

A lifespan perspective on cooperative education learning: A grounded theory

PATRICIA LINN¹

Antioch College, Yellow Springs, OH

This qualitative study sits at the intersection of two trends in vocational education. The first trend is a narrative approach to understanding cooperative education learning; the second is a movement away from career development theories toward the view that individuals use work experiences to help construct their lives. Both trends view learning as situated in social contexts and suggest narratives to discover the meanings individuals make of work experiences. A lifespan approach using interviews at or near retirement was employed to add a long developmental trajectory to the study of how cooperative education learning served one group of students across decades. A grounded theory of cooperative education learning was discovered through analysis of two sets of archived data. The theory explored the phenomenon via causal conditions, attributes, strategies, and consequences. The lifespan approach supports other literature in questioning some current practices in cooperative education and emphasizes some of the important contributions that co-op makes to long-term learning. (*Asia-Pacific Journal of Cooperative Education*, 2015, 16(4), 301-326)

Keywords: Cooperative education, lifespan development, qualitative analysis, grounded theory, learning process, learning outcome

Career exploration includes learning both about the self and from the work environment to help with life decisions. While career exploration can be important at any developmental period, late adolescence is a particularly important stage when building self-knowledge can help with school-to-work transitions and work performance (Blustein, 1992; Super, 1990).

There is a long history in the US of a type of educational program for career exploration that combines classroom learning with workplace learning: cooperative education. The first such program in the US was organized by Herman Schneider at the University of Cincinnati in 1916 (Sovilla & Varty, 2004).

Cooperative education is:

...an academic program integrating classroom learning and productive work experiences in a field related to a student's academic and career goals. Co-op provides students with progressive learning experiences integrating theory and practice. As an academic program, co-op serves as a partnership among students, educational institutions, and employers. (World Association for Cooperative Education, 2014-2015)

While other terms such as *work-integrated learning* are used to describe this type of educational model (Gardner & Bartkus, 2014), the program that is the focus of the present study is best described as cooperative education or co-op. From a vocational counseling perspective, cooperative education can be seen as a type of career exploration (Linn, Ferguson, & Egart, 2004).

Career development theory has been transformed recently to focus on the meaning individuals make of their experiences. Savickas et al. (2009) advocated moving away from a focus on single "career paths" and trait theories that linked personality traits to career choices, toward the highly individual process of constructing a life.

¹ Corresponding author: Patricia Linn, Resident Scholar, Antioch College: plinn2014@gmail.com

Not only adolescents will encounter the big question: *What am I going to make of my life?* This question is at issue for everyone as they negotiate a series of major transitions in their lives occasioned by changes in health, employment, and intimate relationships. (p. 241)

From this new perspective, narrative versus objective assessments are recommended to illuminate how adults use work and life experiences to help construct their lives (Del Corso & Rehffuss, 2011).

Fletcher (1990) was one of the first researchers to draw the useful distinction between co-op learning processes and co-op learning outcomes. While the latter variable has been the focus of many research studies, the former one has not (see literature reviews by Bartkus, 2007, and Coll & Kalnins, 2009). As Coll, Eames, et al. (2009) concluded in their study of how integration happened in work-integrated learning, "...it seems little is known about student learning – how this learning occurs and how it might better be facilitated or supported" (p. 15).

Most studies of cooperative education assess learning from a short developmental trajectory (Bartkus, 2007). A lifespan perspective assumes that development continues across our lifetimes, rather than ending in early adulthood. Also, such a perspective views development as having many dimensions, having the capacity to change (plasticity), and situated within several contexts. As educators, viewing our students' development from a lifespan perspective not only illuminates the effects of dimensionality, plasticity, and context on learning, but can give us insights into our own development (Santrock, 2012).

The purpose of this pragmatic, sequential, mixed methods study was to understand how a vocational intervention for career exploration--cooperative education--worked to help students learn, especially learning that those students judged to be important 50 years later in constructing their lives. Quantitative and qualitative data were drawn from two archives to describe the sample and develop a grounded theory analysis about how students learned (processes) from cooperative education and what was learned (outcomes).

Antioch College was chosen as the setting for this study for two reasons. First, because Antioch's program was instituted in 1921 to support general education learning as well as learning in the major, it is broadly comprehensive. Blustein (1997) indicated in a review of career exploration research that narrowly defined exploration interventions might be responsible for the lack of positive outcomes from that research. Second, the archives were accessible, well organized, and carefully documented, including files for graduates from as early as 1938. This allowed flexibility in matching archived data from the college years with graduates at or near retirement who could look back over many years to report on how this program impacted the construction of their lives.

METHODS

Overview

A random sample of those who graduated from Antioch College between 1946 and 1955 was selected in 1996 as part of an earlier study (Linn & Ferguson, 1999). Consent forms and a questionnaire about their post-graduate work histories were mailed to them. A sub-sample was purposefully chosen, then interviewed in 1996 and 1997 about how they learned in college and how that learning related (or not) to their lives and work since graduating. The project was approved by the Antioch College Human Subjects Committee.

Two sets of archived data were available for the current study. The first dataset was archived upon graduation in the 1940s and 50s; it documented the graduates' cooperative education work histories while in college. The questionnaire and the interviews collected in the 1990s comprised the second archived dataset. The present study employed both sets of archived data to develop a grounded theory about the sample's cooperative education learning and how they used that learning to construct their lives.

Setting

Antioch College is a residential, liberal arts college that includes three curricular components: (a) classroom learning, (b) a mandatory cooperative education ("co-op") program, and (c) an opportunity to engage in community-based learning by participating in campus self-governance. In the mid-20th C. era that was the focus for this study, the calendar had six sections: two Fall periods of 8 weeks, Winter and Spring terms of 12 weeks, and two 5-week Summer terms. Students alternated multiple times between terms of study and work, accumulating 20 full-time study weeks and 26 full time work weeks each year, across five years. Co-op advisors encouraged students to work 26 weeks with one employer, however, some students changed employers sooner or stayed with an employer longer. The co-op program was designed as an environmental rather than the more typical vocational model, meaning that students were encouraged to choose work assignments in a variety of fields, not just their major field of study, in order to contribute to their general education. An on-campus archive includes the papers students wrote to credit their work experiences, employer evaluations of their work, admissions essays and a "Life Aims" paper, an assignment that included vocational aims at the start of the program. A second archive includes questionnaire and interview transcripts for a subset of the graduates.

Participants

Graduates from 1946-1955 were the focus of the study. This era was chosen so that respondents would be at or near retirement for the second wave of data collection (1990s), to allow them to reflect on all or most of their work histories. Graduates with complete files in the college archive (N = 404) constituted the population of interest, although a total of 1064 graduates were part of the full alumni database from that era. No systematic factors could be identified that led to complete files for some graduates but not others. A random sample was drawn from this population, to yield 120 graduates, stratified to include 50% women. A total of 73 (61%) agreed to participate and completed a consent form and a 14-page questionnaire detailing their work histories. Details about the questionnaire and quantitative findings have been reported previously (Linn & Ferguson, 1999; Linn, Ferguson, & Egart, 2004).

Thirty-two participants then were sampled purposefully from among the 73 questionnaire respondents for the interview portion of the study, and all who were asked to participate in the interviews consented. Approximately equal numbers of men and women were selected; they were chosen to represent a range of college majors and subsequent occupations; and to reflect high, middle, and low scores on the number of different postgraduate jobs they held.

A total of 17 women and 15 men were interviewed in 1996-97. The interview sample had a mean age of 70.7 years (SD = 3.5, ranging from 65-81 years) when interviewed. The most frequent graduation year was 1952 (1946-1954 were represented). The average number of jobs held across their careers (or careers so far) was 7.6 (SD = 5.0, ranging from 1-23 jobs). Fourteen of the thirty two (44%) had been self-employed at some point during their careers.

Most ($n = 26$) described themselves as retired, although 8 of those 26 were doing paid work in retirement.

As for the interview sample's college experiences, the two most frequent college majors were science/math and social science ($n = 8$ for each) but all other categories of majors were represented (humanities, education, engineering, business, arts and other). The mean number of cooperative education jobs taken while in college was 8.1 ($SD = 2.0$, ranging from 5-13 jobs), with a mean of 5.6 different jobs, 6.2 major-related co-ops, and a mean of 3.3 jobs taken in geographical locations the student had not lived in before. After graduation, 10 completed some graduate school coursework, 11 earned a masters-level degree, and 4 earned a doctoral-level degree.

Interview Protocol and Procedure

Two, one-and-a-half- to two-hour telephone interviews were scheduled for the sample of 32. The first interview focused on post-graduate work and life experiences. Questions included requests for the story of finding the first post-graduate job, descriptions about the participant's work experiences, what strategies were used to move into new jobs or towns, stories of failure experiences, the graduates' supervisory styles if relevant, and stories about recent, new learning.

Then each participant was sent a copy of materials from their archived co-op file (the Life Aims paper, a paper written about each co-op job, and employer evaluations of each work experience). These materials were sent to jog the participants' memories, and so that they and the interviewer would have a common set of documents to discuss. The second interview focused on the graduates' co-op experiences. Most findings in this report are drawn from responses to one open-ended question: "Tell me the story of the co-op experience that was the most important to you (if any)." Participants were encouraged to define "important" for themselves, and they were encouraged to offer as many details as possible. Probe questions were asked for clarification, such as, "Can you give me an example of that?" Both work-related and non-work-related memories of the co-op jobs were welcomed by the interviewer. Other questions in this section included asking about how the co-op program failed to meet their needs, their memories of support or lack of support from their co-op advisors and employers, and their personal theories about how learning happens when students alternate between work and study.

