

5 Theories of Learning in Cooperative and Work-Integrated Education

CHRIS EAMES

University of Waikato, Hamilton, New Zealand

CHERYL CATES

University of Cincinnati, Cincinnati, OH, USA

The principal goal of any educational program is to facilitate student learning. In cooperative education (co-op) programs, this learning facilitation occurs in two distinct settings, the educational institution and the workplace. A key tenet of cooperative education is that the student will integrate learning between these two settings. To facilitate this integration, educators in co-op programs must adopt appropriate curricula and pedagogy for student learning, underpinned by theory.

In the previous chapter, Van Gyn and Grove-White discuss theoretical perspectives on learning framed by three general orientations: *transmission*, *transaction* and *transformation*. In the present chapter, we focus primarily on learning theories within the transaction orientation of cognition and pragmatism. The emphasis of this orientation on intellectual and rational activities associated with problem-solving, and the development of cognitive skills to support further knowledge acquisition, combined with the focus on learning rather than teaching, and on learner-centered outcomes makes the transaction perspective a logical orientation for cooperative education practitioners. This fits with the prevailing Western view of learning in which many co-op programs have been situated. We conclude our look at theories by examining sociocultural views of learning, which moves the discussion towards the transformational learning discussed in the previous chapter, an orientation that also fits well with cooperative education, particularly in the emerging/developing countries.

Within this framework, we briefly introduce a number of learning theories that are helpful in thinking about learning in co-op programs. These theories allow explication of what a student should learn through a curriculum in the classroom and in the workplace. This theoretical base would also permit adoption of pedagogical (teaching & learning) strategies such as classroom instruction, preparation for, completion of, and assessment of, the work placement, and integration of the learning between the pedagogical settings. Finally, an understanding of a sound theoretical basis to cooperative education can assist in justifying the inclusion of work placement components in an educational program and underpin research into educational outcomes of co-op programs. These issues are further explored below, and in the following chapter.

ISSUES IN LEARNING IN CO-OP PROGRAMS

The development of cooperative education has been characterized by research which Bartkus and Stull (1997) have described "as applied-descriptive and evaluative in scope. It has been largely pragmatic in nature without a strong theoretical underpinning" (p. 9). This research is typified by the work of Auburn (1972), Dubick, Mc Nerney, and Potts (1996), Eames, Kumar, Rowe, and Hitchcock (1996), Fenster and Parks (2008), Gomez, Lush, and Clements (2004), Henry (1978-1979), Somers (1995), and Wessels and Pumphrey (1995). Their findings have helped to define what constitutes the *operation* of a successful co-op program and have contributed much useful quantitative data to the field. In particular, these studies have pointed to outcomes of the work placement such as application of theory in the workplace and career clarification for students; completion of small projects and recruitment of suitable graduates for employers; collaboration with employers, and attraction of students to their programs for educational institutions. However, the cooperative education community has noted the greater difficulty in ascertaining the educational outcomes from, and processes in, work placements (Ryan, Toohey, & Hughes, 1996; Van Gyn, Cutt, Loken, & Ricks, 1997). This difficulty has led to a relative paucity of understanding about learning in the work placement. This section examines the issues surrounding understanding learning in co-op programs, which are addressed as legitimization, and theoretical concerns.

Legitimization

Concern for understanding how learning occurs on co-op placements, which could help legitimize placements as educative, has been prominent in the co-op literature for many years. In Wilson's view, "we rely too much on student papers about their work experiences and on employer ratings in order to award credit and we spend too little effort finding out what the students are really learning so that we can effectively guide them in their further learning efforts" (1989, p. 42). A key to these concerns is the fact that many institutions award degree credit for work experience conducted as part of a co-op program (Wilson, 1973). Wilson (1989) argued that it is important that credit is not simply given for work experience, but that it is given "for learning resulting from work experience" (p. 36). Therefore, it is important to co-op educators that learning through work experience is understood so that appropriate curricula, pedagogy, and assessment can be designed and implemented.

It was this concern for assessment and legitimization of learning on work placements that led the U.S. Government in the late 1970s to commission a study into educational outcomes and their assessment in co-op programs (Wilson, 1980-1981). This study surveyed large numbers of students, employers and coordinators, and identified 72 learning objectives that could or should be incorporated into co-op programs. Other studies suggested methods for setting objectives and measuring outcomes (Garmon & Strandberg, 1976; Laramee, 1972), and focused on student perceptions of what they learnt on placement (Trigwell & Reid, 1998). These studies fuelled a debate about whether work placements can be viewed as a learning component, and whether they should be incorporated into an academic qualification, particularly at tertiary level. This debate led co-op practitioners to believe that they must legitimize co-op programs as learning programs through a pedagogically sound work placement process. In their assessment of the Canadian co-op system, Cutt and Loken (1995) concluded that evidence to that date to support that legitimization of pedagogical soundness was thin. As Van Gyn et al. (1997) pointed out, the traditional view had been that cooperative education is an effective training strategy rather than an educational strategy. This view implies that co-op is a vehicle for training students to perform certain tasks in certain jobs, rather than the more generalist knowledge/skill accumulation and development of thinking assumed to be the domain of classroom education, particularly in the higher education sector.

