Sociocultural views of learning: A useful way of looking at learning in cooperative education

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Abstract

In this paper we argue for the usefulness of sociocultural views of learning for explaining the learning that students achieve on work placements. Sociocultural views of learning, which focus on the situatedness of learning through participation in a context, provide an opportunity to view the learning of the classroom and the workplace as within distinct communities of practice. We provide an overview of sociocultural views of learning, and illustrate their value to understanding learning in cooperative education placements with some qualitative data from a longitudinal study, in which these views have been used to examine the learning of a cohort of cooperative education students in science and technology. Data from the students has indicated that their learning on placement can be viewed as socially and culturally-determined. Conclusions drawn from this study have implications for the potential for co-op practitioners to design better placement curricula and pedagogy, and enhance justification of their placement programme.

Keywords: cooperative education, learning, placements, qualitative, situated, sociocultural.

In recent years there has been a renewed focus amongst the cooperative education community on research and theorizing into student learning in the process of cooperative education (co-op). In part this has been driven by a philosophical need as educators seek to better understand that which we do (Linn, 2004; Ryan, Toohey, & Hughes, 1996; Stull, Crow, & Braunstein, 1997; Van Gyn & Grove-White, 2004; Van Gyn, Cutt, Loken, & Ricks, 1997; Wilson, 1989), and in part as a means to satisfy a need for co-op programs to be seen as legitimately academic in order to hold their place as academic programs, particularly at the tertiary level (Branton et al., 1990; Cutt & Loken, 1995: Heinemann, 1988). But perhaps the most important reason of all is to enable co-op educators to design curricula and employ teaching and learning strategies that maximize the learning opportunities of our students.

An understanding of learning is not a simple task. Learning is influenced by individual, social, cultural, historical and political factors, and its understanding is complicated in the co-op community by a lack of formal background amongst many co-op educators in contemporary learning ideas. Designing co-op curricula – what can be learnt – and employing appropriate pedagogies – ways of teaching and learning – becomes problematic. To compound the problem, learning in co-op occurs in two different worlds, the world of academia and the world of work (Van Gyn & Grove-White, 2004). Needless to say, this has made theorizing about learning in co-op difficult, and research interesting.

In the face of this complexity, a number of theoretical ideas have previously been presented to explain learning in cooperative education. These include the cognitive development ideas of Jean Piaget (Cates & Jones, 1999; Van Gyn, 1994); the experiential learning views of John Dewey (Heinemann & DeFalco, 1990; Jabs, Jabs, & Jabs, 1978; Saltmarsh, 1992) and David Kolb (Cates & Jones, 1999); reflective practice (Van Gyn, 1996); and the view that there are multiple intelligences (DeFalco, 1995; Williams, Sternberg, Rashotte, & Wagner, 1992). Each of these perspectives makes a contribution to our understanding of learning in co-op, and acknowledges the context in which the learning takes place. In general these perspectives see the student as an individual learning in a social context. This paper describes a different approach to thinking about learning in co-op which takes as its prime focus that contexts have social, cultural and historical dimensions, which can account for learning. These 'sociocultural' views of learning emphasize the importance of these contexts in student learning.

Sociocultural views of learning

Sociocultural views of learning propose a different understanding of the 'social' contribution to learning, which acknowledges the influences of earlier researchers such as Vygotsky and Piaget, and more recent contributors such as Lave, Wenger, and Rogoff (Salomon & Perkins, 1998). Vygotsky and Piaget saw each individual's mind as developing in a socially-mediated environment (Piaget, 1950; Vygotsky, 1978; Wertsch, 1991). In contrast,

Lave and Wenger (1991) described learning as occurring in social interactions rather than each individual's mind, and Rogoff saw learning as occurring through participation in activities (Rogoff, 1991, 1995). These sociocultural perspectives can be seen as learning as a 'situated activity' occurring through participation, learning as distributed cognition, and learning as mediated action. Each of these perspectives is now discussed.