Interviews were recorded with a telephone handset recording control device (Radioshack 43-1237) and a microcassette recorder. Tapes were transcribed verbatim by a professional transcriber, preliminary analyses were completed and results were shared with multiple peer audiences (e.g., Linn, Meisler, and Burns, 1998), then archived until analyzed for the current report. The co-op paper written to credit the experience judged by the graduate to be "most important" was also transcribed. The datasets analyzed for this report included approximately 4000 pages of text. Transcribed documents were entered into NVivo10 to manage the large dataset and for analysis (Richards, 2005).

Role of researcher

I was a long-time faculty member at the institution that is the focus of this report, and an advocate for the educational model in play there. My training is as a developmental psychology researcher, marking the lenses through which I see cooperative education learning. In order to acknowledge and investigate the presumptions and biases inherent in

these roles, three approaches were used. The first was a search for contrary evidence (e.g., little important co-op learning, no evidence of the strategies and consequences discovered here). Second, an audit trail was used during this study to make transparent the source and timing of coding category development. The results of these approaches follow the presentation of findings. Third, early versions of the coding emerging from the data were offered multiple times to audiences of co-op professionals (e.g., Linn, Meisler, and Burns, 1998) with opportunities for feedback built in. Coding was added, deleted, changed, and re-evaluated following these peer feedback sessions.

Delimitations and Limitations

Delimitations of this study included the choice of graduates from only one higher education institution for study, and the focus on one decade of graduates (1946-55). Interviewing graduates of a similar institution with no cooperative education program might have allowed more conclusions to be drawn about the cause-effect nature of educational experiences and consequent learning. The single institution was chosen because it was unique among liberal arts colleges in many ways related and unrelated to the curricular model: political ideology, the importance of the campus community component, and rigorous admissions standards are examples. The era was selected to avoid the interruption of participants' learning experiences by World War II on the one hand, and the timing of the second wave of data collection (the interviews) with a group who were at or near retirement on the other.

Limitations included the self-selection of the sample. Those who were positive about their college experiences likely stayed in communication with the college so that their addresses were available and they were perhaps more likely to choose to participate than those who were missing in the alumni database would have been. Another limitation is that potential respondents who declined to participate were not replaced. These self-selection concerns were mitigated somewhat by comparing available demographic and co-op history variables for those who consented to participate in the study and those who declined. The only variable that showed a significant difference between the groups was number of co-op jobs taken, with participants completing an average of about one more co-op job than those who declined, $t(91) = 2.37, p < .05$. A third limitation was that memory was required to discuss learning from 50 years earlier. This concern was mitigated somewhat by sending each participant their co-op file, which included all co-op papers written to credit their experiences.

World View and Data Analysis Approach

The world view at play for this study was a combination of social constructivism and pragmatism. Social constructivists believe that humans construct meaning from their experiences, hence qualitative interviews are useful to draw out those meanings. Pragmatists use whatever methods are practical to achieve their ends, and focus more on consequences of behavior rather than antecedents, hence the mixed methodology found here (Creswell, 2014).

Grounded theory (Glaser, 1978; Glaser & Strauss, 1967; Strauss & Corbin, 1998) guided the qualitative methodology used in this study. In grounded theory, a substantive theory is generated about a process or action of interest, grounded in the meanings of interview participants who all experience that process. For this study, the interview and co-op paper transcriptions, plus the work history questionnaire comprised the data in which the theory

was grounded. Grounded theory analysis typically has three steps: open coding, axial coding, and selective coding (described below).

The particular grounded theory analysis approach followed here was best described by Kelle (2005), who attempted to resolve a long-standing debate among qualitative researchers about whether grounded theory categories “emerge” without reference to any theory, or are drawn necessarily from some theory of action. Kelle argued that it is impossible for a researcher to avoid bringing experiences and preconceptions to the work, following the initial discovery of concepts during open coding. Therefore, those coded concepts are best considered as relating to one of six aspects of a general theory of action to order and organize them, a process known as *axial coding*:

(1.) phenomena at which the action and interaction in the domain under study are directed, (2.) causal conditions which lead to the occurrence of these phenomena, (3.) attributes of the context of the investigated phenomena, (4.) additional intervening conditions by which the investigated phenomena are influenced, (5.) action and interactional strategies the actors use to handle the phenomena and (6.) the consequences of their actions and interactions. During axial coding the analyst tries to find out which types of phenomena, contexts, causal and intervening conditions and consequences are relevant for the domain under study. (para. 17)

This theory of action and grounded theory as an analysis approach derive from sociology, and Kelle (2005) encouraged researchers to judge whether the six steps apply to their domain of study, in this case a theory of learning. The theory of action was judged to be applicable, because it allowed the disparate aspects of student learning discovered here to fall into place as a theoretical model (see Figure 1), the grounded theory stage called selective coding. Five of the six aspects were used in the model (all except “additional intervening conditions”). Kelle’s (2005) theory of activity was not forced on the data, nor were the data coded to fit the model. Rather, the theory of action provided a welcome framework for the selective coding portion of the analysis, which had eluded this researcher for several years.

FINDINGS AND INTERPRETATIONS

Phenomenon

Central to the model (see Figure 1) is the phenomenon of interest: cooperative education learning.

Causal Condition

The causal condition impacting the central phenomenon was the cooperative education work assignment. While different co-op programs manage work assignments in different ways, at Antioch College, students reviewed available jobs, read other students’ co-op papers, talked with their co-op advisors, and applied for jobs of interest via a resume and recommendation from the co-op advisor.

Attributes

The attributes of the causal condition were selected from archived program materials from the era of interest. The first three were chosen because they were considered key issues in catalogue and other program materials at the time (e.g., Henderson & Hall, 1946); the last attribute emerged as important during coding. The first attribute is the use of co-op jobs that

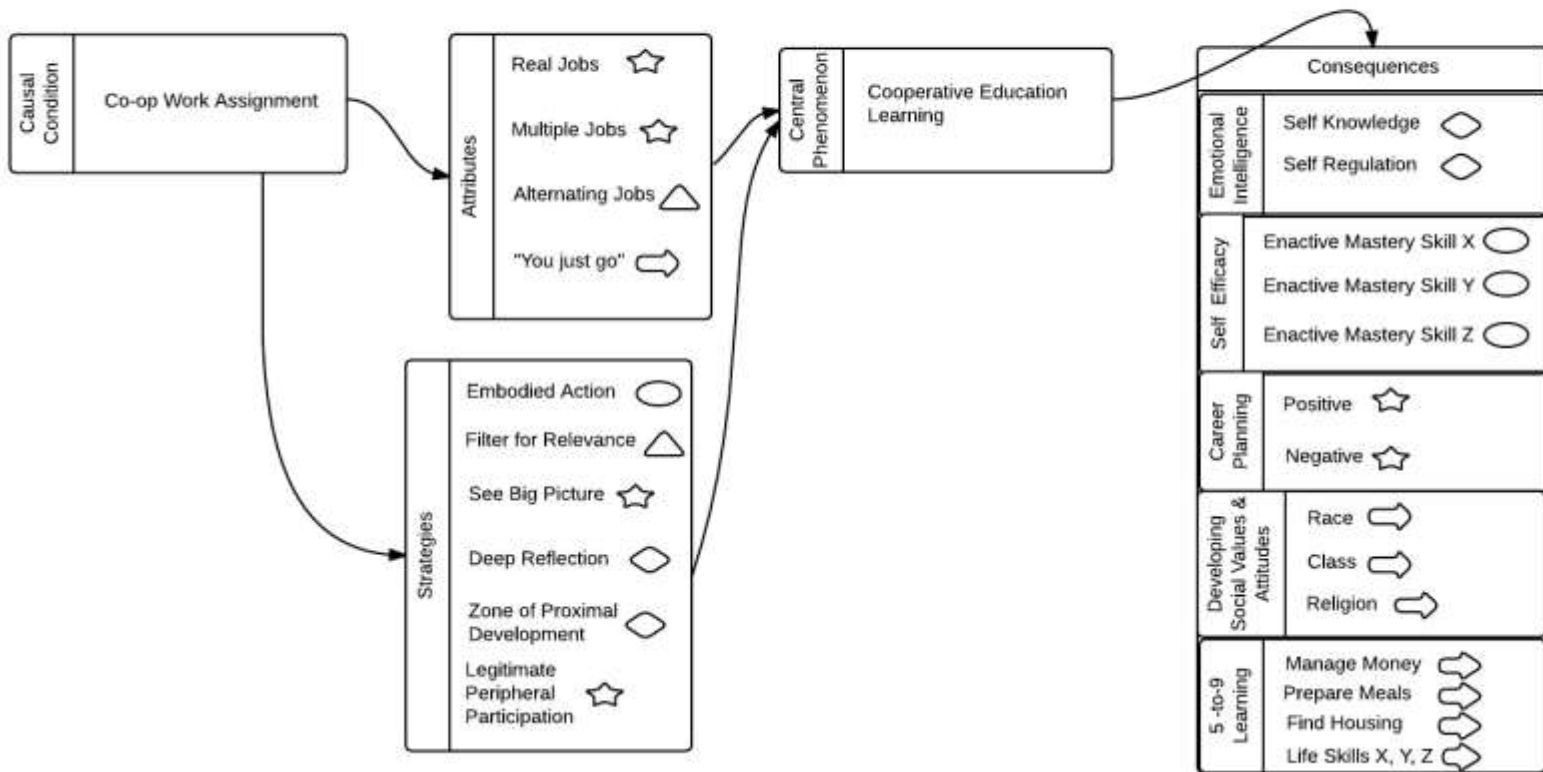


FIGURE 1: The grounded theory discovered from two sets of archived documents about cooperative education experiences from 32 participants who graduated in 1946-1955. Items with same symbol are theoretically and logically connected.

were “real jobs,” i.e., actual positions in a company, museum, school, or other work setting that different students, ideally (but not always) filled year-round. This contrasts with experiences that may be observational or superfluous to job positions in the work setting, such as job shadowing. The second attribute is the multiple work assignments for each student. Multiple work assignments allowed a developmental trajectory of skills and competencies to be experienced. The third attribute was that the work assignments alternated with terms spent on campus, learning from classes and participation in the residential community. Alternating work experiences differ from one-time internships in that periods of reflection on learning from work are built in. The fourth attribute is that most (not all) participants took co-op jobs that required them to move to a location away from campus and their home town, and live more independently than when on campus in a residence hall or at home. The importance of this attribute became evident as participants described learning drawn from moving to novel locations, and was named by one of the participants who summarized such an experience as “You just go.” You do not fret about it, or allow fear to make you lose your nerve, you just go.

