and knowledge domains in academic disciplines I reason that the experience of co-op students in different programs would vary. Although not designed as a comparative study, I nonetheless sought to investigate a broad range of student experiences. I carefully reviewed the co-op programs to find one that fit each of Becher's categories. Figure 3.2 contains selection criteria and indicates how I classified the four co-op programs according to Becher's model.

Before a study can proceed, research methods must be selected. The description of the methodology and study design that follows provides insight into how my thinking developed during the planning of the study.

Hard Pure	Soft Pure
CHEMISTRY CO-OP *established 1977* *100 placements (96/97)* *voluntary co-op* *defined labor market*	**GEOGRAPHY CO-OP** *established 1978* *210 placements (96/97)* *voluntary co-op* *mixed labor market*
Hard Applied	**Soft Applied**
ENGINEERING CO-OP *established 1983* *591 placements (96/97)* *mandatory co-op* *defined labor market*	**BUSINESS CO-OP** *established 1990* *548 placements (96/97)* *mandatory co-op* *mixed labor market*

FIG. 3.2. Co-op programs selected.

DESIGN OF THE STUDY

The research was approached as a case study (Merriam, 1988; Stake, 1995; Yin, 1994), using a combination of quantitative and qualitative methods. A survey allowed collection of information on a large number of co-op students, providing data that could be statistically manipulated to provide an overall picture of the types of students who participate in co-op and their general satisfaction with the program. Collecting this type of information is important as it allows for comparison with other co-op programs. But it sheds little light on the process of students' learning in co-op. To understand how co-op students make meaning of the process and how context affects learning I adopted an ethnographic approach that included participant observation and in-depth interviews.

As shown in Fig. 3.3 the case study contained four nested levels: (1) the university, (2) the co-op department, (3) the four individual co-op programs selected for the study, and (4) the co-op students. Participants selected for interviews represented these four constituencies. My sampling strategy was *purposeful sampling* following Patton (1990), or what LeCompte and Priessle (1993) referred to as *criterion-based selection*. Using this strategy, particular settings, persons, or events are selected deliberately in order to provide important information that might not be obtained from other sources. In other words, where required, I selected people whose comprehensive knowledge of, or involvement with, co-op education, could assist me in finding answers to my research questions. Participant interviews were tape-recorded and transcribed verbatim. Interview data was subsequently entered into a qualitative database and analyzed using Atlas.ti© software.[1]

[1] Researchers interested in computer-aided qualitative data analysis should consult Kelle (1995) or Weitzman and Miles (1995) for a review of qualitative software packages.

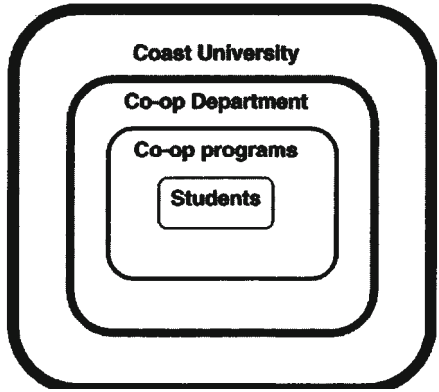

FIG. 3.3. Nested case study.

Co-op policy was assessed using university documents and analysis of interviews with senior members of the administration (n = 7). These individuals provided information that helped me understand the context within which co-op education was delivered. I conducted informal and formal interviews with faculty (n = 27), the Director of Co-op (n = 1), and co-op coordinators (n = 6) to determine whether they shared an institutional perception of the role and function of co-op education, and its place in the university structure. This background information, combined with the results of in-depth interviews with co-op students (n = 45), allowed me to begin answering the question: How does the structure of co-op education impact students' understanding of learning and work? Analysis of in-depth interviews with co-op students also helped me understand the question: How do students make meaning of the co-op process?

Following a series of pilot-tests, the student survey was administered to classes of second-year, third-year, and fourth-year students in the four programs selected for the study. Because classes in disciplines with voluntary co-op programs also contained non-co-op students, a way had to be found to obtain information from the co-op students during the subsequent interview phase, although not overtly excluding the other students.