The first of these ideas depicts learning as a situated activity within a community of practice (Lave, 1991; Lave & Wenger, 1991; Wenger, 1998). Lave (1991) defines situated learning as emphasizing "the inherently socially-negotiated quality of meaning and the interested, concerned character of the thought and action of persons engaged in activity" and "that learning, thinking, and knowing are relations among people engaged in activity *in, with, and arising from the socially and culturally structured world* [original emphasis]" (p. 67). That is, learning occurs within a social situation, cannot be dissociated from it, and can only be understood within the context in which it occurred. The emphasis on social negotiation of meaning indicates that it is through social interaction, in which participants share knowledge and understanding, that they come to understand what they do. In this view learning and thinking are viewed as social processes occurring in a community of practice, in which members participate in a shared endeavor.

Students on co-op placements may undergo a cognitive apprenticeship (Brown, Collins, & Duguid, 1989) through being situated alongside practising professionals and participating in authentic activities (Billett, 1994). This apprenticeship not only allows the learning of manual tasks in the traditional sense, but also inducts the student into ways of thinking and understanding in the community. This is seen to be more than just on-the-job training and a promising model in considering the education involved in the passage from novice to expert (Boshuizen, Bromme & Gruber, 2004: Field, 2004). In this way the students learn through their participation (Rogoff, 1995), gradually adopting the culture of the workplace in a process of enculturation (Brown et al., 1989; Hennessy, 1993). This may allow the students to develop an identity (Wenger, 1998) within their workplace community as they become socialized (Garavan & Murphy, 2001) into the ways of knowing, thinking as well as doing.

Howard and England-Kennedy (2001) have previously argued that a view of learning as being situated is helpful not only for when the student is in the workplace, but also in the classroom. They see the development of a learning community based on situated, contextualized learning as important within the preparation and evaluation phases of the co-op program. Situated learning ideas have recently been applied to theorizing (Linn, 2004) and research in science (Eames & Bell, 2005), nursing (Dartsch, Gatel & Lundh, 2004; Field, 2004), medical education (Prince & Boshuizen, 2004), engineering design (Etelapelto & Collin, 2004), and adult education (Fenwick, 2001). They may lead us to think of co-op students as learning how to use certain experimental methods in science, or learning how to relate to patients in a clinical setting, and how engineers learn about meeting the design needs of clients through design team meetings.

A second idea that underpins sociocultural views of learning is that cognition (e.g. learning) is distributed across a community of practice. The notion of distributed cognition suggests that learning is seen to involve more than just than the person, but the person-plus (Perkins, 1997), being the person plus the surround. In this way cognition (e.g. learning) is seen to be located outside individuals' heads, and jointly composed in a system of people and artifacts (Salomon, 1997). Therefore distributed cognition includes the 'surround' - the physical and social resources of the setting which serves as a 'vehicle for thought' and what is learned, which is situated both in the mind of learner and in the 'arrangement of the surround' (Perkins, 1997). A community of practice, such as a workplace, can then be conceived of as having learning distributed across its people and artifacts in a social world of activity within a cultural medium (Cole & Engestrom, 1997). The distribution of cognition and learning across a community is seen as being stretched over, rather than divided up amongst participants (Salomon, 1997).

In this view, co-op students gain access to this distributed cognition in their placements. Learning occurs as a joint activity involving the members of the workplace community and the artifacts within it such as tools, instruments, media, buildings and so on. The more access the student has to these socially and culturally-derived artifacts, the more potential for learning exists. For example, an accounting co-op student may learn from involvement with the company's filing system, observing how clients are treated, experiencing the way in which offices are arranged and being trained to use new software. Each of these learning opportunities may involve different members of the community but together constitute the practice that they share.

A third notion that contributes to sociocultural views of learning is that human action is mediated by tools and signs. This view draws on the work of Vygotsky (1978) and mediated action considers that human action such as learning is effected by tools and signs, which are themselves situated in the social

and cultural environment in which they exist (Wertsch, 1991). Wertsch, del Rio and Alvarez (1995) separated the mediational means into technical tools (such as instruments and computers) and psychological tools (such as language and counting systems). Two key ideas arise from consideration of the influence of mediational means. Firstly they are used in social interaction, particularly in the case of language. Secondly they are "products of sociocultural evolution, and are inherently situated in sociocultural context" (Wertsch, 1991, p. 91). This, Wertsch (1991) argued, locates higher mental functioning such as learning together with mediational means. Wertsch further asserted that one way of investigating sociocultural approaches to how the mind works is through exploring how social language mediates learning. He drew on Bakhtin's notion of social languages – discourses peculiar to specific communities – to explain how language could lead to learning in a particular community of practice. There is seen to be continuity between language and thought, each informing the other, such that thinking, and learning, are socioculturally determined (Leach & Scott, 2003).

