Cooperative Education: Supporting and guiding ongoing development

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This paper seeks to further our understanding of the processes of learning arising from students’ experiences in both education and workplace settings and proposes implications for cooperative education. It emphasises the significance of individuals’ experiencing cooperative education across both workplaces and educational institutions. Using case studies of individuals’ learning throughout working life and school students’ engagement in reflecting on paid work, the interdependence between the personal and social contributions of this learning is elaborated. These examples illustrate how workplaces and educational institutions afford opportunities for participation and learning, and how individuals elect to engage with what is afforded them in and across these settings. Therefore, it is necessary to account for the imperatives of both settings (i.e. their intentions and enactments) in seeking to integrate contributions of educational institutions and workplaces, and how individuals’ personal histories or ontogenies shape what they experience, engage with and learn. Without accounting for how individuals engage with what is afforded them in cooperative education programs, the goals of these programs for securing rich learning may remain unfulfilled.

1. Supporting and guiding ontogenetic development

A central concern for cooperative education is to integrate learning experiences within educational institutions with those accessed in settings outside of them (e.g. workplaces), to develop robust learning that is applicable in those kinds of settings. As such, this purpose is central to an implicit goal of education: to assist individuals to be effective in their lives outside of and beyond educational programs and institutions. Cooperative education is distinct in seeking to utilise the contributions of both kinds of settings (i.e. educational institutions and workplaces) and not privileging the former over the latter. This is despite many of its advocates and practitioners working within educational institutions. In this way, cooperative education gives much attention to how best to integrate and build upon the distinct experiences provided in both settings; including attempts to co-ordinate and manage experiences across both settings. All this is worthy educational work that reflects concerns about maximising the contributions of each of these settings.

The argument advanced here is that learning through engagement with the social settings, such as educational institutions and workplaces, comprises a duality between the affordances (i.e. contributions) of these settings and learners’ engagement with them. Yet, without understanding and accounting for how individuals engage with what is afforded them, concepts of curriculum, educational provisions and pedagogy for cooperative education will remain incomplete. In seeking to integrate the contributions to learning of educational institution and workplace settings, it is necessary to account for the particular imperatives of both of these settings (i.e. their intentions and enactments), and also how individuals make sense of these experiences, engage with and learn through them. This case is elaborated using studies of learning through work and school students’ learning about working life through reflecting on their paid part-time work experiences. However, firstly, after a consideration of curriculum and cooperative education, the conceptual base of development across the life course (i.e. ontogenetic development—a dualistic process) is briefly described. The case of learning through work is presented to illustrate this premise for understanding learning. Then, in consideration of integrating these experiences in workplaces and educational settings a case study of students’ reflections on their paid part-time work is presented. While both address issues of affordances and engagement in learning, the second offers a way of thinking about integrating workplace experiences into the curriculum within educational institutions. Finally, some implications for cooperative education are advanced.

Cooperative education

Cooperative education continues a tradition of considering curriculum, educational provisions and pedagogy in terms of place or setting. It acknowledges the particular contributions of different kinds of settings and, importantly, places learners in a central role (e.g. Furco 1996). Other traditions tend to privilege what experiences are offered by educational institutions. Curriculum, in this tradition, is often seen as something that is ‘intended’ and ‘enacted’ in educational settings. Hence, the curriculum is seen as the kind of experiences provided to students and learners for and by the school (Marsh & Willis, 1995). Many curriculum and regulatory frameworks similarly focus on the content and provisions in educational institutions (e.g. the capacities of teachers). The experiences of learners occurring in educational institutions are usually authorised and legitimated, by the existence of a written syllabus, trained teachers and institutional apparatus of the education provision. However, such perspectives place less emphasis on the ‘experienced curriculum’: what sense students make of what is ‘intended’ and subsequently ‘enacted’. Yet, curriculum can only really be valued in terms of what learners construe and learn from it. Similarly, pedagogic practices are usually considered in terms of teaching qualities, instructional strategies or design and the like. When personal contributions are considered, it is usually in terms of learning style or preference and their fit within the intended or enacted instructional strategies. Less often is the idea of personal epistemological practices given priority or acknowledgement of the key role of individuals’ active learning processes in conceptions of curriculum and pedagogy: i.e. making meaning, construing and constructing knowledge from what they experience.
The point here is that conceptions and considerations of curriculum tend to privilege settings that afford experiences for learners and, in doing so, render secondary individuals and their important, necessary and inevitable contribution to the process of learning. This is particularly salient for cooperative education, because students will need to negotiate meaning within and across two distinct kinds of settings. Of course, the contributions of educational institutions and workplace settings are important and, in many ways, indispensable. In individuals’ learning of vocational practice, they provide important contributions through the experiences and guidance, and the potential to access the particular knowledge that can be accessed within them. Yet, a curriculum that focuses primarily upon those settings fails to furnish a complete account of that learning or even the potential of educational institutions and practices. This is because individuals’ learning is an active and possibly idiosyncratic process of knowledge construction (Billett 2006). Even social theorists are cautious about claims that the contributions of social settings themselves can be understood without considering the individuals who engage with them. For instance, Berger and Luckman (1966) state that even for those willingly engaging with the social suggestion (i.e. the projection of social practices and norms), there will be variations in how they conceive that suggestion. These variations are the product of personal histories, subjectivities, agency and the complex of personal factors that mediate individuals’ learning. Humans are distinct in possessing capacities for reflective self-evaluation (Taylor, 2006) and exercise of reflexivity (McLaren, 1997) that free us from many forms of subjugation. Valsiner (1994) and Bhaskar (1998) both acknowledge the ubiquity of social influence, yet also emphasise the relational qualities of personal (e.g. interests and goals) and social imperatives that shapes individuals’ construction of knowledge. Indeed, Valsiner (1998) proposes that “most of human development takes place through active ignoring and neutralisation of most of the social suggestions to which the person is subjected in everyday life” (p. 393). This is essential to buffer individuals from the demands of the social suggestions that they continually experience. He continues,