Decision Point: Selecting student participants for the study

The decision on how to select students for the study required careful deliberation. The survey and interview questions were designed to produce data I considered relevant to an understanding of the nature and process of co-op education. The study was not designed as a comparative study to test differences between programs or between co-op and non-co-op students. Students had to complete the survey, however, before they could volunteer to participate in the interview phase of the study. Because certain classes

(those from nonmandatory co-op programs) contained co-op and non-co-op students, a practical and logistical way of administering the survey was required. During a meeting with the co-op director and the coordinators from each program, it was decided that all students in the selected classes would complete the survey, but only co-op students would be interviewed.

Because the survey was to be administered during class time it required the support and assistance of not only co-op coordinators and faculty, but also the students who would participate in the study.

Decision Point: Achieving buy-in from students

To allow students an option of participating in the study, faculty announced ahead of time the date the in-class survey would take place. On the date in question, I gave a short pitch, asking students to help me find out more about their perceptions of learning and work. I asked them to complete the survey and, if they were interested, to volunteer for confidential interviews where they could describe their experience in greater detail. None of the students in the selected classes opted out of the survey, and approximately 34% of survey participants volunteered to be interviewed.

From this number I selected a purposeful sample of 45 students. After interviewing them, I sustained their interest in the study by maintaining e-mail contact. This also allowed me to solicit further information. Additionally, I asked students to check their interview transcripts for accuracy, providing further opportunities for reinforcement and discussion.

In total, the student survey was administered to 27 classes of second, third, and fourth year, students in Business, Chemistry, Engineering, and Geography. Of the 1,040 survey forms distributed, 1,012 were complete and usable, for an adjusted completion rate of 97.3%.

Even with careful planning, there comes a point in most studies where the unanticipated strikes; when, as Robert Burns (1785/1983) put it, “The best laid schemes o’ mice and men gang aft agley.” (pp. 268–269). As described later, faculty resistance threatened to derail the project. This called for a reconsideration of planning and renegotiation of the conditions of support to allow the study to progress.

Although faculty fully understand research issues, research on co-op itself may carry little interest for them. Because co-op is not considered an academic discipline, it is marginalized as an area of faculty research in many institutions. Also, some faculty are reluctant to grant access to their classes for the purpose of in-class observations. Others are concerned about strangers taking notes as they teach. This is especially the case during times when teaching evaluations are

being conducted. Faculty may also resist requests for interview because of time constraints. If a study is to succeed, faculty reluctance must be overcome.

Decision Point: Ensuring Faculty Buy-in

When I began the study, co-op coordinators acted as liaison for me with faculty, negotiating access for in-class observations and the survey. After each observation, I introduced myself to the instructor and requested an informal interview. This coordinator-led approach was reasonably successful for the first three classes I observed. When I arrived to observe the fourth class, however, the instructor did not wish me to observe his class, nor would he agree to an interview. This caught me by surprise, and put the future of the study in jeopardy.

I convened a meeting of the co-op coordinators and two supportive faculty members to find a way around this dilemma. We decided to combine in-class observation and the student survey into one visit, rather than two. This proved both efficient and effective during the remainder of the study. We also decided that, in each program, the co-op coordinators would introduce me to faculty ahead of time, allowing me to describe the study and have faculty buy into it. That way, when I subsequently arrived at a selected class, the instructor knew who I was and why I was there. I was able to conduct my observations and the instructor would turn the class over to me for the last 20 minutes, to allow me to administer the survey.

An unintended benefit of this arrangement was that I could engage instructors in conversation while the students completed the survey questionnaires. These initial classroom conversations inevitably led to offers to continue after the class was dismissed, or at a later scheduled time. This strategy alleviated the earlier problem of getting faculty to commit time for interviews and relying on co-op coordinators to approach faculty on my behalf. I could now schedule faculty interviews directly, and faculty were more relaxed and forthcoming in responding to questions. These interviews engaged faculty interest in my study, and a number followed up with me later, to find out how the study was progressing, and offer further assistance.