As language is used in the workplace, this approach would appear to hold promise in understanding how students learn in their co-op work placements. Consider a media arts co-op student who is exposed to the jargon used on the production set of the TV news. Additionally, all students in co-op placements are likely to be required to use some form of instrument or other tool that could affect their learning, in a similar vein to distributed cognition. A trainee teacher on placement may learn the value of storybooks through reading to her class. The notion that learning occurs through mediated action in social situations therefore has relevance to co-op placements.

From a sociocultural viewpoint, learning occurs through participation in two distinct communities of practice, that of the educational institution and that of the workplace. In the work placement, learning is mediated through the use of tools and language and is distributed across the community in all directions. Learning is situated in the context of the workplace and is assessed as increasing participation within its community.

Having argued for this view of learning on placement, it would be only fair and reasonable to consider (albeit briefly here) the sociocultural view of learning in the educational institution. This permits a view of learning in the classroom that engages the social dimension through a transactional process in which the educator provides opportunities for discourse through collaborative work and other such pedagogies that lead to classroom communities and the unique social relationships that characterize them (Lemke, 2001). It also leads to a system in education in which different cultures are recognized for their differing learning needs and diversity is genuinely emphasized. It openly acknowledges the sociocultural dimension of the educational institution, the power relationships, the privileging of knowledge, and the gate-keeping roles of assessment. In this way sociocultural views of learning ally themselves equally with a transformational approach to learning that seeks to empower students to bring about change, as Van Gyn and Grove-White (2004) allude to in their recent very useful description of learning orientations.

This deliberation on sociocultural theory may be heavy-going but is necessary to develop the underpinnings that cooperative education needs. We recommend the reader pursues the reference list for a fuller (and perhaps clearer) discussion of these concepts. We attempt now to illustrate the utility of these concepts in examining learning in co-op with examples from a study conducted into learning perceptions of a cohort of students as they passed through their co-op degrees at the University of Waikato, New Zealand (Eames, 2003). The material presented here focuses on the placement components of the co-op program.

Context of the study

A co-op program, the BSc(Tech), has been offered at the University of Waikato in science and technology since 1974 (Coll, 1996). This program places around 180 students per year, and has been shown to be operationally successful (i.e., 100% of graduates looking for permanent work secured positions within six months of graduating (Meech, 1997). The BSc(Tech) program is a four-year degree in contrast with the non-co-op three-year BSc degree also offered at the University. Essentially the degree consists of a BSc with the addition of two management papers and a total of 12 months relevant paid work experience. This work experience comprises two work placements, one of three months duration at the end of the second year, and the other of nine months duration at the end of the third year (Coll, 1996). The goals of the placement program include providing students with a genuine employment experience in science and technology by placing them in a productive role relevant to their career interests. It is intended that students may be able to learn what it is like to work in science and technology by working in a science and technology community of practice.

Methodology of study

This study employed an interpretive, qualitative methodology in which the learning perceptions of the students were interpreted through the lens of sociocultural views of learning; namely, distributed cognition, situated learning, and mediated action.. The interpretive approach to research acknowledges the researcher's own subjectivity allowing us to draw on our own experiences as co-op practitioners. The choice of an interpretive, qualitative study facilitated a deep understanding of the students' experiences, allowing rich descriptions contextualized within their individual placements to be obtained through probing questions (Cohen, Manion and Morrison, 2000; Coll, 2000; Lincoln & Guba, 1985; Patton, 1990; Shulman, 1997). It was a longitudinal study that explored the learning outcomes and processes of students as they progressed through their co-op degrees. This allowed for a study of student development over time (Arzi, 1988; Keeves, 1998; Sprod, 1997). Semi-structured, one-on-one interviews were used for data collection. The semi-structured interview with a set of topic questions permitted gathering some across-case data but still allowed flexibility in the conversation, and for open dialogue with each individual student about the key issues of interest. Content analysis that examined the statements that students made was carried out using a coding system according to categories of commonality that emerged from the data.