We would argue that such a distinction between learning on placement and learning in the classroom is unhelpful and irrelevant to understanding learning in co-op programs. What is more germane is to consider the learning that does occur through co-op placements and how it complements the classroom learning. Enhancing understanding of this placement learning and its integration with classroom learning through research-derived evidence could remove administrative and political objections to the value of co-op placements, and help provide greater legitimacy to co-op programs.

Theoretical Concerns

The failure to gain clear recognition of work experience components as learning opportunities, and to understand the integrative nature of the learning process, has been linked to a failure thus far to place cooperative education on a sound educational basis with a theoretical underpinning. There have been increasing calls, for example, by Ricks et al. (1990) and Stull, Crow, and Braunstein (1997), that for cooperative education to be credible as an educational practice, it should be related to a theoretical framework of education and educational goals, grounded in learning theory. In 1985, the Cooperative Education Association of America (CEA, now CEIA, incorporating internships) commissioned a committee to report on the location of cooperative education within the mainstream of American higher education. They were concerned that despite the obvious growth and success of co-op, the discipline languished on the periphery of academic endeavor (Heinemann, 1988). The committee's report reflected this view and suggested three main reasons for this:

1. Faculty do not recognize work as a vehicle for learning and, in fact, view cooperative education as *anti-intellectual* [original emphasis];
2. Co-op practitioners tend to see themselves as operational people concerned with logistics and administration – not as educators; and

3. Cooperative education methodology for promoting learning is vague and underdeveloped (as summarized by Van der Worm, 1988, p. 121).

On the strength of the committee's report, the CEA committee recommended that more research be conducted into learning outcomes that takes heed of cognitive psychology, skill acquisition and enlists the aid of researchers from a variety of disciplines such as psychology, sociology and education, so as to be exposed to a variety of theoretical views (Heinemann, 1988). This recommendation found favor with Branton et al. (1990) who further argued that more research of itself would not help: the research needed to be "placed in the context of contemporary learning theories" (p. 31). An alternative to this strategy would be to generate theory from research into co-op practice as suggested by Ricks et al. (1990).

Cates and Jones (1999) argued for three important benefits that result from planning for learning in co-op placements: student learning is optimized through conceiving the work placement as a learning experience that is pedagogically planned; clear learning goals linked to a curriculum can be defined and assessed in placements; and the co-op program can enhance the educational standing of the institution. The developing recognition (Coll et al., 2009; Dimenas, 2010; Griffin, Mitchell, & Lorenz, 2010) of the importance of understanding and fostering integrative learning pathways in co-op programs strengthens this argument. This is seen to be particularly important in development of explicit pedagogical approaches (Coll et al., 2009) and assessment of learning outcomes in the workplace (Allen & Peach, 2011). Some theories of learning that could assist in achieving these developments are now discussed.

LEARNING THEORIES FOR COOPERATIVE EDUCATION

Theories abound on how students learn. In this section, we briefly examine several of these theories for their use in helping us to identify the factors in cooperative education practice that support learning from a theoretical perspective.

Piaget's Cognitive-Development Theory

As co-op students are developing reasoning strategies related to the classroom, they are also developing reasoning strategies related to industry while they are completing their co-op work assignments in the workplace. Jean Piaget proposed that logical thinking occurs when the learner simultaneously coordinates an operation and its inverse and predicts the changes that will be likely to occur (Piaget, 1985). According to Piaget, there are three fundamental processes in the development of logical thinking: assimilation, accommodation and equilibrium.

- *Assimilation.* The integration of external elements into the learner's internal structures;
- *Accommodation.* Adjustments in the learner's internal structures and qualitative transformations in thinking; and
- *Equilibrium.* The set of processes that maintains cognitive organization during the learner's changes in thinking.

For the co-op student, the processes of assimilation, accommodation and equilibrium are naturally at work, as they encounter new knowledge, skills and experiences in the new context of the workplace. But as we examine the concept of cooperative education for its effect on student learning, perhaps it is the area of equilibrium that is most significantly affected. Co-op practitioners have long advocated this educational methodology as the best way to ease students into the world of work. What actually occurs for the co-op student is a less drastic taxing of their equilibrium. The simultaneous development of reasoning strategies for both education and work enables students to maintain the organization of their cognitive structure more easily. It also explains why co-op students make the transition to work immediately upon graduation whereas the non-co-op student undergoes an adjustment period (Gardner & Koslowski, 1993). The non-co-op student develops the logic of the classroom but upon graduation, must radically shift to the logic of work. This adjustment to the student's internal structure and subsequent change in thinking creates a state of disequilibrium that may explain the transition problems employers often describe in non-co-op students. Co-op students may experience less disequilibrium compared with non-co-op students during that transition.

Atkinson's Model of Achievement Motivation

One of the claims about cooperative education is that it increases student motivation (Dawson, 1980-81; Fletcher, 1989). But what could it be that motivates students to learn? One model to describe student motivation is the expectancy-value model derived from Atkinson's model of achievement motivation (Atkinson, 1964). In this model, expectancy, in combination with task value, leads to task involvement and subsequent achievement. Atkinson defines expectancy as the student's belief regarding his/her probability of success (or failure) on a particular task and value as the value the individual attaches to the success or failure of the task.