In the next section I present a selection of the findings of my study. I begin with a brief presentation of the quantitative results to provide an overview of the students enrolled in co-op programs. I then selectively use students' quotes to present qualitative results on learning and context.

SURVEY RESULTS

Of the 1,012 students surveyed, 73% (n = 737) were co-op students. Unless otherwise stated, the following results relate only to the co-op students in the

sample. Of these, 64% were male and 36% female. Only one program—Engineering—shows a marked gender disparity, with considerably more males than females in the sample. One-fourth of the students (26%) are between 18 and 20 years of age; a further 36% are 21 to 22, and 24% are 23 to 24 years of age. A smaller number of students (14%) are 25 years or older. There was neither a marked difference between the ages of male and female students, nor in the distribution of ages across programs.

An approximation of co-op students' socioeconomic status can be inferred from parents' combined occupations. More than two thirds (69%) of respondents classified fathers' occupations into four broad categories: professional (38%), senior management (14%), craft and trades workers (9%), and technician (8%). The top four occupational classifications for mothers—accounting for 70% of the total—included: professional (34%), service and sales (14%), clerical (14%), and never employed (8%).

On average, more than one half of co-op students in the study had some form of paid work experience prior to entering university. Two thirds of Geography (66%) and Engineering students (65%), and one half of Business students (56%) worked between high school and university. Less than one half of Chemistry students (43%) had work experience when they enrolled in university. Few co-op students, however, had worked in areas related to their current field of study between high school and university. The prime motivators for undertaking employment were to make money for tuition and to gain work experience.

Students pursued co-op for a variety of individual reasons. Each initially approached higher education with a learning orientation, structured around academic, personal, vocational, or social reasons that ultimately motivated them to seek this type of education. These reasons were not made explicit in the survey data but become apparent through student interviews. Because this chapter focuses on the effects of context on learning, and thus process and meaning, the majority of findings reported in the remainder of the chapter are drawn from the qualitative results of the study.

Student Interviews: Learning and Context

Because co-op students alternate between the work term and the classroom, they draw on their experiences in both contexts to develop their perceptions of learning and work. The boundaries between the two contexts are permeable; we can not assign learning to one camp and work to another. However, certain activities can be more clearly presented if we maintain an analytic distinction, at least initially. For example, the workplace is where co-op students have an opportunity to develop skills and experience in the practical application of theories they may have only learned about in the classroom, while learning how to be a professional in their field. Meanwhile, the university combines academic preparation with work experience and professional training in an attempt to ensure the relevance of

classroom education to real-world employment. In presenting the findings, I frame co-op students' experience in the academic context as learning *for* the workplace, and their experience on the co-op work-term as learning *in* the workplace.

Co-op students distinguish between learning from books and learning through hands-on application. What I call the *co-op effect* is the perception that learning takes place as a result of the activities of practical application in the workplace, rather than through the activities of the classroom. What goes on in the classroom, students suggest, is not learning but study, or the learning about a discipline. For co-op students, classroom learning does not take on meaning until there is an opportunity for practical application. This leads to student concerns about the potential for transferring classroom learning from one context to another, more practical one. Although they learn disciplinary skills in the academic context, these skills are usually transitional to workplace applications, not reflective of them. In other words, students consider disciplinary skills learned in the academic context as skills developed *for* the workplace and skills learned *in* the workplace as grounded in practice and, therefore, a way to strengthen understanding of the range of potential applications.

Learning in the Workplace Context. To understand how co-op students develop skills and expertise in the workplace, we must first acknowledge that workplace cultures embed particular values. There is increasing evidence that learning, and motivation for learning, are mediated by activities embedded in a context that makes sense and matters to the learner (Billet, 1999; Engeström, 1994; Grosjean, 1996; Grosjean, 2003). Co-op students describe entering the workplace with little or no specific knowledge and gradually becoming more expert as they become familiar with, and actively use, the work setting. The specific social, symbolic, technical, and material resources available in the workplace enable co-op students to complete assigned tasks with increasing success (Grosjean, 2000; Scribner, 1984). Therefore, the environment is not just the context in which a problem is embedded but is an active component of problem solving.