Action and Interactional Strategies

These were the strategies that the participants used to enable the phenomenon of cooperative education learning, the next aspect of the general theory of action (Kelle, 2005). These strategies get at the heart of the study’s goal of discovering how learning happened for the participants.

Six strategies were discovered in the interview data as frequently used means to cooperative education learning: embodied action, filtering for relevance, seeing the big picture, deep reflection, entering a zone of proximal development, and legitimate peripheral participation (see Figure 1).

Strategy 1: Embodied activity. The choice to start with embodied activity is not a random one. The long-held bias of separating the mind from the body is giving way to neuropsychological evidence that mind and body are linked in learning (Clark, 2008; Rambusch & Ziemke, 2005). Learning theories such as situated learning (Lave & Wenger, 1991) and tacit knowledge (Wagner, 1987) support the notion that embodied activity is key to “knowing how” versus “knowing that”. The participants described embodied action on co-op, often contrasting it to more passive learning in the classroom. For example, a chemistry major recalled acting as a laboratory assistant for three companies across six co-op assignments from 1947 - 1951, and described such activities:

It was pretty straightforward--you've got to run an experiment, you're going to try four different chemicals to see how they affect the end product, you do it at 5, 10, 15 and 20 percent, and you see what the results are.... You know, we're doing distillations, we're doing mixing, we're doing separations, we're doing analyses.

Notice the focus on doing; this activity of learning denies a dualistic split of body and mind. Active learning also suited some participants better as learners: “I was one who was too antsy to spend the whole school year in the classroom”.

Strategy 2: Filter for relevance. The second strategy discovered in the interview data as a means to generate the central phenomenon of cooperative education learning was filter for relevance. This is from a 70-year-old woman who was a sociology major and later became a librarian:

And to me, my way of learning, maybe, it's just basic. I mean, it's the touch with reality. The classes were extremely stimulating, I loved them....But that was one part. I mean, what was the use of it unless you were going to have it filtered through you... and you were then in touch with the world...

This participant saw herself as the filter for the classroom learning being tested for relevance to "the world". Here is another take on the same idea, from an Education major who became a college professor:

But still, I think so much of work is... a chance to test who you are against...the reality out there on the job situation, and to decide, then, to take what you think is pertinent, that would be valuable to you, and to reject the rest.

This filtering seemed to go two ways: figuring out how knowledge imparted in the classroom fits with real-world reality as experienced on co-op, and sifting through skills from the co-op job to help with classroom and subsequent work assignments. Here is an example of the latter type of filter, from a 78-year-old man who graduated in 1949 as a business administration major, and retired as Vice President of a bank:

...after the War, my first semester... I got a D in accounting, and then...I was assistant manager first of the book store and I had to put accounting into use and after that I got A's in accounting.

The subject of filtering incoming information for relevance has become crucial as information overload has become a ubiquitous outcome of the pervasiveness of the internet and social networking. The participants of this study, even though their classroom, work, and community engagement activities occurred prior to this information explosion, provided examples of filtering through all they were learning for what was relevant. Filtering is considered one effective countermeasure to information overload (Eppler & Mengis, 2004). While students in the classroom are often told exactly what to learn, students learning from work, especially in a novel setting, must learn to figure out for themselves what is useful. One unanswered research question is whether students who learn in multiple settings develop strategies like filtering for relevance that can be useful in later life.

Strategy 3: See the big picture. The third strategy described by participants as promoting co-op learning is see the big picture. This strategy involves a new gestalt or perception of the workplace or living environment whereby details recede into a more encompassing framework. Our chemistry major who worked in three different industries concluded from the materials he tested:

You want it to stick better or fall off or melt or not melt, you know, and so you design your experiments to test the range of options, and then you pick out the best.

A management engineering major developed a "big picture" understanding of how to manage people when he became increasingly successful in encouraging workers under his direction to meet deadlines:

You didn't tell him. You came up and you kidded with him and you schmoozed with him: When did you think he was going to have it done? And he'd say three weeks from now, and you'd say... the due date... is 10 days from now, not three weeks from now. And he'd say, well, I don't know. I said, you know, this is an important job for

the company, there's a lot riding on this... I've got to go tell [the boss] if I'm not going to make my dates.

Coll et al. (2009) heard in their interviews with employers a recommendation that co-op students cycle through every aspect of a workplace, including going through employee trainings just like any other new employee, as a way to develop a broad perspective on the industry. Another study relevant to encouraging a student to lift their head up from daily work assignments to observe a broader context was completed on this same dataset: when co-op jobs were coded by both their specific functions and their broader contexts, graduates' later career choices were more likely to match the broader context of their former co-op jobs than the specific function (e.g., a graduate who became a lawyer rather than a clerk even after serving as a clerk in a law office during co-op) (Linn, Ferguson, and Egart, 2004).

Strategy 4: Deep reflection. Reflection beyond the superficial and with a critical component was the fourth strategy related to co-op learning discovered in this dataset; participants reported such reflection happening years after the experience. Critical reflection challenges the basis of our beliefs, promoting a deep level of learning (Mezirow, 1990). After multiple passes through the data, two "red flag" indicators were found to signal a deep reflection. One such indicator was the use of metaphors to describe their learning; the other was a deprecating comment about a story.

A metaphor, the rhetorical device used to equate one thing (literal) to another (figurative), has been described as a bridge that brings an interviewer and respondent closer together (Gendlin, 1995). Metaphors often have an emotional component, and are necessarily incomplete as they focus on one aspect of a situation to the detriment of others, inviting dialogue. They indicate critical reflection, a way to mediate among one's experiences, knowledge, and embodied action (Gray, 2007). Metaphors and similes (a comparison using "like" or "as"), were coded together here as metaphorical speech. Here is an excerpt from an interview of a 67-year-old engineer talking about a co-op job doing statistical and clerical work at an airfield in 1948:

Every once in a while I'd go over to the [project test field] and they would use me for a guinea pig for various tests...and the best thing about it was I had a lot of time in between tests, so I spent a lot of time in the library, reading the *Journal of Psychosomatic Medicine* and some of the other psychological books...which was kind of fun...But I was just soaking up all the different information I could get.

This student was a sponge, soaking up information.

Here is an example that combines a deprecating introduction and metaphorical speech. The speaker was an English major at Antioch who was 68 when I talked to her, about her co-op experience working in a children's home:

I don't know, but I just suddenly thought of a stray thought that doesn't really exactly bear on this, I don't think-- but yet I'm connecting it...college students never get time to read. And Antioch gave me time to read because I was on co-op. And while I was on co-op I think I deepened my relationship with learning by selecting my own books.... any experience that deepens one's whole reservoir of experience enables one to attract learning, that's the word, attract learning like a magnet when you get back into the classroom.

While the metaphors are mixed, between the reservoir of learning and the student-as-magnet, deep reflection is evident. Note also the deprecating lead-in to the story: it was just “a stray thought”.

Here is a third example. Note the conflicting descriptors of the importance of the story at the end. Such deprecating or conflicting descriptors became evident only after multiple passes thorough the data -- they often signaled, “here is an important story”. These are meta-cognitive indicators of deep reflection (i.e., thinking about their thinking as they wonder if the story is important enough to relate):

One of the guys I worked with...he was a big gambler and we would be out on...service jobs, and I used to drive and he would sit there reading the racing form all day. Then we'd have to stop about every hour so he could call his bookie. I think that kind of convinced me that gambling...was just plain stupid. This poor guy lost...sometimes he'd win, sometimes he'd lose. He was so wrapped up in the horses that he finally bought a racehorse, and it would either get scratched or come in last. I just watched this guy basically ruining his life...I don't buy lottery tickets or anything now, because I can see what it can do to somebody...I think that was a profound influence on my life. A very small incident, but...