Cooperative education has the potential to influence both sides of the expectancy-value model of student motivation. The co-op process is typically a series of successes or failures that build upon one another. From the first résumé to the final job offer upon graduation, most students build upon previous successes, or learn from previous failures. As students meet with success they come to believe in the probability of future successes. As students suffer defeats, they learn appropriate ways of working within that workplace. With co-op professionals to guide the students in securing the work assignment, and supervisors or mentors to guide them while at the work assignment, students come to realize that the task difficulty is not something beyond their capabilities. Turning to the value side of the model, the value students place on the task is influenced by the student's perception of the task's ability to provide a challenge, the student's belief in the enjoyment they will derive from the task, and the importance of the task in facilitating the student's goals, and the institution's or employer's goals set for the task. When cooperative education students are working in an assignment that matches what the student wishes to do, the work is likely to provide them with enjoyable challenges and facilitate the achievement of their goals. This theory also highlights the different value that students may place on tasks that are designed for institutional learning (such as assignments to pass a course) compared to tasks in the workplace (that are crucial to the ongoing success of the business). Consideration of this theoretical perspective on student learning has implications for designing a pedagogy that takes into account the expectancy-value model.

Bandura's Social Learning Theory

In his theory of social learning, Albert Bandura began by exploring imitative learning which maintains that the learner imitates a modeled behavior and, as that behavior is reinforced, repeats the behavior (Bandura, 1977). In Bandura's social learning theory, consequences of behavior are essential to learning. But, unlike some other learning theories, the consequences of behavior are not limited to that of the learner. Students can learn through vicarious consequences, either reinforcement or punishment. Vicarious reinforcement conveys information about which behaviors are appropriate in which settings and allows the observer to experience emotional responses to the model's reward. In the case of vicarious punishment, the observer views behaviors that are likely to be punished and are therefore inappropriate. Cooperative education students experience social learning as they observe the behaviors and consequences of those behaviors in their colleagues in the workplace. While co-op students will learn from their own successes and failures, they also learn from the successes or failures of others. In preparing students for the work placement, pedagogy from this perspective would need to include orientation of students to the importance of observation of workplace behavior and reflection on its meaning and consequence.

Experiential Learning and Reflection

Perhaps one of the most familiar learning theories to co-op practitioners is Kolb's experiential learning model (Figure 1) (Kolb, 1984). It describes the learning process as a four-stage cycle, which co-op students move through on a continuing basis:

1. Concrete experience followed by;
2. Observation and reflection which lead to;
3. The formation of abstract concepts and generalizations which lead to; and
4. Hypotheses to be tested in future action, which in turn lead to concrete experience.

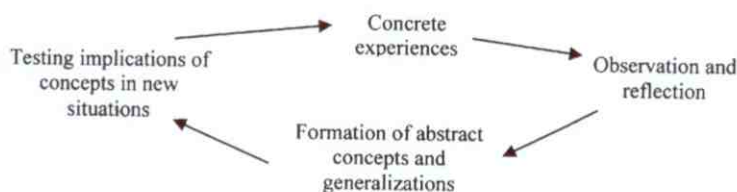


FIGURE 1
Kolb's experiential learning model

Within this model of the learning process, the learning cycle is constantly recurring. This model describes the co-op learning cycle quite eloquently. Students will have concrete experiences through their academic coursework and their cooperative education assignment. Both on the job and when they return to the classroom they will be given the opportunity to observe and reflect upon those experiences. Students will be asked to complete an assignment that is designed to heighten their observation while on the job and to reflect upon these experiences. Reflection on practice and in practice has been argued (Boud, Keogh, & Walker, 1985; Schön, 1983) to contribute to learning from experience. Researchers (Doel, 2009; Howard, 2009; Van Gyn, 1996) have demonstrated that this process can enhance co-op student development and make assessment for learning more productive.

Both the experience itself and the reflection in any postplacement assignment will give students the opportunity to form abstract concepts and generalizations that they will then test in subsequent experiences. Students can begin anywhere in the cycle. Students completing an academic term can formulate concepts to test in the workplace during the next phase of the cycle. Students completing a co-op work term can formulate concepts for action and reflection during the next academic term as well as the next co-op work assignment. This model is particularly useful in explaining how learning can be integrated between the classroom and the workplace. By this argument, learning would be reinforced through more than one co-op placement in a program, and the pedagogy in the co-op program would be designed to enhance student engagement in each of the stages of the cycle. Similarly, assessment tools would be designed to fit this learning process.

Reflection-in-Action

Reflection-in-action as a theoretical framework to understand cooperative education has been advocated by Schön (1983) and adopted as viable by many others in the profession. Schön argues that for reflective practice to take place, students must apply past knowledge to a new situation. This can happen as individuals reflect upon an incident while it is occurring or with the assistance of reflective dialogue by a mentor or coach after the conclusion of the incident itself. Mezirow (1998) describes reflection as "simple awareness of a perception, thought, feeling, disposition, intention, action" and includes in his definition "letting one's thoughts wander over something, taking something into consideration, or imagining alternatives" (p. 195). This activity allows us to step back and recapture experiences, evaluate them and consciously learn from them (Bailey, Hughes, & Moore, 2004; Boud et al., 1985). Most recently, Raelin has been a prolific voice for the importance of reflection in the learning process. He argues that when dialogue takes place in a trusting environment, the emotional data from the experience can surface and enhance contextualized learning (Raelin, 1997). From the perspective of contextualized learning, the idea of reflection-in-action permits its consideration within the praxis branch of learning in which one thinks about what is being learnt (Raelin, 2006). Raelin further argues that reflection-in-action often requires some level of facilitation to assist learners in framing their knowledge into critical inquiry (Raelin et al., 2008).