The cohort was recruited from second year students in the BSc(Technology) program. Participation was invited in such a way that a balance was attempted across gender, across subject majors[1] in proportion to the total population, and across a range of industry sectors.

A group of 22 students agreed to participate in the study, 12 males and 10 females. Each participant was interviewed on at least four occasions as specified in Table 1 below.

Table 1. Schedule of Interviews

Interview 1	Before beginning first placement, at end of second year of study
Interview 2	Towards the end of the first placement in the workplace
Interview 3	After first placement, before second placement, while in the third year of study
Interview 4	During second and final placement in the workplace

[1] Biology majors were excluded from the study to avoid a conflict of interest, as the principal researcher acted as examiner for these students in their co-op placements

This paper provides data from the interviews undertaken. All interviews were audiotaped and transcribed verbatim and participants were given the opportunity to validate their transcripts. Pseudonyms have been used in presenting the data. Excerpts provided here have been edited lightly for sense (e.g., removal of repeated words, wrong tense). The interviews investigated the learning experiences of the students in their science and technology workplaces, and the integration of these experiences with their learning at university. Extracts from this study are now considered using sociocultural views of learning.

Sociocultural views of learning on placement

When a sociocultural lens was turned upon the learning experiences of the co-op students in their science and technology work placements, notions of learning emerged that emphasized the importance of social mediation and participation within a community of practice.

Students in this study recognized a setting in their placements that was different from the university setting in time, space, social relations, motivation to learn and the value of tasks. For example, while at university, students are responsible for organizing their own time, although the timetable of classes does provide some constraints (laboratory classes, but not lectures or tutorials, are compulsory). Students found, however, that they could get free time between lectures and laboratory classes, and even during those classes for the less diligent. However, once at work the need to be at work for an eight-hour day was hard for some. Amongst the participant cohort were students who had little previous work experience, and in some cases no full-time paid employment. One of these students, Duncan, made this observation about his experience of the work community:

> Yeah it's different to what I thought. I found it real tiring for the first while. Like when I was at Uni I thought a job would be awesome, because I would have the nights free, no homework. But at the end of the day at work, I'm pretty stuffed.

Other students noted the need to adjust to the daily routine of work, and the loss of long holidays over the summer. On the other hand students found the lack of homework very positive. In particular they talked about the difference in learning between the workplace and the university. Their experience was that learning occurred at work, that what was learnt at work was used immediately, in order to accomplish a task at hand; whereas the students felt they achieved more university learning when studying at home, that learning was asynchronous (in

that it would only be used later in a test or in a workplace), and that they found it hard to relate to a particular context. As Sally noted about the workplace "you are actually learning real stuff, stuff that is used, and you are learning it because you can see how it is used, it's a live thing, whereas at university you sit down and you are told things". The students felt motivated to learn in their placements in order to impress their employers and fit into their workplaces, rather than to satisfy assessment requirements as they perceived their learning at university.

Learning as a social process

In the workplace setting, students reported learning through means that can be interpreted as social mediation. As Salomon and Perkins (1998) note, one of the simplest forms of social mediation of individual learning is instruction or training. The students in this study reported being told or shown what to do by their workmates. The trainer was either their work supervisor or one of their fellow technical staff. Nigel endorsed the way he was trained:

> The way they trained me was very good, the one person training me, and then they just eased me on to the job very slowly and it gave me a lot of confidence and I understood the job well, which is all I really ask at that stage.

Nigel's role in the placement was to analyze samples from a manufacturing line on a particular scientific instrument. He commented on how his trainer and other workmates helped him solve problems with the instrument, until his own experience with the instrument allowed him to solve them himself. His comment about understanding the job can be interpreted as his gaining more than just the technical skill required to do the task. Nigel could be viewed as undergoing a cognitive apprenticeship (Brown et al., 1989), in which he was able to appropriate the skills and understanding shared within the community of his workplace, leading to his enculturation (Hennessy, 1993) into ways of working in that workplace.