Strategy 5: Zone of proximal development: The fifth strategy discovered to promote co-op learning describes a complex transaction between the employer and the student. Lev Vygotsky (1978) labeled this space as a zone of proximal development. This graduate described such a zone clearly from a work term at a college physical education department:

I think I told you about [employer name]...having me address the freshman class.... [H]e...offered me a situation that was highly challenging and perhaps difficult and maybe a touch threatening, but within my capability. He seemed to know better than I what that capability was.... And, yes, I did it, and it was a great satisfaction, just great. And yet I've been in some situations which were just too difficult and I've backed away from them, you see. So, yes, indeed, the secret is to get into things that are challenging but within your capability and not overwhelming. And they come around fairly infrequently, don't you find?

To Vygotsky (1978), this zone comprised the area between what is comfortably known to a learner and what is unknown. When instruction and mentoring are focused just outside the learner's reach, the learner is likely to accept the challenge, and carry skills away for the next similar challenge. Here's another example, from a conversation with a 68-year-old graduate about a co-op paper describing her work at a rural school in Illinois in 1948:

That report is so good because it details how gently I was developed as a teacher by those two women... who had conferences with me every week, and never gave me too much responsibility, yet let me develop my own initiative, about the interests I had in nature and in dramatics.

Her review of this co-op paper led to the awareness that the “creative dramatics” she taught early in her career was not, as she had thought, invented by her, but was drawn from the mentoring she had from two experienced teachers at this rural school.

Eames and Bell (2005) found that employers used scaffolding (another term from Vygotsky, 1978) to help bring co-op students into scientific communities of practice. The scaffolding included mentoring, modeling, and storytelling to support students as they entered those

zones in between where they were already competent and where they hoped to become competent.

Strategy 6: Legitimate peripheral participation. The final strategy discovered in these data to promote co-op learning was stimulated by multiple co-op assignments across time. Lave and Wenger (1991) used the term *legitimate peripheral participation* to describe a phenomenon they observed in studies of young apprentices around the world. These authors claimed that all learning is situated learning: a social process, whereby learners enter a community of practice, and are encouraged to do legitimate work, even if initially it is peripheral to the main practice. Eames and Bell (2005) and others have noted the logical link between this theory of learning and cooperative education work experiences, but the link has been evasive to demonstrate with data. After many hours of talking with Antioch co-op graduates about their multiple co-op assignments and subsequent career choices, examples of such a process became evident. Here is an example from an engineering major who went on to a successful career in engineering:

I had had some surveying courses...at Antioch, and I was working with an experienced surveyor.... They had a three-man surveying crew, but we only had two of us, so I ended up... doing a lot of extra work, more than we normally would. So I got a chance to run the instruments and record the data.... I did all the different jobs that a survey crew would normally be doing, so I learned an awful lot more about that. And then when I was in the office, I'd kind of forgotten about it, but reading that report, I ended up designing a compressor station installation. When I went back [to the job a second time], I was in the office that particular time. And it was very interesting. It was mainly a drafting job, but you had to do an awful lot of calculations and...figure out how to fit the pipe fittings together, so it was a master plumbing job, really. I had help, a couple of other draftsmen there that helped me, but an awful lot of it was just figuring things out myself.

Here is an example from the sciences:

Well, let's see, I had three [co-op jobs] in chemistry...You know, I kind of started at the bottom and the first one was pretty basic, [job 1]. That was my first job in chemistry, and there wasn't too much technical they could give me to do until I learned how to do it. The second one, [job 2], I think I was more adept at chemical technique so that I could do the laboratory work at a higher level than I could when I was at [job 1], so I had more responsibilities there but they were still lab technician responsibilities....And by the time I got to [job 3]... I didn't have to have too much individual instruction as to how to set up an experiment or how to conduct it....

The multiple communities of practice to which these students were exposed were described this way by another graduate:

...it's how I learn. I learn much more easily by doing something than just being told about it. So... it's almost like you become more of a Renaissance person, not just because of...the courses that you take in a liberal arts program, but you...can be exposed to many different facets of life.

This "Renaissance" type of education, promoted by multiple co-op jobs (some related to the major, some chosen to stimulate a general-education breadth), became useful as these graduates went on to take an average of 7.6 different jobs across their careers (range = 1 - 23

jobs). Handling change may be facilitated by serial experiences of entering communities of practice, as work settings or college general education requirements.

Consequences

The final aspect of Kelle's (2005) generalized theory of action used to organize concepts in this grounded theory falls on the right side of the model (see Figure 1): the consequences of the central phenomenon, cooperative education learning. Here the focus is on *what* was learned.

Knowledge, skills, and attitudes were all impacted by co-op learning, according to the study participants from their perspective 50 years after the learning experience. Some learning consequences fell into categories; category labels were derived from concepts found in the research literature (see Table 1, origination of meta-concepts from the literature. These theoretical concepts were not coded from the interviews per se, but were found useful to cluster other codes that were drawn from the interviews, an approach recommended by Kelle (2005). They included Emotional Intelligence and Self-Efficacy.

Single consequences (with no need for a conceptual umbrella) discovered in the data included positive or negative career planning, developing social values and attitudes, and 5-to-9 learning.

Emotional intelligence. self-knowledge and self-regulation are two of the four core skills that make up emotional intelligence (Goleman, 2005). There were many examples of self-knowledge that participants described as coming from their co-op experiences. Here is one example from a woman who was a biology major:

You just have to go.... I think it was a great experience, learning to arrive in a [train] terminal and make your way somewhere on your own. Now, I don't know, maybe some people weren't ready to do that. I was....I think you...learn what you like, whether you like constant companionship and company, or whether you like being by yourself.

Here is another example of learning about the self from an education major talking about accepting negative feedback from an employer:

Oh, maybe it made me accept myself a little bit more to know... that didn't crush me at all. And, yes, I could learn a little bit from it, I could learn to be a little tamer, a little more sedate, and certainly I practiced that in my teaching.

One participant did a co-op in Finland, and offered a different type of self-knowledge:

I remember my first experience with saunas in Finland. ...[Y]ou take a sauna and then you leave there without anything on and you go down to the lake and you jump in the lake and you swim around and then you come back to the house and you put your clothes on. And I remember having nightmares, trying to figure out what would I do if I saw somebody in the path....But, you know, that whole thing kind of cleared something in my mind. I mean, once I learned how to do the saunas--it was perfectly safe, and nobody was shocked about anybody. It was a freeing experience for me. Yes, I think that has carried, definitely, through.... this is my body and this is the way it looks and it's okay.

Participants described two areas of self-regulation development as particularly important across their careers: adaptability/flexibility, and overcoming fear. This engineering major described how he learned to adapt to people he encountered in his co-op jobs, and how that was useful in the 16 different jobs he held between graduation and retirement:

Some of the jobs you encounter people that... offer a challenge in view of how they perceive things being done, or how they interact with you, and so that leads you to become pretty adaptable--if you're going to make the company succeed, then you don't want a lot of infighting, so you have to learn to extract the best possible solution to the problem by working with people that sometimes don't want to work with you. And so I guess I consider myself being able to meet those kind of challenges.

Managing one's emotions including fear was evident from a sociology major who became an administrative assistant:

Well, I...never thought I would venture very far....[M]y father at one time said to me, if you were living in Brooklyn--we were living in the Bronx...--I would feel like you were lost to me forever.... And then I was 16 and I went to Yellow Springs, Ohio, and I never went home....I went home for visits, but that was it. And afterwards.... I just landed in all kinds of places....I mean in strange places, not knowing anybody, and I made it. And I think probably the most dramatic example of that was when my husband died quite suddenly, and there I was in the Washington area with no job, no source of support, and three little children, and knowing nobody. And, you know, I made it, and I think the Antioch experience had everything to do with not being afraid.

An engineer who graduated from Antioch College in 1952 recalled a co-op job drafting and surveying for a gas company. The company piped natural gas from the southern US to the colder climates in the north. He was 67 when I interviewed him; here is what he recalled:

About two weeks after I started we got a call from the headquarters that they had a pipeline break due to a flood down in Kansas and they wanted somebody from the engineering department to represent the company down there while they were fixing it. Railroad cars washed off their tracks, the smell of mud and death – everything is just kind of covered with silt and it stinks. So it was a fantastic experience, seeing a major construction project going on under extremely difficult conditions. I even got a chance to fly an airplane. The pilot was tired and wanted to take a nap so he let me fly from St. Louis to Detroit while he slept... "Wake me up if something happens," he said.

This student was able to adapt to "difficult conditions" but was also flexible enough to take up quite a challenge: to fly the airplane home.

Self-efficacy. The second set of learning consequences from cooperative education for these participants is best described under the umbrella concept of self-efficacy. Bandura (1986) described the way self-referent thought mediates the relationship between what we know and what we are motivated to do: "perceived self-efficacy is defined as people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). It appears from Bandura's work that a cognitive process of calling yourself competent in situation A or B or C may lead you to approach—not all tasks—but a similar task with confidence the next time.

The main source of self-efficacy beliefs is enactive mastery or one's actions that demonstrate mastery of particular skills. The strategy of embodied action described earlier is at play here. Because cooperative education (especially multiple assignments in different jobs) yields such mastery experiences, Fletcher (1990) and others have linked co-op to self-efficacy. Here are two examples of such skill-building on co-op:

I had been taking the course in quantitative chemical analysis, which requires the development of a pretty precise lab technique, and I just didn't have it....I passed the theory part of the course, but I flunked the lab first quarter. And I went off on a coop job.... And I was doing quality control work in a lab there and learned to use an analytical balance and other equipment on that job. When I got back to college I took the first quarter lab part over, along with the second quarter lab, and of course the theory, and on the basis of my lab technique that I evidently developed on the coop job I was able to pass the lab the second time.