Action and Active Learning

Active learning has been explored as a theoretical model for work-integrated learning. It involves taking initiative for learning as well as reflection upon that action without the elimination of more traditional classroom activities such as course materials, student constructed activities, case studies or group projects (Meyers & Jones, 1993). Action learning has more often been associated with action research, but it differs in that action learning is an outgrowth of the learner him/herself and is strongly embedded in the learner's own frame of reference, as part of a process of purposeful and reflective learning regarding a problem for the learner (Knowles, 1975). Revans (1980, 1982, 1998) is often credited as the first to develop action learning as a theoretical model in which action and reflection are combined. While action research integrates theoretical knowledge within a practical setting, action learning does not require that new knowledge be extended into a theoretical context (Coghlan & Brannick, 2001).

Centralized Role of the Learner

One of the more unique features of work-integrated learning in all forms is the central role of the learner in the process. Students are required to find meaning across the educational and work environment. The individual's learning is, therefore, an idiosyncratic construction of knowledge (Billett, 2006). Work-integrated learning offers the individual the opportunity to learn, but it is up to the individual to take advantage of the invitation presented. While this learning takes place within a social setting, it is the role that the individual plays in their own learning that makes all forms of work-integrated learning unique (Billett, 2007). This concept is far from new. In *Democracy and Education*, Dewey (1916) states that the learner, "unconsciously, from the motivation of his occupation, reaches out for the relevant information, and holds onto it" (p. 310). Mahoney (1996) argues for the central role of the learner stating that the learner "cocreates the personal realities to which she responds and thereby participates in a reciprocity, not only between her environment and her body, but also within different levels of her own activity" (p. 129). Guile and Griffiths (2001) developed a typology of work experience about the centralized role of the learner; within the framework of the experiential model, the learner becomes self aware by adapting to the environment and reflecting upon personal and professional development.

Sociocultural Views of Learning

A set of ideas known as sociocultural views of learning proposes that learning can be seen as a social process within a culturally determined community of practice. There are a number of ideas within this set that emphasize different views of the social and cultural dimension for learning that can be useful for theorizing about learning in cooperative education (Eames & Coll, 2006).

One idea depicts learning as a situated activity within a community of practice (Lave, 1991; Lave & Wenger, 1991; Wenger, 1998). Lave (1991) described situated learning as emphasizing "that learning, thinking, and knowing are relations among people engaged in activity *in, with, and arising from the socially and culturally structured world* [original emphasis]" (p. 67). That is, learning occurs within a social situation, cannot be dissociated from it, and can only be understood within the context in which it occurred. In this view, cooperative education students become legitimate participants in a community of practice during their placements, and engage in the authentic activities (Billett, 1994) of that community, such that they develop meaning for their practice, and through their participation (Rogoff, 1995) become enculturated into the community (Brown, Collins, & Duguid, 1989; Hennessy, 1993). Researchers have begun to see how this process of socialization and situated learning can lead to development of professional practice and identity in diverse disciplines such as police work, science and community work (Campbell, 2009; Eames & Bell, 2005; Harris, Jones, & Coutts, 2010).

A second sociocultural view of learning is that cognition (e.g., learning) is distributed across a community of practice. The notion of distributed cognition suggests that learning is seen to not just involve the person, but the person-plus (Perkins, 1997), being the person plus the surround. In this way, cognition is seen to be located outside individuals' heads, and jointly composed in a system of people and artifacts (Cole & Engestrom, 1997; Salomon, 1997a, 1997b). A co-op placement student can be seen to gain access to that distributed cognition through entering into that system and coming to participate within it.

A third sociocultural view of learning is that human action is mediated by tools and signs (Bell & Cowie, 2001; Vygotsky, 1978; Wertsch, 1991). This view draws on the work of Vygotsky (1978), and mediated action considers that human action such as learning is effected by tools and signs, which are themselves situated in the social and cultural environment in which they exist (Wertsch, 1991). Wertsch, del Rio and Alvarez (1995) separated the mediational means into technical tools (such as instruments, & computers) and psychological tools (such as language & counting systems). Two key ideas arise from consideration of the influence of mediational means. First, they are used in social interaction, particularly in the case of language. Second, they are “products of sociocultural evolution, and are inherently situated in sociocultural context” (Wertsch, 1991, p. 91). As specialized language is used in the workplace, this approach would appear to hold promise in understanding how students learn in their co-op work placements. As well as this, all students in co-op placements are likely to be required to use some form of instrument or other tool that could affect their learning. The notion that learning occurs through mediated action in social situations, therefore, has relevance to co-op placements.

Sociocultural views of learning suggest a view of students on placement as legitimate peripheral participants (Lave & Wenger, 1991) who learn through their participation in the activities, social interactions, tools and signs of their workplace community of practice. Co-op program curricula would necessitate the opportunity for students to move towards increasing participation in their community, and pedagogy would be designed to assist students to recognize and enhance their movement towards becoming more central participants, and assessment would examine the student’s success in achieving that.