Whereas approximately one fourth of students interviewed spoke of the importance of being able to practice in the workplace what they previously learned in class, more than one half spoke of the impact that learning in the workplace had on their academic performance. A third-year female engineering student described learning skills in one work term that "actually helped [her] in a subsequent work term." Her academic courses did not help her on the job, but "skills learned on the job helped her once she returned to the classroom" [CSP13].[2] This emphasis puts learning flows in reverse, with workplace learning providing students with a better understanding of their academic coursework.

[2] Alpha-numeric codes are used in this chapter to identify study participants. This ensures that participants' identity is not revealed.

> You learn a lot more on the job because you can see how it ties in so many different ways to what you are learning. And that is better. In class we might learn a particular concept A, whereas in the work place we learned B, C, and D. But they tie into A! But we never knew that they tied in until we did it. So yeah, I think you learn more in the workplace. And, you come back with skills that you wouldn't have learned otherwise. [CSP31]
>
> I think it's really good that you get paid to go and learn, and to go and do all this stuff, and really, you are still a student. And you don't really know what you're doing yet, but I found that things I learned on my work term were really helpful when I came back to university and started taking more courses. [CSP12]

A majority of students contend that learning skills in the milieu of workplace practice leads to a deeper understanding than can be obtained in the classroom.

> When you do it from an application standpoint, you're curious as to "Hey, what happened here?" Because you don't know what's happening, you have to basically think about what was going on, and you learn a lot more in the workplace when you're doing the problem solving, than when someone in the classroom just tells you what's going to happen. [CSP26]
>
> Going through almost any academic program without having to apply the knowledge, you don't really know what it pertains to. It doesn't matter what you learn, unless you use it. It has no bearing on your own personal life if you don't have to use that knowledge. [CSP31]

Co-op students assign higher importance to learning in the workplace than in the classroom. During the interviews, when asked "what does learning mean to you?," most students immediately began discussing what they had learned in the workplace, rather than the classroom. When pressed about learning through coursework, they largely restricted their responses to brief discussions about whether instructors were good or bad. Effort was required to get them to talk about their classroom learning. In contrast, they were enthusiastic about discussing workplace learning and about how the experience would help them in their future professions.

When co-op students arrive at a workplace to begin a work term, they enter a community of practice. Membership in a community of practice requires co-op students to undergo a process of enculturation into the professional environment. Learning and skill development take place during this process. It is through interactions in the workplace and participation in the activities that make up a profession that students begin to adopt the characteristics of its members, and start to develop a professional persona.

> It comes down to the way you carry yourself more than anything. And that is something that I learned on the work terms. [CSP44]
>
> It was incredible learning on my last work term, just working with them as a co-op student. We took part in everything. We were shown how to do stuff and learned

> on our own. We took part in all the group meetings, and it made us feel like real engineers. [CSP13]

In the workplace students are encouraged to think like a professional and to see their role as one of becoming a junior professional rather than a co-op student. Becoming a professional requires the development of effective interpersonal skills.

> In a professional type job, you interact with a lot of people and a lot of different personalities, and you have to learn how to deal with those personalities and how to get around that. It is something that you don't really get much of in school. [CSP15]
>
> Just being aware of what I should be learning and being aware of what things I want to take away from the whole process. I'm more conscious of what I'm doing when I'm in a workplace, because each one is different. A lot of different things, like being able to get along with other people, meeting deadlines, learning from other people, or just being in a place where you can learn from using the equipment, all of those things are inherent to the professional workplace. [CSP31]

In the workplace, as students are learning disciplinary skills, they are also learning to be members of a situated community (Lave & Wenger, 1991), while being disciplined as members of a profession (Foucault, 1977). In this way, co-op students learn not only content knowledge but also disciplinary norms, expectations, and standards in a particular area.