And:

You see, the most important thing for me...was working on sets in the theatre, because-- And there was one man that somehow was aware of my fear... in the area of spatial relations, and he helped me. He...helped me learn to build what we called a practical stairway for the set, and it worked, it was solid. And for me it was like, this is a weird expression to use, but it was like coming home.

Here are examples of skills that were learned at work on co-op assignments, named by ten different participants:

...to do red counts and white counts and sed rates... just learning manners... we had to give them tests to determine whether or not they had some ability...I got a chance to run the instruments and record the data... how to set up an experiment...I learned how to do frozen sections and paraffin sections...make these India ink drawings on linen paper... and I really became a good arc welder... then the telephone operator took off, so they gave me that job...I was able to actually design this whole Boy Scout camp...how to keep records... learned to use an analytical balance...designing a compressor station installation...introducing new games...

According to Bandura's (1986) theory, successfully grasping each of these skills would lead to approaching the task again, and confidently performing that task at another time or in another setting. The specificity with which self-efficacy is manifest (i.e., approaching skill "X" with confidence if it had been performed successfully before), suggests that multiple, different co-op assignments may be more likely to build efficacy, rather than a more generalized state of self-confidence. This participant summed up the self-efficacy consequence nicely:

I just never thought that I was doing that great academically in chemistry. But then when I would get on the job, everybody was terribly impressed with what I was doing. And I learned so much from the people who were out in the field working and as a result, when I went to work after I graduated I just felt so very comfortable in knowing what I needed to do in the lab, how to keep records, how to be consistent in my setup, how not to introduce other variables that could influence an experiment.

Raelin et al. (2011) provided some support for adding work self-efficacy to existing measures of career and academic self-efficacy. They found that work self-efficacy was enhanced for

cooperative education students compared to those who did not choose co-op when demographic and support factors were controlled.

Career planning. This is an often-named outcome of cooperative education (e.g., see World Association for Cooperative Education, 2014-15). Career planning is described as either positive (deciding what you want to do after graduation) or negative (deciding what you do not want to do). “Certain options will appeal (or seem more or less viable) to an individual compared with other options given his or her interests, values, talents, resources, and experiences” (Lent, 2011, p. 4). Career planning in both directions was a consequence of these participants’ co-op experiences. Here is a positive planning experience:

Well, I think that what happened was that the co-op experience allowed me to test [a career managing people], and all of my jobs on a co-op experience were in that field. And it just kept getting better and better, kept confirming that this is what I'd like to do.

And a negative career planning example:

... I learned from that I would never want to work in a hospital. I don't work well in a very hierarchical, controlled setting. I learned that.

These examples support Lent’s (2011) conclusion that “...the notion of a passive, static worker was always a fiction...” (p. 5). The participants continued to make active choices as their circumstances, relationships, and values changed and evolved, as evidenced by their average of 7.6 different jobs before retirement as well as the 44% of them who chose to be self-employed during their careers (Linn & Ferguson, 1999).

Developing social values and attitudes. This next consequence of co-op learning occurred as these participants left the relatively comfortable confines of their homes and their college campus to work and live in new places, where they encountered people who differed in race, religion, and class.

I was working second shift – and I told them I was there to turn off the gas and the guy pulled a knife and said I wasn’t going to turn the gas off. And one of his buddies grabbed him, took the knife away, and said, hey, man, he’s just doing his job...and it wasn’t just the Black people, because on the west side of Detroit...was the poor white slum, and it was the same thing...most of them were decent people and they were having a hard time, struggling with existence. I kind of led a sheltered existence when I was growing up.

And:

...[I]t was a settlement house....So I had the Girl Scouts, and a thing came from the Scout office in Chicago that all the Girl Scouts were going to meet at a park and get together. So I called the office and I said, is there any way that you could help my troop get uniforms? ...[W]ould any of the troops up in the suburbs of Chicago to the north have ones that they were outgrown, or...could you do anything for us? And the answer was no....So I remember that, and being somewhat disillusioned by that.

Here is a quote from a co-op report found in the College’s archive — this one written in 1946 by a woman who was a political science major working at the Research Institute of America, living for the first time in New York city:

One-hundred-eleventh Street is not a slum. From the outside it looks like a good section. Yet I feel now that I have a little more understanding of these conditions. Not only is it true that there is little time to clean house after work, but also no one likes to take a bath in a tub from which the cockroaches have to be swept, and with only two burners, it is hard to eat enough vegetables for a balanced diet. One finds oneself living on bread to a large degree. This is interesting to watch for a short period when one knows that one can go home again at the end and be just as before; only...knowing when one reads that federal housing projects are a waste since there is a class of people that ruin any place they get into, that it is rather the place that ruins the people.

She went on to be a union organizer in the meat-processing plants in Chicago. There is some research evidence to support that experience with diversity can impact college students' critical thinking skills (Laird, 2005). Because few classrooms in this era offered a strong curriculum to help students analyze systems of oppression, it was the co-op experience that put "flesh on the bones" of learning how poverty, religious intolerance, and racial prejudice impacted lives.

Five -to-nine learning. Learning from work assignments, usually between the hours of 9 am and 5 pm, has been the focus of the findings so far and the focus of almost all research studies of cooperative education learning. However, another set of learning consequences was discovered in the process of developing this grounded theory, learning that the participants saw as crucial to the people they became 50 years later. When these students were assigned co-op jobs away from campus, especially in locations that required them to live off-campus and away from their families of origin, learning continued after work and on weekends: what is called here "5-to-9" learning. Self-sufficiency resulted, as students learned how to find housing, to manage their money to pay rent, to cook when they relied on themselves to eat, and other life skills including finding their way in a new city. They also continued to develop social values and attitudes as they learned to get along with people and systems they encountered outside of work.

This biology major learned about how to manage money, and learned to choose jobs so that she could meet her financial goals:

...I always tried to have enough money to get home [laughed]...when the job was over, so that nobody had to send me money.... I think it made you more aware of...how much you felt like you needed to make, or that this was a piddly amount of money you couldn't live on it.... I think it was a great experience, learning to arrive in a terminal and make your way somewhere on your own. Now, I don't know, maybe some people weren't ready to do that. I was.

Here's a story about learning to prepare food from an English major who became an anthropologist:

And I remember the personnel woman of the factory who felt some sort of obligation to me as kind of an intern and so on, inviting me to dinner once at her house, and she said, you make the salad. And I didn't know what to do, I didn't know how to tear up a piece of lettuce. She showed me how to cut an onion, and she showed me how to cut a tomato up, and so...I was glad to be learning these things.... [W]hat we were demonstrating was our capacity to improvise and to live in the world.

Here is another cooking story, one that also describes sharing such duties on a co-op in Chicago; again, the learning went beyond the meal, to another way to “live in the world”:

... I think there were 10 of us girls--I think there were about 24 altogether, the guys lived upstairs. And we had a dinner plan, whereby the people that worked closest would shop for the meal and start cooking it, and then the next batch of people would arrive home, would finish cooking it, and we who worked in the Loop, we were the last ones to come in...Yeah, we got to clean up.

Self-sufficiency resulted from taking responsibility for where and how they lived. Here is a story from another sociology major who became a public health administrator:

... I went to New York. And having come from Chicago, I had a sense of city, but it was kind of the first time where I went to a large city where I knew no one. And I really had to sort of move myself in whatever direction....I started out at the Y because I figured Y's are safe, and go from there, and then did the looking for places in newspapers and found a something like fifth-floor walkup, and I had no idea that you had to walk those steps. At any rate, I learned that one too and...found a room that must have been about the size of a closet, but big enough for a bed and a dresser. But that allowed me to save some money...

The story above represents the development of a schema, or cognitive framework, for how to enter a new city. Many other 5-to-9 skills were recalled, for example this set of skills named by a group of seven different graduates:

Volunteering to serve as a Boy Scout scoutmaster...I had to iron starched white uniforms, and they're not easy to iron...I learned how to dance, learned how to play blackjack... learning about riding a horse... we hitchhiked...how to get from here to there...and you make friends with somebody in a little luncheonette or somewhere... I learned how to do the saunas...we did our own thing sometimes, and did things together other times...what I remember is meeting men and learning about men....you learn about life.

Becoming aware of social justice/injustice also continued outside the workplace while on co-op. This incident was observed in the neighborhood where a sociology major was living:

One day--God, this is awful--a Black driver drove his car through the neighborhood, and the people stopped and started clubbing the car. And then, it was my...first viewing of what is called a part of collective behavior, which I later studied [in graduate school].

Friends in the rooming houses also helped these students develop a social consciousness:

When I was in Chicago and we were living with all these, what, 25 co-ops, and we used to have bull sessions at night, and we got on the subject of Catholicism one night. And I don't even remember what it was about but I was outspoken in my contempt for the Catholic church and its policies. And the next thing I knew-- There was a great big bathroom on the first floor, and we were all in the bathroom sitting on the edge of the tub, and two of my closest friends, who were Jewish guys, they set me on my ear, and said how prejudiced I was and get off it, lady. I've never forgotten that session or the lesson that I learned.

This participant summed up the importance of 5-to-9 learning, even though that type of

learning was not encouraged in the reports students wrote to credit their co-ops:

I think that's a good thing that you learn to do and do on your own, but there's no mention of that in job reports. In fact, the only part of, the only good part of [the co-op report] would be your work experience, and I don't see that that way.