An idea that is related to these sociocultural views and that is currently gaining popularity in educational research, is activity theory, also known as cultural-historical activity theory (CHAT) (Bakurst, 2009). Activity theory is based on work by Russian philosophers such as Vygotsky and Leontiev, and was brought to Western attention by Engeström (Engeström, 1999). CHAT focuses attention on the activity being undertaken and helps identify the object (what is being worked on) of the activity, the mediational tools being used to achieve the object, and also considers the cultural-historical context for the activity through recognition of the rules and the division of labor and the community within which the activity is situated (Figure 2).

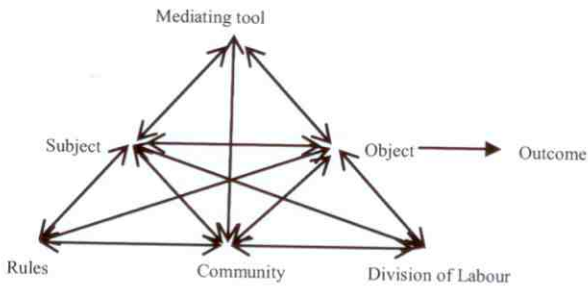


FIGURE 2
Model of activity theory (adapted from Engeström, 1999)

This theoretical approach would seem to allow clear attention to be drawn to the matter for practice in both the workplace and the educational institution, and a consideration of their contexts in examining how these influence both the process and outcomes of student learning. To date, there are no known examples of research studies in cooperative education that have used activity theory as a theoretical base and it is to be hoped that in the near future this could be addressed.

The Place for a Critical Approach?

These sociocultural views open the door for a consideration of the role which cooperative education plays in inducting the student into the world. Often portrayed as preparing students for the world of work, with an assumption that the student will then fit neatly into and perpetuate that

world, questions arise as to whether that should be the only role of education. For example, Simon, Dipbo, and Schenke (1991) ask should students not be encouraged to look critically at the beliefs, assumptions and power structures that pervade their placement organization? Should they not be enabled to participate in critical dialogue (Giroux, 2003) that may lead to constructive change, in the manner of the transformative orientation discussed in the previous chapter of this Handbook? However, such questions bring with them risks of disenfranchising co-op stakeholders (Johnston, 2007) by making employers wary of taking on critical students, and by placing students in the potentially difficult place of critiquing organizations from a position of little experience of the workforce. Johnston (2007) concludes that the potential gain from adopting critical pedagogy in cooperative education in a well-thought through process should not be ignored if we are to genuinely serve the best interests of our students.

Through consideration of the theoretical underpinnings of cooperative education that provide a better understanding of how students learn and the purpose of cooperative education itself, we can design curricula and employ pedagogical practices to facilitate student learning in co-op programs. As co-op professionals, we must endeavor not only to facilitate students' learning through cooperative education, but also to focus on the quality of that learning. To strengthen our understanding, research is needed into the applicability of these learning ideas to cooperative education. The next section briefly outlines some research that has attempted to do so.

RESEARCH INTO LEARNING IN COOPERATIVE EDUCATION

Despite a recent increase in research activity focusing on cooperative education programs, there is still much to be understood about learning in co-op programs. The field does appear to have matured somewhat from the early research into the educational benefits of co-op by practitioners (Lindenmeyer, 1967; Smith, 1965) that was mainly descriptive and tended not to control for dependent factors such as student ability at entry to the program (Van Gyn, Cutt, Loken, & Ricks, 1997). These early studies were useful but concentrated more on using changes in academic performance, such as grade improvement, as an indicator of educational benefit, rather than on the actual learning experiences that may occur during work placements, and to compare such changes in co-op students with non-co-op students. Some other studies, for example, those looking at the development of practical intelligence and tacit knowledge through co-op placements (Williams, Sternberg, Rashotte, & Wagner, 1992), and a longitudinal project that examined whether participation in a co-op program affected academic progress (Van Gyn, Branton, Cutt, Loken, & Ricks, 1996; Van Gyn et al., 1997) led to tentative conclusions that co-op experience may enhance particular aspects of learning.

Most of these studies have applied quantitative survey techniques and educational achievement instruments, which, whilst providing some useful data, have not identified or explained the various learning outcomes and processes across the diversity of different co-op programs and work placements within programs. Such studies continue to provide data that can explain part of the story (Chang, Chung, & Chiu, 2008; Gomez et al., 2004). However, there have been calls for the use of qualitative inquiry methods that might provide a richer understanding of the nuances of learning in co-op programs (Coll & Chapman, 2000; Finn, 1997; Van Gyn et al., 1997).

Published examples of qualitative inquiry methods being used to explore what students learn through co-op work placements are increasing. Some of the earliest such studies used interviews to gain graduates' perceptions of the importance to their careers and views on self-efficacy of their co-op experience completed 50 years ago (Linn, 1999), and participant observation and interview to study what is learnt and how it is learnt on a co-op placement from a curriculum perspective (Munby, Chin, & Hutchinson, 2000). Eames and Bell (2005) used a longitudinal series of interviews with students as they passed between the educational institution and the workplace to examine the students' perceptions of their learning across the two environments using sociocultural views and concluded that the situatedness of the work placements afforded development of their participation in science practice. A recent critical analysis of interpretive/qualitative studies in cooperative education and internships (Coll & Kalnins, 2009) suggested "that interpretive work is a substantial part of co-op research output,

and that it spans a wide range of programs, disciplines and geographical locations” (p. 1). Clearly, both well-applied quantitative and qualitative approaches to research into student learning in co-op programs have potential to augment our understanding of this area. When this research is underpinned by a strong theoretical base, then we will further our understanding of the outcomes and processes of learning through cooperative education.