What emerged from the students' perceptions of their experiences was a picture of newcomer (student) dependence on 'old-timer' (co-worker) for sharing of knowledge about the practice of working in their environment (Lave & Wenger, 1991). In another example of this sharing of knowledge Grant commented on how important his workmates were to him learning his job:

> Well some individuals were responsible for me learning everything because … I was given a couple of notes, you know, just with the basics on what to do and some of the employees there just showed me how to implement them and a couple of tricks to get a job done properly.

Grant's mention of 'tricks to get a job done properly' points to an in-house sharing of knowledge that is specific to that community of workers. This knowledge, distributed amongst the workplace community, was evidently not something that was written down in the instruction notes that he mentioned earlier in the statement. Grant commented that the notes just gave the 'basics' and he learnt the 'finer details' from the workmates. This example further illustrates that much of what is known and practiced in a community such as a workplace is not written, but shared amongst the community in a process of guided participation (Rogoff, 1995).

A third example of social mediation comes from Joe's experiences in research science on placement. He learnt about ways to solve the research problems he was encountering through hearing historical stories in his placement:

> The anecdotal stories that your supervisors give you about what they've done in the past, and the problems that they've encountered and that sort of thing, it helps you to sort of flesh out your idea of the research process and the way people do things.

Joe perceived that this sharing of knowledge by the 'old-timers' about their practice in science was important in his learning of what it means to research. The use of the term 'flesh out' indicates a development process of coming to understand the way research is done. He noted that working alongside his workmates and supervisors helped "enormously" to contribute to his knowledge and ability. This process can be interpreted as an apprenticeship into science research (Lave & Wenger, 1991).

The students also noted that the social learning process can be used in negative ways. In Grant's second placement he experienced how knowledge can be withheld from new staff members, privileging the old-timers with power over the newcomers. In Sally's forestry placement she felt excluded from certain tasks because, as she perceived through comments made in her hearing, she was a female and therefore not tough enough for those roles. A third example relates to Jill's first placement where she experienced how rumors about a lack of work could be unsettling to the workforce.

Learning as a situated activity

The students in this study reported learning both practical skills, and technical knowledge in their placements. Martin's second placement was working on a research project on ceramics in a research institution. He described how although he had attended lectures on ceramics in his courses at university, he felt he had gained only a limited understanding and consequently held little interest about the material. However his placement changed his view:

> I learnt a lot about ceramics and their uses, by talking to a lot of the other researchers there and finding out what areas they were researching, and the applications they used them for, and yeah it was really interesting to find out the wide range of products which can be made from ceramics.

Being situated alongside ceramics researchers in his placement had given Martin the opportunity to learn more about the knowledge and applications of the material. The experience had altered Martin's view through seeing and hearing about what could be done with the material. Participating in working with ceramics, talking to his workmates and learning about their work generated more interest for him and led him to believe that he was a lot more "comfortable" with ceramics after his placement.

Two examples further serve to illustrate the socially-situated nature of learning in a co-op work placement. Firstly, Joe was employed as a research assistant in both his placements, which gave him legitimate access to work alongside science researchers and become involved in the process of their work, albeit as a peripheral participant (Lave & Wenger, 1991). Through being given tasks to do, and his involvement in the science research community, he was able to identify some key learning outcomes. These outcomes included gaining an understanding of how to research, and how to practice science. Joe commented about his first placement that "it has certainly broadened my horizons of scientific research and has given me a good perspective of how science works in the workplace, and also how it's practiced and individual styles". Through his placements in a research science community, Joe began to discern that the community that he was on the periphery of was not homogeneous and that there were different ways to practice scientific research. Joe explained his comment on different styles as "I'm thinking about the approaches that different people take towards research, and the way in which they set it out and go about it, which does vary from person to person". By working alongside science researchers Joe had been able to observe and participate in a variety of scientific research approaches from which he could develop his understanding of the research process. Joe commented that his placements had "helped to stoke the fires of interest and enthusiasm within me for chemistry, and I will enter this year with a much clearer perception of chemistry in action in the workplace". This immersion into a research community of practice that utilizes different approaches could not easily be simulated at the undergraduate level at university, and this experience in the placement could contribute to a clearer perception for a student of what it means to research in science.