In their interviews with employers focused on integration of theory and practice, Coll et al. (2009) reported one employer describing this type of 5-to-9 learning:

Leaving home and the comforts of home potentially being forced into an environment where it's you and only you and accountability and having to learn how to budget and having to learn, so it's quite a daunting role going off to uni from that point of view. So I think you learn a hell of a lot of life skills, I think it's your first sort of really understanding life skills... (p. 28).

Other than this instance, it has been difficult to identify other research on cooperative education learning that ventures to look outside the workplace for memorable learning for students.

Contrary Evidence

One approach to checking one's biases and assumptions is to search for evidence that is contrary to the flow of the findings. In this case, such evidence might include participants who did *not* feel that they learned significantly from the co-op program in the ways described here, or a search for presumed strategies or consequences of the central phenomenon that came up empty (Kelle, 2005). Both instances occurred in this analysis. Four of the 32 participants did not feel that the co-op program was significant in their development, or significant in the ways discovered for other participants. This from a music major who went on to a career in that area; he disagreed that co-ops were an important source of "5-to-9" learning:

For example, learning how to live in a city and commute and live inside a budget, of course that's important, but we all manage to get there one way or another, whether we go to Antioch or not. So I think for Antioch to claim that that's a virtue of the co-op system is a little bit gilding the lily.

Here is another example of a participant who didn't find many long-term benefits of the co-op program, particularly in terms of career planning. He was a biology major who became a librarian, then a minister, and finally a chemist:

...since my career was so various, and part of it was so different from what my major was at Antioch, I don't have any impression that the co-op experience had a huge effect on my subsequent career.

A third example of a participant who found the co-op program lacking is from a liberal arts major who became an actor. Describing a difficult period in his life, he said:

I keep thinking, if only when I was at Antioch this had been awakened in me somehow, saying you can create your own world, you can carve that out, you can make new grounds...

And finally, this from a chemistry major who became a chemist. He was aware of the pressures on the co-op advisors to fill their jobs each term:

I actually, if I recall correctly, only had three basic co-op jobs. None of them do I think really dovetailed with what I wound up doing.... I think that... my advisor really had a number of slots that had to be filled. I think the pressure was on him to get students into those jobs so that they could be retained....They didn't understand our horizon one iota. So it was not what I would consider a real good experience, what I thought a co-op program should be.

No program is effective for all students, and it is useful for faculty and staff facilitating co-op programs to learn more about students for whom the program is not effective, especially given the additional time to graduation that some co-op programs entail.

A preconception that was not supported by the data was investigated with an interview question about whether the participants encountered contradictory approaches to a work problem or task espoused by a co-op employer versus a classroom teacher. Perry (1981), a Piagetian who studied Harvard men's development across the college years, had described one impetus for moving beyond assimilation to accommodation: when knowledgeable authorities disagree, the student is forced to abandon the notion that knowledge is certain, and accommodate by embracing uncertainty. My presumption was that co-op would provide many such opportunities, as students learned one approach to a problem or task in the classroom, then travelled to a co-op job where things were done differently, or vice versa. This developmental leap would have been a particularly important consequence of the co-op program: Baxter-Magolda (2000) called this developmental step "The Great Accommodation" because of its central place in intellectual and emotional growth. Each co-op paper that was read and each interview were searched for such an instance, but no examples were found.

Audit Trail

Constas (1992) argued that qualitative researchers should make their category development process public in order to increase the credibility of qualitative findings. He developed a set of queries about three different components of coded categories: What were the categories' origins, their verification, and their naming? Constas also specified a temporal dimension for each query: Was each category component developed before data collection (a priori), after data collection (a posteriori) or with a constant comparative approach typical of grounded theory methodology (iterative)? This work constitutes the audit trail and is shown in Table 1. For example, three of the attributes originated a priori, were verified from external documents, and were named with language used in program materials. The fourth attribute ("you just go") originated from the participants in the iterative coding process, was verified in reference to the study findings, and the name was drawn from a participant's quote in a process known as "in vivo" coding.

A final comment about Figure 1 has to do with the symbols added to the attributes, strategies, and consequences. Items with the same symbol were linked both in the data and logically. For example, participants described learning consequences like developing social attitudes and 5-to-9 learning when talking about co-ops in novel locations ("you just go," a link within the grounded theory), but it also follows logically that learning to find housing would occur when "you just go" to a new city.

TABLE 1: Audit trail of category development

| Component of Categorization | Temporal Designation | | |
|---|--|---|--|
| <i>Origination: From what authority?</i> | A priori | A posteriori | Iterative |
| Participants | | | Attribute 4, plus all other Strategies and Consequences NOS |
| Programs | Attributes 1-3, e.g. "real job" | | |
| Literature | Axial categories (Kelle, 2005), e.g., "strategy" | Meta-concepts, e.g., "self-efficacy" | |
| Interpretative | | | Metaphorical reflection |
| <i>Verification: On what grounds justified?</i> | | | |
| Referential | Axial categories (Kelle, 2005), e.g., "causal condition" | | Attribute 4: "You just go" |
| External | Attributes 1-3, e.g., "multiple jobs" | | Strategies and Consequences offered to multiple peer audiences and refined |
| Empirical | | Categories are exclusive/exhaustive | |
| Participative | | Member-checking (N=4) | |
| <i>Nomination: Source of category name?</i> | | | |
| Participants | | Strategy "filtering" | Attribute 4: "You just go" |
| Programs | Attributes 1-3, e.g., "alternating" | | |
| Investigative | | | All other Strategies and Consequences NOS |
| Literature | Axial categories (Kelle, 2005), e.g., "consequences" | Some Consequences, e.g., "emotional intelligence" | |
| Interpretative | | | Metaphorical reflection |

DISCUSSION AND CONCLUSIONS

A theory was discovered using grounded theory analysis of archived documents (mainly interview transcripts), describing the causal condition, attributes, and strategies that led to the Central Phenomenon of cooperative education learning several decades in the past, along with the consequences of that learning. The strategies provided evidence of *how* the co-op learning happened, and the consequences evidenced *what* was learned, in the context of the co-op work assignments with the attributes as indicated.

This study demonstrates a rare example of a lifespan perspective on cooperative education learning, made possible by the foresight of librarians, archivists, and graduate volunteers who archived the records thoroughly. The focus of most co-op research is on late adolescence, mimicking the long-term bias in psychology of seeing that as the developmental peak, followed by declines in adulthood functioning until death (Santrock, 2012). The lifespan of our students born in 1990 in the US is about 75 years (World Health Organization, 2015). Rather than continue to focus our research only on students currently in our programs or recently graduated ones, we could save records of co-op work placements and return to our alumni to ask in interviews or focus groups how they are constructing their lives after graduation. This may be a useful way to “walk the talk” of educating the whole student, a goal named in many of our university program materials.

One important caution is to remind readers that qualitative research findings cannot be presumed to apply to other samples than the one that was the focus of the study. Readers are encouraged to consider, for example, how their co-op assignments may or may not match the attributes described here. Readers are also encouraged to consider: What strategies of learning and consequences of that learning are NOT included in these findings? The historical context of the causal condition—co-op work assignments for students who graduated between 1946-1955—adds a further twist to readers’ assessments of the applicability of these findings.

These findings may illuminate the wide range of strategies and consequences that is possible for students to draw from co-op work assignments. The sample consisted of a group of privileged, mainly European-American students, many of whom were war veterans, who chose to attend a selective college with a mandatory co-op program and a reputation for progressive values. Another indicator of the distinctiveness of this sample is the rate with which the participants obtained advanced degrees: 44% of the 32 participants completed graduate degrees, exceeding even the rate reported in Terman’s (1959) “Genius Study” (42%).

By studying the strategies and learning consequences, co-op practitioners or vocational counselors might identify approaches to or consequences of co-op learning that they had not considered, or had considered and discounted before as not sufficiently important or “academic.” Because co-op practitioners work in academic settings, they may be especially attuned to learning that parallels closely their students’ major-related classroom learning. Academic professionals tend to value the head (academic learning) over the hands (vocational learning), and emphasize the former over the latter (Linn, 2004). This differential valuing may lead co-op practitioners to focus on major-related learning to help justify our programs, especially with so many curricular components competing in an era of shrinking university budgets. The emphasis that the participants of this study placed on “5-

to-9” as well as workplace learning suggests we embrace all sources of learning while on co-op.

Arranging co-op learning experiences into this grounded theory model (Figure 1) highlighted how many of the learning strategies and consequences fit with Kolb’s (1984) theory of experiential learning. Many researchers, including Cates and Jones (1999) and Tener (2004) have suggested that Kolb’s theory helps to understand co-op learning. Kolb (1984) described a cycle of learning in which a learner has an experience, reflects on that experience, forms or finds a theory to explain that experience, then tests that theory with further action. The grounded theory presented in the model includes strategies like embodied activity, reflecting on that activity, forming a “big picture” (similar to a personal theory) about what they were learning, then testing that theory against reality as they filtered their experiences for relevance. The best employers set the stage for this learning cycle by offering experiences in the student’s zone of proximal development and, over multiple work assignments in a community of practice, allowed students to move more centrally into legitimate participation in that community. While there is no expectation in the grounded theory tradition that requires linking emerging substantive theories to grand theories, this conceptualization may offer further support for applying Kolb’s theory to cooperative education learning.