CONCLUSION

There is now sound evidence that learning through the co-op work assignment provides a valuable contribution to students’ overall education. A key tenet of cooperative education is that the pedagogical structure of this educational model encourages students to integrate academic and work-based learning. This is supported by a few quantitative studies that have examined various components of cooperative education. These studies have provided useful data but have fallen short of explaining the learning outcomes across a variety of co-op programs. Increasingly, the field has been calling for qualitative inquiry methods to study learning through cooperative education.

One explanation for the failure of a single theory to emerge that explains learning outcomes through cooperative education may lie in the fact that student learning itself is complex. Each of the theories presented in this chapter may hold some validity as an explanation to support the many facets of student learning through co-op work experience. In keeping with the sociocultural views of learning, it may be impossible to separate learning from the social process in which that learning occurs, therefore a simplistic approach to research in cooperative education will lead to inconclusive or erroneous results. We should not shrink from examining multiple perspectives on learning in co-op. In this chapter, we hope to have provided some places from which to begin this examination.

As Bartkus and Higgs note in this Handbook (Chapter 8), there are many avenues available to co-op educators to conduct research, and we call upon all in the co-op community to avail themselves of those opportunities to contribute to the understanding of the learning in co-op. Whether the contribution is from a co-op educator describing the theoretical ideas that underpin their program, or a critical analysis of learning outcomes by a multidisciplinary research team, the contribution will help us build our knowledge and capability for delivering a sound educational program in co-op. As research into theoretical ideas to explain learning in cooperative education progresses, it is imperative that all co-op programs be based upon and evolve within some theoretical foundation of learning. This foundation must underpin the objectives and curricula that we set for our students, govern the pedagogical practices that we adhere to, and allow us to educate our students within programs grounded in research-derived evidence. This approach will help us to have confidence in what we are doing as educators, justify the value of co-op placements, and legitimize cooperative education as a sound educational strategy.

REFERENCES

- Allen, J.M., & Peach, D. (2011). Assessing for work-integrated learning experiences: A pre-service teacher perspective. *Asia-Pacific Journal of Cooperative Education*, 12(1), 1-18.
- Atkinson, J. (1964). *An introduction to motivation*. New York, NY: Van Nostrand.
- Auburn, N.P. (1972). Cooperative education and the development of human resources. *Journal of Cooperative Education*, 8(2), 1-7.
- Bakhurst, D. (2009). Reflections on activity theory. *Educational Review*, 61(2), 197-210.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bartkus, K.R., & Stull, W.A. (1997). Some thoughts about research in co-op. *Journal of Cooperative Education*, 32(2), 7-16.
- Bell, B., & Cowie, B. (2001). *Formative assessment and science education*. Dordrecht, The Netherlands: Kluwer.
- Billett, S. (1994). Situated learning: A workplace experience. *Australian Journal of Adult and Community Education*, 43(2), 112-130.
- Billett, S. (2006). Relational interdependence between social and individual agency in work and working life. *Mind, Culture and Activity*, 13(1), 53-69.
- Billett, S. (2007). Cooperative education: Supporting and guiding ongoing development. *Journal of Cooperative Education and Internships*, 41(2), 37-44.
- Boud, D., Keogh, R., & Walker, D. (1985). Promoting reflection in learning: A model. In D. Boud, R. Keogh, & D. Walker (Eds.), *Reflection: Turning experience into learning* (pp. 18-40). London, UK: Kogan Page.
- Branton, G.R., Van Gyn, G., Cutt, J., Loken, M., Ney, T., & Ricks, F. (1990). A model for assessing the learning