In the second example, Rick worked for a world-renowned electronics company and he reported being immediately impressed, and a little daunted, by the presence of many prestigious awards on the walls in the entrance hall. This led Rick to perceive that his workplace was highly professional, but after a time working in the research and development section he became confused through his observations of a habit of his workmates. He described:

> A lot of the time people just sit back at their desk, close their eyes and think about what they are going to deal with. And then they'll do it, so, obviously if you walked into an office with three or four people sitting away from their desks with their eyes closed you would immediately think, you know [no one is working here] but...I find myself doing it, it's quite a catching habit because you sort of learn to think about what you are going to do before you go and do it.

Rogoff (1995) has described the concept of participatory appropriation as individuals changing through involvement in an activity, and therefore becoming prepared for involvement in related activities. Rick's appropriation of this 'habit' from his workplace community was not something that he had been instructed to do. He had observed the practice, rationalized its meaning and come to participate in its use. Rogoff (1995) is careful to distinguish appropriation from acquisition, with the former being contextualized within the meaning of activity, as in Rick's behavioral change in response to the 'culture' of the community of practice in his placement.

Viewing learning as a situated activity acknowledges the possibility of students learning bad habits of even illegal activities from their workmates. In this study, only one student reported being

exposed to poor workplace practice as the company he worked for went into receivership. He experienced a lack of professionalism amongst the staff, and the co-op educator responsible for the placement spent a lot of time helping Craig to interpret what had happened.

Learning as distributed cognition

In this study, the students provided examples of how cognition (knowing, understanding, thinking, learning) can be distributed through a community. They described how knowledge was shared amongst the community members and passed on to newcomers. As Nancy noted in her first placement:

> It was just passing on their knowledge to me, something that you can't really look up in a book, you have to experience it. Because they've had the experience in the lab of working with extractions and things like that, which is stuff that I hadn't done before.

In her work in a chemistry laboratory Nancy felt that she had learned that knowledge of how to do the work was distributed amongst her workmates. Through participating in that workplace in a productive and meaningful way, she was able to share in that knowledge and experience.

Vanessa and Rick described how knowledge was shared across the community to create the practice that they were all engaged in. As Vanessa observed in a science research placement:

> I have learnt that everyone in the organization has their own individual talent, skill or piece of knowledge on an aspect of science which no-one else may have. Therefore everyone becomes an important and key component of the organization.

One view of this comment is that knowledge and understanding is distributed within the community that contributes to the overall understanding of the community's endeavor. This example shows that it is possible for a student on placement to learn about the roles that members of a research community undertake and how the organization fits together. Rick worked in a research and development group within a manufacturing company and he also commented about how people work together towards a common goal:

> I think it's rewarding when you see, you just sort of see all your work coming together with everyone else's, how they seem to form a good product. I think that's how people know, is when their work fits perfectly with everyone else's. Sort of like an intricate jigsaw puzzle, everyone's building separate pieces. You might not know while you are building the jigsaw puzzle whether you are building it properly but as soon as you put it all together it's plain to see.

Rick felt that he had gained an understanding of the research and development process through being a part of a team of people working together to form a product. His analogy of workmates working on pieces of a jigsaw indicates a belief about interdependence that may only be understood by being immersed in the situation.

These examples hint at learning through distributed cognition. The students also described their learning to use instruments and computer systems within their workplaces that gave them an understanding of what their placement community was trying to achieve. In this way students on placements may be seen to learn through their engagement in the knowledge and understanding distributed across their placement communities.