The learning that happens in the workplace seems to possess a durable, lasting quality. The activity involved in practical application in the workplace affects how students remember, and subsequently recall the procedure when required.

> When I learn something in the workplace I remember it. Once I have a chance to use it, it just makes sense. I could go back to the same job that I did four years ago and still remember how to do all the basics. I may be a bit rusty, but I will remember it, whereas if I was to go back and try to recite a formula I learned in first year, no way! [CSP31]
>
> There are a lot of times where we will look at a concept in one of my classes and I think I understand it at the time, but I can't remember it later. Whereas on my work term, if we work on that concept, and I can see how it applies, it sticks. I will remember that forever. [CSP45]

Students' descriptions of their activities in the workplace indicate that learning in the richly contextualized environment of the workplace is different for co-op students than the learning that happens in the academic context of the classroom. Students consider the environment of the workplace as more than just an alternative context for learning. To them it is a more dynamic and robust site of learning. On the other hand they see the learning in the classroom as disembedded from the context of professional practice.

Learning in the Academic Confext. Classrooms are sites where students learn standards of disciplinary practice while being disciplined into the role of university student (Biggs, 1987; Entwistle, 1996). That is not to say that disciplinary skills are not learned in the academic context. But despite attempts to simulate the professional context in the classroom, disciplinary practices and discourse learned there will not be those of the workplace. As student comments make evident, learning workplace procedures in the classroom does not seem real ("It's still just in a book. It's not really real," and "I just keep thinking it is school, it isn't real") and, therefore, the procedures aren't taken seriously. The academic context within which the students are taught certain disciplinary procedures is perceived to be distinctly different from the professional context to which co-op students aspire. Social roles and communicative practices are also perceived as distinctly different in academic and workplace settings.

Whether in the workplace or the classroom, learning and skill development are mediated by learning strategies. In the classroom, time and competitive pressures leads some students to adopt a learning strategy that addresses the immediate needs of reproducing facts on a test (surface-level learning) rather than fostering understanding (deep-level learning). Students perceive that the academic assessment and reward system in the classroom favor those with well-developed memorization skills, rather than well-developed understanding. It is easy for students to shift from a deep to a surface-level learning strategy to accommodate perceived assessment objectives, but this shift is often difficult in reverse (Engeström, 1994). Evidence indicates that some co-op students develop a compromise strategy or strategic *approach* by finding a middle ground (Grosjean, 1999a, 2001). In other words, in some courses students adopt a surface-level strategy because assessment is based on accurately reproduced facts, and in others students use a deep approach where assessment encourages the demonstration of understanding.

Ramsden and Entwistle (1981) indicated how perceptions of the methods of assessment used to evaluate progress in academic courses can influence students' attitudes and approaches to learning. When I asked students what was the primary objective of their coursework they invariably answered that the objective was to get good grades. Therefore, what appears important to students in the academic context is not necessarily the development of an in-depth understanding of the foundations of a discipline. Rather it is the accumulation of a sufficiently high GPA that can be parlayed into future co-op opportunities. Faculty members confirm that students with high GPAs find the co-op program somewhat easier, suggesting that what finally matters to both instructors and students is less the academic work undertaken in the classroom, than the grade assigned to the work.

Differences in the academic and workplace contexts can not easily be resolved. With a mandate to assist the professionalization of students by allowing them to benefit from the synergy of dual learning contexts, co-op education carries built-in conflicts between the workplace and the classroom. For example, in the

classroom, co-op students demonstrate their learning of theoretical principles by appropriate reproduction on assignments such as tests; in the workplace, knowledge is demonstrated through proficient practice. Co-op, however, uses two sets of criteria for assessing student achievement and progress. One set is designed to assess understanding through reproduction of the principles of practice (academic grades); the other assesses understanding through demonstrated proficiency in practice (employer's evaluation). Although both methods of assessment are employed in co-op, only one carries academic credit.