Another way to view the strategies and consequences discovered here comes from Gray (2007), who suggested that educators seek to identify processes that “...mediate[s] between experience, knowledge and action” (p. 495). Consider how some of the strategies (e.g., deep reflection, filtering for relevance, seeing the big picture) and the two umbrella concepts in the consequences part of the model (emotional intelligence, self-efficacy) may have served such a mediating role as these students made sense of their co-op experiences and judged them as important 50 years later in the context of their lives. Perhaps an illumination of these mediators as described in this grounded theory offers a small opening into what has been called “the black box” of learning on co-op (Ricks, Cutt, Banton, Loken, & Van Gyn, 1993, p. 11).

There was little evidence in the interviews for this study that the meaning the students made of their experiences was facilitated by writing assignments required by the cooperative education program. Coll et al. (2009) found this as well: “There is no evidence of direct explicit attempts to integrate on-and off-campus learning, although all parties expected this would occur and agreed it should occur” (p. 32). Billet (2006) is another author who has argued that learning strategies from work represent examples of human agency rather than outcomes of curriculum planning, and that students value and learn from discussions with their peers rather than writing assignments. While Coll et al. (2009) argued that educators have to accept responsibility for integration of learning from work, and that without it, “[t]his means the students may not develop the competency to learn” (p. 32), the grounded theory presented here provides evidence that these graduates were perfectly suited to make sense of their work experiences in various ways on their own timeline. This may be attributed to the distinctiveness of the sample, but Billett (2006) found this in a sample of Australian high school students as well.

If writing reports and filling out forms are not effective mediators of learning, this begs the question about how to assess student cooperative education learning. Zegwaard, Coll, and Hodges (2003) argued that such assessments should be meaningful and broadly based in terms of the variety of learning outcomes measured. Boud (2000; Boud & Falchikov, 2006)

further argued that educational assessment should go beyond the typical formative approach (helping students learn) and summative approach (certifying learning attainment) to one that supports learning across the lifespan. Our best efforts should go to preparing students to make difficult judgments about their work and others work, to avoid relying too much on others opinions of them, and for decision making in the midst of change and uncertainty (Boud & Falchikov, 2006). "Graduates in the workforce will not in general be taking examinations or writing academic essays. They will be puzzling over what counts as good work and how they will be able to discern whether they are producing it" (p. 403). They suggested new criteria on which to assess students that prepare them to be lifelong learners, such as emphasizing the importance of context, and working with others, that could be built into undergraduate programs to help students (and their classroom faculty) see that learning is always situational, participatory, and contextualized.

The methodology used here could be modified to serve a formative or summative assessment function, as well as to serve an institutional program assessment goal. Following the recommendations of Zegwaard, Coll, and Hodges (2003), Boud and Falchikov, 2006, and Bullit (2006), students at various points in their undergraduate journey and graduates from different eras could be interviewed to discover how their stories of cooperative education learning are helping them to construct their lives. By listening for strategies—including meta-cognitive markers—and remaining open to or encouraging stories about 9-to-5 as well as 5-to-9 learning, co-op practitioners can map how their students learned, and what they learned. Audio taping and transcribing such interviews or focus groups could create an archive that could be mined to answer questions about curricular components. Todd, Zydney, and Keller (2011) offered an on-line communication tool to be used by students during cooperative education work experiences that is promising in that electronic communications do not have to be transcribed.

The study's goals will be met if readers consider co-op learning to be part of a life-long process of self invention and re-invention, if learning in addition to that which tracks closely to major-related classroom learning is embraced and assessed, and if a small point of light shines into that black box of co-op learning that we have been struggling to open and reveal.

ACKNOWLEDGEMENTS

This research was supported by research awards from the Pierson Lovelace Foundation, Cooperative Education and Internship Association, Midwest Cooperative Education and Internship Association, Cooperative Education Division of the American Society for Engineering Education, National Association of Student Employment Administrators, and the Antioch College Faculty Fund. Thank you to the graduates who participated, Richard Meisler, Jane Ferguson, Katie Egart, Bob Devine, Nina Myatt, Scott Sanders, Charlene Templeman, Jonah Liebert, and Rachel Fischer. Thank you to Pat Rowe for comments on an earlier draft.

REFERENCES

- Bandura, A. (1986). Self-efficacy. In A. Bandura. *Social foundations of thought and action: A social cognitive theory* (pp. 390-453). Englewood Cliffs, NJ: Prentice-Hall.
- Bartkus, K. R. (2007). A review and synthesis of scholarly research in cooperative education and internships: Part I An analysis of quantitative research published outside the journal of cooperative education and internships. *Journal of Cooperative Education and Internships*, 41(1), 56-96.

- Baxter Magolda, M. B. (Ed). (2000, Summer). Teaching to promote intellectual and personal maturity incorporating students' worldviews and identities into the learning process. *New Directions for Teaching and Learning*, 82. San Francisco, CA: Jossey Bass.
- Billett, S. (2006). Relational interdependence between social and individual agency in work and working life. *Mind, Culture and Activity*, 13, 53-69.
- Blustein, D. L. (1992). Applying current theory and research in career exploration to practice. *Career Development Quarterly*, 41, 174-184.
- Blustein, D. L. (1997). A content-rich perspective of career exploration across the life roles. *Career Development Quarterly*, 45, 260-274.
- Boud, D. (2000). Sustainable assessment: Rethinking assessment for the learning society, *Studies in Continuing Education*, 22, 151-167.
- Boud, D., & Falchikov, N. (2006). Aligning assessment with long-term learning. *Assessment and Evaluation in Higher Education*, 31, 399-413.
- Cates, C., & Jones, P. (1999). *Learning outcomes: The educational value of cooperative education*. Columbia, MD: Cooperative Education Association.
- Clark, A. (2008). *Supersizing the mind: Embodiment, action, and cognitive extension*. New York, NY: Oxford University Press.
- 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, 1-13
- Coll, R. K., Eames, C., Paku, L., Lay, M., Hodges, D., Bhat, R...Martin, A. (2009). An exploration of the pedagogies employed to integrate knowledge in work-integrated learning. *Journal of Cooperative Education and Internships*, 43, 14-35.
- Constas, M. A. (1992). Qualitative analysis as a public event: The documentation of category development procedures. *American Educational Research Journal*, 29, 253-266.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage.
- Del Corso, J., & Rehfuss, M. C. (2011). The role of narrative in career construction theory. *Journal of Vocational Behavior*, 79, 334-339.
- 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, 153-169
- Eppler, M. J., & Mengis, J. (2004). The concept of information overload: A review of literature from organizational science, accounting, marketing, MIS, and related disciplines. *The Information Society*, 20, 325-344.
- Fletcher, J. (1990). Self-esteem and cooperative education: A theoretical framework. *Journal of Cooperative Education*, 26, 41-55.
- Gardner, P., & Bartkus, K. R. (2014). What's in a name? A reference guide to work-education experiences. *Asia-Pacific Journal of Cooperative Education*, 15, 37-54
- Gendlin, E., T. (1995). Crossing and dipping: Some terms for approaching the interface between natural understanding and logical formulation. *Mind and Machines*, 5, 547-560.
- Glaser, B. (1978). *Theoretical sensitivity: Advances in the methodology of grounded theory*. Mill Valley, CA: The Sociology Press.
- Glaser, B., & Strauss, A. (1967). *The Discovery of grounded theory: Strategies for qualitative research*. New York, NY: Aldine de Gruyter.
- Goleman, D. (2005). *Emotional intelligence*. New York, NY: Bantam.
- Gray, D. E. (2007). Facilitating management learning: Developing critical reflection through reflective tools. *Management Learning*, 38, 495-517.
- Henderson, A. D., & Hall, D. (1946). *Antioch College*. New York, NY: Harper Brothers.
- Kelle, U. (2005). "Emerge" vs. "force" the empirical data? A crucial problem of "grounded theory" reconsidered. *Qualitative Social Research*, 6(2), Article 27.
- Kolb, D. A., (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.
- Laird, T. (2005). College students' experiences with diversity and their effects on academic self-confidence, social agency, and disposition toward critical thinking. *Research in Higher Education*, 46, 365-387.
- Lave, J., & Wenger, E. (1991). *Situated learning. Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.