Learning as mediated action

Social mediation of learning was also seen to occur through cultural scaffolding using artifacts such as tools and information sources (Salomon & Perkins, 1998). One such tool is language, which is constituted in the social context in which it is found and shaped by the culture in which it has evolved (Simon, Dippo, & Schenke, 1991; Vygotsky, 1978; Wertsch et al., 1995). Many of the students in this study reported encountering a 'new' language of work in their placements. This language consisted mainly of technical terms, abbreviations and acronyms. Nigel's experience was typical:

> Abbreviations are a big thing in those sorts of companies, laboratory abbreviations for a start, the machine they use and the test they do, but there is also a lot of jargon on the production line in the brewing process, it's all a different language to start with, so the first few weeks there was a bit to learn.

For students in this study, language elements such as jargon, abbreviations and acronyms formed an important part of their learning in the workplace. Tasks and objects are defined by the language used to describe and discuss them. In many cases learning this new 'language' was critical to the students'

understanding of their work and their ability to carry out tasks.

The students also made mention of learning what Wertsch (1991) had noted as social languages – language peculiar to a particular community. The students reported feelings of confusion, frustration and alienation when they encountered this new language, but found that they gradually became 'enculturated' into its use and came to adopt it. Initially, however, this new language this caused problems for some students, as Grant experienced:

> Very frustrated. Because I got the feeling that some of the workers look down on me, you know, might have thought that I wasn't too sharp because I didn't understand what they were saying.

Grant's perception was that the 'language barrier' had led to his alienation from his workmates. He commented that he was given little formal training at the beginning of this placement and it can be assumed that explanations of in-house language were not included. It is possible that workers could even withhold information about language from newcomers in order to retain some power or superiority over them.

The understanding of this workplace-specific terminology involved the students in learning a new 'language' that reflected the culture of the organization's enterprise. This language would have developed historically within the social environment of the company, or its wider industry, and had become a part of the everyday speech of work. In fact, as Nancy discovered, members of that language community can use the terms without realizing that others may not understand them, and without consciously relating the term to its origin. She related an incident in which she came across an abbreviation that was new to her and asked a workmate what it meant and "they said 'oh that's right you might not know' but then when they thought about it, they had been using it for so long they had almost forgotten themselves".

The students commented that they learnt the language of the community in a variety of ways. Nigel noted that he didn't get 'taught' it, that he learnt the language through experience when "people talk to me and watching other people talk". Karl and Jeff said they just asked every time some new term came up and that learning the language of the workplace was not difficult, whereas James commented "that they gave me books to read, oh you know, company manuals and stuff like that, to read just to get used to the language".

These examples illustrate the significance of language in mediating learning in work placements. In this way, language can be clearly conceived of as a tool used by a particular community of practice. This tool allows knowledge and understanding to be distributed across the community (Pea, 1997) and acts to delineate the cultural borders of the enterprise of that community (Cole, 1991).

Implications for curriculum design and pedagogy

This interpretation of students' placement experiences from a sociocultural perspective has implications for curriculum design and selection of pedagogy. Seeing learning as socially-situated, distributed and mediated means that as educators we can plan for what could be learnt and select teaching and learning strategies that account for this. Several implications for cooperative education practice emerge:

1. Firstly co-op can be viewed as a valuable and legitimate learning strategy. Co-op placements allow entry of students into a community of practice, in which learning enables the transition from student to practitioner. The placement plays an important role in allowing the student to understand what it means to practice in their subject area. This is more than on-the-job training, and involves cognitive functions typical of education.
2. Seeing the placement from a sociocultural perspective necessitates a re-consideration of the preparation of co-op students for entry into the workplace. This preparation may involve discussion of: the role of work ethics and routines; the development of working relationships; and the importance of the development of personal skills. It should also involve discussion of learning as an activity mediated through social interactions, participation and the use of tools (such as language) and artifacts such as instrumentation, communication devices, or even coffee machines.
3. Prior to their placements, students should be encouraged to acknowledge and understand their own sociocultural histories, including their experiences in, and their identities within, other communities of practice. Taking this approach would allow the students to understand better their career focus, and their knowledge and skills which they may wish to complement through enculturation into a new community of practice. It may also permit clear acknowledgement of learning objectives

within the placement, and for links to be made between learning in the placement community and their own sociocultural histories, a linkage negotiated in terms of the relatedness of the sociocultural settings experienced (Murphy & Ivinson, 2003).