- benefits in cooperative education. *Journal of Cooperative Education*, 26(3), 30-40.
- Brown, J.S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32-42.
- Campbell, M. (2009). Learning in early-career police: Coming into the workplace. *Asia-Pacific Journal of Cooperative Education*, 10(1), 19-28.
- Cates, C., & Jones, P. (1999). *Learning outcomes: The educational value of cooperative education*. Columbia, MD: Cooperative Education Association.
- Chang, W., Chung, R., & Chiu, Y. (2008). Impacts of altruism and self-efficacy on knowledge sharing behavior and the moderating effect of mentor-intern interaction: An empirical study from business internship students. *Journal of Cooperative Education and Internships*, 42, 50-58.
- Cole, M., & Engeström, Y. (1997). A cultural-historical approach to distributed cognition. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations* (pp. 1-46). Cambridge, UK: Cambridge University Press.
- Coll, R.K., & Chapman, R. (2000). Advantages and disadvantages of international co-op placements: The students' perspective. *Journal of Cooperative Education*, 35(2-3), 95-105.
- Coll, R.K., Eames, C., Paku, L., Lay, M., Hodges, D., Bhat, R., Ram, S., Ayling, D., Fleming, J., Ferkins, L., Wiersma, C., & Martin, A. (2009). An exploration of the pedagogies employed to integrate knowledge in work-integrated learning. *Journal of Cooperative Education and Internships*, 43(1), 14-35.
- Coll, R.K., & Kalnins, T. (2009). A critical analysis of interpretive research studies in cooperative education and internships. *Journal of Cooperative Education and Internships*, 43(1), 1-13.
- Cutt, J., & Loken, M. (1995). The nature of evidence in assessing cooperative education. *Journal of Cooperative Education*, 30(3), 24-38.
- Dawson, J.D. (1980-81). The breadth of learning in the cooperative education experience. *Journal of Cooperative Education*, 17(1), 62-72.
- Dewey, J. (1916) *Democracy of education: An introduction to the philosophy of education*. New York, NY: The Free Press.
- Dimenas, J. (2010). Beyond dichotomization: A different way of understanding work-integrated learning. *Journal of Cooperative Education and Internships*, 44, 43-49.
- Doel, S. (2009). Fostering student reflection through engineering internships. *Asia-Pacific Journal of Cooperative Education*, 10(3), 163-177.
- Dubick, R.A., Mc Nerney, R.B., & Potts, B.K. (1996). Career success and student satisfaction: A study of computer science cooperative education graduates. *Journal of Cooperative Education*, 32(1), 66-74.
- Eames, C., & Bell, B. (2005). Using sociocultural views of learning to investigate the enculturation of students into the scientific community through work placements. *Canadian Journal of Science, Mathematics and Technology Education*, 5(1), 153-169.
- Eames, C., & Coll, R.K. (2006). Sociocultural views of learning: A useful way of looking at learning in cooperative education. *Journal of Cooperative Education and Internships*, 40, 1-12.
- Eames, C.W., Kumar, M., Rowe, W., & Hitchcock, M. (1996, July). *The economic value and educational benefits of cooperative education to New Zealand*. Paper presented at the second Pacific Conference on Cooperative Education. Melbourne, Australia.
- Engeström, Y. (1999). Activity theory and individual and social transformation. In Y. Engeström, R. Miettinen & R. Punamäki (Eds.), *Perspectives on activity theory* (pp. 19-38). Cambridge, UK: Cambridge University Press.
- Fenster, M., & Parks, D. (2008). Does alternating and parallel programmatic structure make a difference in student outcomes? *Journal of Cooperative Education and Internships*, 42, 33-40.
- Finn, K.L. (1997). The spaces between: Toward a new paradigm for cooperative education. *Journal of Cooperative Education*, 32(2), 36-45.
- Fletcher, J.K. (1989). Student outcomes: What do we know and how do we know it? *Journal of Cooperative Education*, 26(1), 26-38.
- Gardner, P., & Koslowski, S.W.J. (1993). Learning the ropes: Co-ops do it faster. *Journal of Cooperative Education*, 28(3), 30-41.
- Garmon, J., & Strandberg, K. (1976). Learning objectives for co-op students. *Journal of Cooperative Education*, 12(2), 80-88.
- Giroux, H. (2003). *The abandoned generation: Democracy beyond the culture of fear*. New York, NY: Palgrave Macmillan.
- Gomez, S., Lush, D., & Clements, M. (2004). Work placements enhance the academic performance of bioscience undergraduates. *Journal of Vocational Education and Training*, 56(3), 373-385.
- Griffin, J., Mitchell, D., & Lorenz, G. (2010). A study of outcomes-oriented student reflection during internship: The integrated, coordinated, and reflection based model of learning and experiential education. *Journal of Cooperative Education and Internships*, 44, 42-50.
- Guile, D., & Griffiths, T. (2001) Learning through work experience. *Journal of Education and Work*, 14(1), 113-131.
- Harris, L., Jones, M., & Coutts, S. (2010). Partnerships and learning communities in work-integrated learning: Designing a community services student placement program. *Higher Education Research and Development*, 29(5), 547-559.
- Heinemann, H. (1988). Cooperative education and the academy. *Journal of Cooperative Education*, 24(2-3), 109-119.
- Hennessy, S. (1993). Situated cognition and cognitive apprenticeship: Implications for classroom learning. *Studies*