Students in co-op programs at Coast University receive no academic credit for completion of work terms but must successfully complete a prescribed number of discipline-specific work terms in order to graduate with the co-op designation. Successful completion of work terms is judged by the quality of the student's work-term report and an employer evaluation. Academic credit, however, is reserved for those activities that take place in the classroom and can be assessed using traditional academic criteria. Although attempts are made to extend the academic context into the workplace through the development of learning objectives for work terms, the academy still rewards cognitive understanding over the development of procedural knowledge and practical skills. It seems at odds with itself and with the mainstream educational curriculum by using differing evaluation criteria.

Summary

- The context in which a learning activity takes place is crucial to the way co-op students develop knowledge and skills.
- The structured rotation between classroom and workplace enables co-op students to engage in continuous, contextualized learning.
- Obtaining support and endorsement (buy-in) for the study from individuals at all levels of the institution is a core requirement for a successful study.
- Co-op work terms produce a *co-op effect* that shapes students' perceptions of learning and work and profoundly impacts their experience of the co-op program.
- The power of the academic context, particularly through setting and assessment of academic progress, influences co-op students attitudes and approaches to learning.

ANNOTATED BIBLIOGRAPHY

Engeström, Y. (1994). *Training for change: New approach to instruction and learning in working life.* Geneva: International Labor Office. This highly readable book (which easily doubles as a training manual) provides insights into contextualized learning. It helped shape my thinking about the ways in which learning, and motivation for learning, are mediated by activities embedded in a context that makes sense to the learner. It also

helped me understand how the structured alternation between classroom and workplace in co-op results in continuous contextualized learning.

Marton, F., Hounsell, D., & Entwistle, N., (1997). *The experience of learning.* Edinburgh: Scottish Academic Press. This is a book I refer to often. Unlike some other edited collections, this book has a strong focus—research on student learning in higher education. The 15 chapters report on a series of related studies of the way students learn in higher education. Each is written around a research focus developed by Ference Marton called *phenomenography*. Findings are drawn from the systematic presentation of extracts from interview transcripts and presented in such a way that the learners appear to be speaking directly to the reader about their experiences.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity.* Cambridge: Cambridge University Press. Following an earlier collaboration with Jean Lave on *Situated Learning* (1991), Étienne Wenger has gone on to develop a social theory of learning in communities of practice. Learning is the engine of practice, he says, and practice is the history of that learning. The process of engaging in practice involves both acting and knowing. In other words, manual activity is not carried out in the absence of mental activity. This book was a valuable resource in shaping my thinking about the importance of the situations in which learning takes place.

Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context.* New York: Oxford University Press. A comprehensive work on the situated nature of learning that I found useful. Although based on research of cognition in children, the concepts translate well to adult learning, particularly in relation to the development of knowledge as a product of the activity and situations in which it is produced. Barbara Rogoff pointed out the role of peer interaction in enhancing, motivating, and channeling the choice of activities in learning situations. The social roots of cognition are stressed, and the interaction between mind and behavior becomes key. Viewed in this way, the basic unit of analysis shifts from the individual to the active participation of people in socially constituted practices.

Sharma, L.A., Mannell, R.C., & Rowe, P.M. (1995). The relation between education-related work experiences and career expectations. *Journal of Cooperative Education,* XXX (3), 39–47. This work assisted my thinking about the importance and location of intrinsic and extrinsic rewards in the formation of career expectations and job outcomes of co-op participants. It points out the relevancy of the work experience component of co-op and how expectations for support and encouragement from the work organization impact students' career decisions.

Biggs, J.B. (1987). *Student approaches to learning and studying.* Melbourne: Australian Council for Educational Research. This work is part of a growing body of evidence that attests to the effect of context on learning in the university classroom. Biggs shows how a rigid system of rules and norms enforces power differentials in the classroom, leaving students with little opportunity to influence the development of, or make changes to, the curriculum. Denied options, many students simply strive for the academic grades that constitute the currency of the university.

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