4. The curriculum of the placement is defined by the situated, distributed and mediated nature of the learning that can be achieved. Access to experienced community members, the old-timers, the social language and the artifacts of the community will determine the learning outcomes. The purpose of the placement becomes enculturation into the placement community of practice, which the student can then understand in the context of their previous sociocultural histories, including their academic studies. Assessment of student achievement on placement focuses on the process of enculturation and the student's understanding of the workplace community of practice.
5. The need for the co-op educator to facilitate the student's co-op education becomes evident. Students interpret their prior experiences within their sociocultural histories and thereby plan to complement and extend their histories through the work placements. Individual learning plans could be constructed to facilitate this. The educator must also understand the sociocultural setting of particular workplaces, including the type of work conducted, the workplace staff (in particular the work supervisor) and the norms of behavior in that community. The educator then plays a key role in matching the student to an appropriate workplace. Naturally, there are often constraints that prevent a perfect match of student to workplace, and in these, and all, placements, the co-op educator can work with the student to assist them to establish links between their sociocultural histories and the new placement community. For example, the co-op educator may need to address the concerns of students with little previous work experience prior to their first placement, discuss the different theoretical approaches used in the academic setting and the workplace, or assist the student in interpreting social relationships in the workplace. It also emphasizes the importance of site visits to the student on placement to assist the student to understand their learning through relationships, language and artifacts, and to help the student to make links between their learning in the academic and workplace communities. This sociocultural learning role for a co-op educator has not been argued before in the co-op literature, and adoption of such a stance may necessitate specific training for these educators to undertake the role.

Conclusion

When a sociocultural lens has been focused upon co-op as in this study, then an image has emerged of a learner who enters a new community of practice. This learner, a co-op student, can be seen to be an individual who participates in many different communities (the academic setting, the workplace, the home, the peer group, the sports team or church group), and within each community the student constructs an identity that contributes to their own sociocultural history. That history is a result of the sum of the student's experiences and enculturation into the ways of thinking and behaving in each community.

Each student then carries that history into the co-op placement, creating a link between their history and that of the workplace community. Through their participation in this new placement community, they come to socially share in the cognitive and physical processes inherent within it. They gain legitimate access to the tools and artifacts that define that community, and learn to become a community member. In doing so, they are transformed in both an individual way (based on their sociocultural history) and a sociocultural way. This process leads to a view of the community of practice that is individualized, but also interconnected through its members.

In this manner, a student's learning through co-op can be theorized. Prior to entering the work placement, this student has been enculturated into thinking about their studies through legitimate access to the social sharing of knowledge through attending classes, discussions with teachers and peers, reading texts, practical experiences and so on. This enculturation has provided ways of thinking about certain phenomena, and some methods of analyzing and researching those phenomena. The student, at this pre-placement stage, has constructed an identity as a student, who understands their development as a member of the academic community through the process of summative assessment, and their success in the community is measured mainly by attainment of qualifications.

This student carries their particular academic community history, as well as their history of participation in other communities, into the co-op

placement. The co-op program allows the student to move between the communities, crossing the border between sub-cultures of practice (Aikenhead, 1996). Within the placement community of practice, the student encounters new knowledge, new ways of thinking and behaving that are constituted in the sociocultural history of that community. The student learns as they come to share, through legitimate participation in socially mediated interactions, in the thinking and behaving of the community, through its members, their tools and artifacts. This student fits these new experiences into their unique sociocultural history, gradually developing their own meaning about the practice of their discipline. The development of the student as a member of the workplace community of practice is viewed as increasing participation within the community, and their success in the community is measured by transition into a practitioner.

We have argued in this paper that sociocultural views of learning are useful in conceiving of learning in cooperative education. We would not argue that they are the only way of conceiving that learning, but rather provides a perspective that complements experience and reflection. Utilizing these sociocultural views of learning has enabled a view of the co-op placement as a learning environment, which is distinct from, but complementary to, the educational institution. Learning is seen to occur through enculturation into each community and its ways of thinking and behaving. The student gains a deep understanding through their engagement in the community of their identity within it. The transition from student to practitioner occurs as the student assimilates their construction of a workplace identity into their own sociocultural history.

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