- Lent, R. W. (2011). Career-life preparedness: Revisiting career planning and adjustment in the new workplace. *The Career Development Quarterly*, 61, 2-14.
- Linn, P. L., Meisler, R., & Burns, J. (1998, February). *Process of cooperative education learning: Three vantage points*. Panel presented at the annual Conference on Industry and Education Collaboration,
- Linn, P. L. (2004). Theories about learning and development in cooperative education and internships. In P. L. Linn, A. Howard, & E. Miller (Eds.) *Handbook for research in cooperative education and internships* (pp. 11-28). Mahwah, NJ: Lawrence Erlbaum.
- Linn, P. L., & Ferguson, J. (1999). A lifespan study of cooperative education graduates: Quantitative aspects. *Journal of Cooperative Education*, 34, 30-41.
- Linn, P. L., Ferguson, J., & Egart, K. (2004). Career exploration via cooperative education and lifespan occupational choice. *Journal of Vocational Behavior*, 65, 30-447.
- NVivo 10 [computer software]. Doncaster, Victoria, Australia: QSR International.
- Perry, W. G., Jr. (1981). Cognitive and ethical growth: The making of meaning. In A. W. Chickering & Associates (Ed.), *The Modern American College* (pp. 76-116). San Francisco, CA: Jossey-Bass.
- Raelin, J. A., Bailey, M. B., Hamann, J., Pendleton, L. K., Raelin, J. D., Reisberg, R., & Whitman, D. (2011). The effect of cooperative education on change in self-efficacy among undergraduate students: Introducing work self-efficacy. *Journal of Cooperative Education and Internships*, 45, 17 – 35.
- Rambusch, J., & Ziemke, T. (2005). *The role of embodiment in situated learning*. Retrieved from csjarchive.cogsci.rpi.edu/proceedings/2005/docs/p1803.pdf
- Richards, L. (2005). *Handling qualitative data: A practical guide*. Thousand Oaks, CA: Sage.
- Ricks, F., Cutt, J., Banton, G., Loken, M., & Van Gyn, G. (1993). Reflections on the cooperative education literature. *Journal of Cooperative Education*, 29, 6-23.
- Santrock, J. (2012). *Lifespan development* (14th ed). New York, NY: McGraw-Hill.
- Savannah, G. A. Mezirow, J. (1990). How critical reflection triggers transformative learning. In J. Mezirow (Ed.) *Fostering critical reflection in adulthood: A guide to transformative and emancipatory learning* (pp. 1–20). San Francisco, CA: Jossey-Bass.
- Savickas, M. L., Nota, L., Rossier, J., Dauwalder, J. P., Duarte, M. E., Guichard, J...van Vianen, A. E. M. (2009). Life designing: A paradigm for career construction in the 21st century. *Journal of Vocational Behavior*, 75, 239-250.
- Sovilla, E. S., & Varty, J. W. (2004). Cooperative education in the USA, past and present: Some lessons learned. In R. K. Coll & C. Eames (Eds). *International handbook of cooperative education: An international perspective of the theory, research, and practice of work-integrated learning* (pp. 3-16). Boston, MA: World Association for Cooperative Education.
- Strauss, A. L., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed). Newbury Park, CA: Sage.
- Super, D. E. (1990). A life-span, life-space approach to career development. In D. Brown, L. Brooks, & Associates (Eds.), *Career choice and development* (pp. 197-261). San Francisco, CA: Jossey-Bass.
- Tener, R. K. (2004). Using theory in research I: Understanding the learning experience in structured internships in construction engineering. In P. L. Linn, A. Howard, & E. Miller (Eds.), *Handbook for research in cooperative education and internships* (pp. 315 - 336). Mahwah, NJ: Lawrence Erlbaum.
- Terman, L. M. (1959). *Genetic studies of genius: The gifted group at mid-life*. Stanford, CA: Stanford University Press.
- Todd, A. M., Zydney, J. M., & Keller, J. M. (2011). Developing an online learning community for engineering, cooperative-education students: A design-based research study. *Journal of Cooperative Education and Internships*, 45, 67-79.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wagner, R. K., (1987). Tacit knowledge in everyday intelligent behavior. *Journal of Personality and Social Psychology*, 52, 1236-1247.
- World Association for Cooperative Education. (2014-15). *The best of co-op: A guide to the leading colleges and employers*. Retrieved from: <http://www.waceinc.org/eGuides/eGuide2015/index.html>
- World Health Organization. (2015). *Global health observatory data repository: Life expectancy by country*. Retrieved from: <http://apps.who.int/gho/data/node.main.688?lang=en>
- Zegwaard, K., E. Coll, R. K., & Hodges, D. (2003). Assessment of workplace learning: A framework. *Asia-Pacific Journal of Cooperative Education*, 4, 10-18.



About the Journal

The Asia-Pacific Journal of Cooperative Education publishes peer-reviewed original research, topical issues, and best practice articles from throughout the world dealing with Cooperative Education (Co-op) and Work-Integrated Learning/Education (WIL).

In this Journal, Co-op/WIL is defined as an educational approach that uses relevant work-based projects that form an integrated and assessed part of an academic program of study (e.g., work placements, internships, practicum). These programs should have clear linkages with, or add to, the knowledge and skill base of the academic program. These programs can be described by a variety of names, such as cooperative and work-integrated education, work-based learning, workplace learning, professional training, industry-based learning, engaged industry learning, career and technical education, internships, experiential education, experiential learning, vocational education and training, fieldwork education, and service learning.

The Journal's main aim is to allow specialists working in these areas to disseminate their findings and share their knowledge for the benefit of institutions, co-op/WIL practitioners, and researchers. The Journal desires to encourage quality research and explorative critical discussion that will lead to the advancement of effective practices, development of further understanding of co-op/WIL, and promote further research.

Submitting Manuscripts

Before submitting a manuscript, please ensure that the 'instructions for authors' has been followed (www.apjce.org/instructions-for-authors). All manuscripts are to be submitted for blind review directly to the Editor-in-Chief (editor@apjce.org) by way of email attachment. All submissions of manuscripts must be in Microsoft Word format, with manuscript word counts between 3,000 and 5,000 words (excluding references).

All manuscripts, if deemed relevant to the Journal's audience, will be double-blind reviewed by two or more reviewers. Manuscripts submitted to the Journal with authors names included will have the authors' names removed by the Editor-in-Chief before being reviewed to ensure anonymity.

Typically, authors receive the reviewers' comments about 1.5 months after the submission of the manuscript. The Journal uses a constructive process for review and preparation of the manuscript, and encourages its reviewers to give supportive and extensive feedback on the requirements for improving the manuscript as well as guidance on how to make the amendments.

If the manuscript is deemed acceptable for publication, and reviewers' comments have been satisfactorily addressed, the manuscript is prepared for publication by the Copy Editor. The Copy Editor may correspond with the authors to check details, if required. Final publication is by discretion of the Editor-in-Chief. Final published form of the manuscript is via the Journal website (www.apjce.org), authors will be notified and sent a PDF copy of the final manuscript. There is no charge for publishing in APJCE and the Journal allows free open access for its readers.

Types of Manuscripts Sought by the Journal

Types of manuscripts the Journal accepts are primarily of two forms; *research reports* describing research into aspects of Cooperative Education and Work Integrated Learning/Education, and *topical discussion* articles that review relevant literature and give critical explorative discussion around a topical issue.

The Journal does also accept *best practice* papers but only if it present a unique or innovative practice of a Co-op/WIL program that is likely to be of interest to the broader Co-op/WIL community. The Journal also accepts a limited number of *Book Reviews* of relevant and recently published books.

Research reports should contain; an introduction that describes relevant literature and sets the context of the inquiry, a description and justification for the methodology employed, a description of the research findings-tabulated as appropriate, a discussion of the importance of the findings including their significance for practitioners, and a conclusion preferably incorporating suggestions for further research.

Topical discussion articles should contain a clear statement of the topic or issue under discussion, reference to relevant literature, critical discussion of the importance of the issues, and implications for other researchers and practitioners.



EDITORIAL BOARD

Editor-in-Chief

Dr. Karsten Zegwaard University of Waikato, New Zealand

Copy Editor

Yvonne Milbank Asia-Pacific Journal of Cooperative Education

Editorial Board Members

| | |
|------------------------------|---|
| Ms. Diana Ayling | Unitec, New Zealand |
| Mr. Matthew Campbell | Queensland Institute of Business and Technology, Australia |
| Dr. Sarojni Choy | Griffith University, Australia |
| Prof. Richard K. Coll | University of South Pacific, Fiji |
| Prof. Rick Cummings | Murdoch University, Australia |
| Prof. Leigh Deves | Charles Darwin University, Australia |
| Dr. Maureen Drysdale | University of Waterloo, Canada |
| Dr. Chris Eames | University of Waikato, New Zealand |
| Mrs. Sonia Ferns | Curtin University, Australia |
| Dr. Jenny Fleming | Auckland University of Technology, New Zealand |
| Dr. Phil Gardner | Michigan State University |
| Dr. Thomas Groenewald | University of South Africa, South Africa |
| Dr. Kathryn Hays | Massey University, New Zealand |
| Prof. Joy Higgs | Charles Sturt University, Australia |
| Ms. Katharine Hoskyn | Auckland University of Technology, New Zealand |
| Dr. Sharleen Howison | Otago Polytechnic, New Zealand |
| Dr. Denise Jackson | Edith Cowan University, Australia |
| Dr. Nancy Johnston | Simon Fraser University, Canada |
| Dr. Mark Lay | University of Waikato, New Zealand |
| Assoc. Prof. Andy Martin | Massey University, New Zealand |
| Ms. Susan McCurdy | University of Waikato, New Zealand |
| Dr. Norah McRae | University of Victoria, Canada |
| Dr. Keri Moore | Southern Cross University, Australia |
| Prof. Beverly Oliver | Deakin University, Australia |
| Assoc. Prof. Janice Orrell | Flinders University, Australia |
| Dr. Deborah Peach | Queensland University of Technology, Australia |
| Dr. David Skelton | Eastern Institute of Technology, New Zealand |
| Prof. Heather Smigiel | Flinders University, Australia |
| Dr. Calvin Smith | Brisbane Workplace Mediations, Australia |
| Prof. Neil Taylor | University of New England, Australia |
| Ms. Susanne Taylor | University of Johannesburg, South Africa |
| Assoc. Prof. Franziska Trede | Charles Sturt University, Australia |
| Ms. Genevieve Watson | University of Western Sydney, Australia |
| Prof. Neil I. Ward | University of Surrey, United Kingdom |
| Dr. Nick Wempe | Whitireia Community Polytechnic, New Zealand |
| Dr. Marius L. Wessels | Tshwane University of Technology, South Africa |
| Dr. Theresa Winchester-Seeto | Macquarie University, Australia |