- in *Science Education*, 22, 1-41.
- Henry, T.C. (1978-1979). Facilitators and inhibitors to the development of cooperative education programs. *Journal of Cooperative Education*, 15(2), 15-23.
- Howard, P. (2009). Articulating the learning: Professional practice made explicit. *Asia-Pacific Journal of Cooperative Education*, 10(3), 177-188.
- Johnston, N. (2007). What aren't we teaching our students? Critical pedagogy and the co-op education curriculum. *Journal of Cooperative Education and Internships*, 41(2), 23-29.
- Kolb, D.A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.
- Laramee, W.A. (1972). Work as education. *Journal of Cooperative Education*, 13(2), 12-18.
- Lave, J. (1991). Situated learning in communities of practice. In L. B. Resnick, J.M. Levine & S.D. Teasley (Eds.), *Shared cognition: Thinking as social practice, perspectives on socially shared cognition* (pp. 63-82). Washington, DC: American Psychological Association.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.
- Lindenmeyer, R.S. (1967). A comparison of the academic progress of the cooperative and the four year student. *Journal of Cooperative Education*, 3(2), 8-18.
- Linn, P.L. (1999). Learning that lasts a lifetime. *Liberal Education*, 85(3), 2-11.
- Mahoney, M.J. (1996) Connected knowing in constructivist psychotherapy. In N. Goldberger, J. Tarule, B. Clinchy, & M. Belensky (Eds.), *Knowledge, difference and power: Essays inspired by women's ways of knowing* (pp. 126-147). New York, NY: Basic Books.
- Munby, H., Chin, P., & Hutchinson, N. (2000, December). *Workplace learning from a curriculum perspective*. Paper presented at the Working Knowledge: Productive Learning at Work Conference. Sydney, Australia.
- Perkins, D.N. (1997). Person-plus: A distributed view of thinking and learning. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations* (pp. 88-110). Cambridge, UK: Cambridge University Press.
- Piaget, J. (1985). *The equilibrium of cognitive structures*. Chicago, IL: University of Chicago Press.
- Ricks, F., Van Gyn, G., Branton, G., Cutt, J., Loken, M., & Ney, T. (1990). Theory and research in cooperative education: Practice implications. *Journal of Cooperative Education*, 27(1), 7-20.
- Rogoff, B. (1995). Observing sociocultural activity on three planes: Participatory appropriation, guided participation and apprenticeship. In J.V. Wertsch, P. del Rio, & A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 139-164). Cambridge, MA: Cambridge University Press.
- Ryan, G., Toohey, S., & Hughes, C. (1996). The purpose, value and structure of the practicum in higher education: A literature review. *Higher Education*, 31, 355-377.
- Salomon, G. (1997a). No distribution without individual's cognition: A dynamic interactional view. In G. Salomon (Ed.), *Psychological and educational considerations* (pp. 111-138). New York, NY: Cambridge University Press.
- Salomon, G. (Ed.). (1997b). *Distributed cognitions: Psychological and educational considerations*. Cambridge, UK: Cambridge University Press.
- Schön, D.A. (1983). *The reflective practitioner: How professionals think in action*. New York, NY: Basic Books.
- Simon, R.I., Dippo, D., & Schenke, A. (1991). *Learning work: A critical pedagogy of work education*. New York, NY: Bergin & Garveys.
- Smith, H. (1965). The influence of participation in the cooperative program. *Journal of Cooperative Education*, 3(1), 7-20.
- Somers, G. (1995). The post-graduate pecuniary benefits of co-op participation: A review of the literature. *Journal of Cooperative Education*, 31(1), 25-41.
- Stull, W.A., Crow, D., & Braunstein, L.A. (1997). An investigation to identify needed research in cooperative education. *Journal of Cooperative Education*, 32(2), 30-35.
- Trigwell, K., & Reid, A. (1998). Introduction: Work-based learning and the students' perspective. *Higher Education Research and Development*, 17(2), 141-154.
- Van der Worm, P.T. (1988). Response to the preliminary report of the ad hoc committee on cooperative education and the curriculum. *Journal of Cooperative Education*, 24(2-3), 120-124.
- Van Gyn, G., Branton, G., Cutt, J., Loken, M., & Ricks, F. (1996). An investigation of entry level characteristics between co-op and non-co-op students. *Journal of Cooperative Education*, 32(1), 15-28.
- Van Gyn, G., Cutt, J., Loken, M., & Ricks, F. (1997). Investigating the educational benefits of cooperative education: A longitudinal study. *Journal of Cooperative Education*, 32(2), 70-85.
- Van Gyn, G.H. (1996). Reflective practice: The needs of professions and the promise of cooperative education. *Journal of Cooperative Education*, 31(2), 103-131.
- Vygotsky, L.S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge, MA: Cambridge University Press.
- Wertsch, J.V. (1991). A sociocultural approach to socially shared cognition. In L.B. Resnick, J.M. Levine, & S.D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 85-100). Washington, DC: American Psychological Association.
- Wertsch, J.V., del Rio, P., & Alvarez, A. (1995). Sociocultural studies: History, action and mediation. In J.V. Wertsch, P. del Rio, & A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 1-36). Cambridge, MA: Cambridge University Press.

- Wessels, W., & Pumphrey, G. (1995). The effects of cooperative education on job search time, quality of job placement and advancement. *Journal of Cooperative Education, 31*(1), 42-52.
- Williams, W.M., Sternberg, R.J., Rashotte, C.A., & Wagner, R.K. (1992). Assessing the value of cooperative education. *Journal of Cooperative Education, 28*(2), 32-55.
- Wilson, J.W. (1973). Cooperative education and degree credit. *Journal of Cooperative Education, 14*(2), 28-38.
- Wilson, J.W. (1989). Assessing outcomes of cooperative education. *Journal of Cooperative Education, 25*(2), 38-45.
- Wilson, R.L. (1980-1981). The national assessment of cooperative learning: A preliminary report. *Journal of Cooperative Education, 7*(3), 26-33.

ABOUT THE AUTHORS

Chris Eames is Senior Lecturer in the Centre for Science and Technology Education Research, University of Waikato, Hamilton, New Zealand. He has 18 years' experience in cooperative education practice and research, including a PhD in theories of learning in cooperative education in the sciences. He coedited the first edition of the International Handbook for Cooperative Education. He is currently involved in mentoring beginning researchers in cooperative education. Email: c.eames@waikato.ac.nz

Cheryl Cates is Director of the Center for Cooperative Education Research and Innovation, whose mission is to advance cooperative education at the University of Cincinnati and beyond through innovation and scholarship. Her research interests include student learning outcomes and assessment. She holds a PhD in Organizational Behavior and Development, with a specialization in Higher Education Administration in addition to an MBA and undergraduate degree in Public Relations. Email: Cheryl.Cates@uc.edu