Hence, what is usually viewed as socialisation efforts (by social institutions or parents) is necessarily counteracted by the active recipients of such efforts who can neutralise or ignore a large number of such episodes, aside from single particularly dramatic ones. (p. 393)

All educational provisions, including co-operative education, can offer individuals is an invitation to change. Yet, there can be no certainty that invitation will be accepted, or accepted in the way that the intended and enacted curriculum proposes. Hence, conceptions of cooperative education need to account for the affordances – invitational qualities of education institutions and workplaces to those participating in them to change, and the relational bases of how individuals elect to engage with what is afforded them. This is not to suggest or impose a highly individualised phenomenological perspective that denies contributions of these socially-derived settings. Instead, it acknowledges the dual, yet relational, contributions of place and the personal, yet gives emphasis to the role that individuals play in negotiating with the social and brute world in their learning in and through cooperative education.

2. Ongoing development as lifelong learning
The idea that individuals’ development is shaped by an ongoing process of negotiation between the personal and the social is far from new. Baldwin (1894) identified individuals as being selective and discriminating in how they make sense of what they experienced. Piaget’s (1968) developmental theories elaborated this active construction of knowledge through the processes of accommodation and assimilation in which individuals construct new learning and new categories of knowledge and, respectively, then reinforce and refine what they have learnt through later experiences. These processes are not reserved for planned and enacted educational experiences, they occur as part of every day thinking and acting. According to cognitive theories, individuals’ everyday and ongoing sense-making are directed agentically to secure equilibrium (Piaget, 1968) or viability from what they encounter (von Glasersfeld, 1987). Individuals are held to be constantly engaged in monitoring what they experience and seek to understand novel experience as well as reinforcing what they know through subsequent experiences. So individuals are making sense of their experiences, both agentically and through what they have previously experienced. Valsiner and van der Veer’s (2000) concept of premeditate experiences – those that come earlier and from which they have learnt – stands as being more than prior knowledge. These experiences are fundamental to how we, as humans, construe, construct and engage in the process of making sense of what we encounter in our lived world.

Social constructivists also emphasise this ongoing process of making sense and learning, through participating in socially-derived activities and interactions. Scribner (1985) and Rogoff (1990) refer to the process of on-going moment-by-moment learning or microgenetic development that occurs as individuals engage in everyday conscious thinking and acting. This ongoing process of thinking, acting, and learning occurs inter-psychologically (e.g. Vygotsky) through interaction between what the social circumstances afford and how the individual comes to construe and construct that affordance premised on their existing ‘cognitive experience’ (Valsiner, 2000). Moreover, the evidence suggests that individuals construct their own versions of what they experience and this is shaped by negotiations between the immediate circumstances and individuals cognitive experiences (Billett, 2003). Through these interactions, individuals’ cognitive experience is engaged, remade and possibly transformed, leading to particular personal ways of making sense of the world. Hence, the personal construal and what shapes it, plays an important role in individuals’ cognition and learning. Central here are the focus and intensity of individuals’ engagement and learning (Billett, Smith, & Barker, 2005). For instance, Goodnow (1990) notes that individuals not only solve problems (i.e. learn) but also
decide what problems are worth solving. So, the same activity or interaction in the education or workplace setting may elicit quite different responses from individuals depending upon their backgrounds, interests or what the circumstance offers to them.

All this suggests that individuals’ participation in educational arrangements and them taking up the invitation to change may be premised as much on their personal agency, concepts and ways of engaging with the world, as on what settings afford them. Therefore, provisions of cooperative education need to account for the premises through which individuals engage in learning through these experiences. To illustrate and elaborate these conceptions, the next section discusses a case study of learning through work.

3. Case Study One – workplace learning

From studies of workers’ learning through and for work across a range of industry sectors, a set of factors contributing to how individuals learn everyday work activities has been identified (Billett 2001). Key contributions to this learning include: (i) individuals’ engagement in goal-directed activities within the workplace; (ii) direct guidance they receive from other workers; and (iii) indirect guidance they secure from participating in work and interacting with others and the workplace. The potency of each of these contributions is premised on the affordances of the workplace and individuals’ engagements in those activities (see Table 1). This table depicts the relational bases of these contributions through a consideration of how these contributions are afforded and engaged. Firstly, how individuals are invited to engage in particular kinds of activities and interactions and are either supported in or inhibited from participating in those activities, does much to shape their access to work-related knowledge. Yet, in addition and conversely, how individuals elect to engage in workplace activities, the focus of their intentional engagement and the degree of effort they deploy in undertaking these tasks will also have particular legacies in terms of what they learn through their participation in work activities (Billett et al 2005). So, the particular interests and imperatives of both the workplace and individual workers will, in different ways and by different degrees, shape the learning that arises through participation in everyday activities at work.

The second of these contributions – direct guidance - is very much premised on the willingness and competence of others to afford guidance to less experienced workers. However, there is again the factor of how individuals elect to engage with the guidance being afforded them. This includes how individuals engage with the more expert or experienced coworker, which is influenced by the learners’ perceptions of the more experienced partner’s competence. In one study (Billett & Hayes, 2000), a worker refused to engage with his workplace-appointed mentor, claiming that he knew more about his work practices than his mentor. Consistently, this worker then reported through a series of interviews and responses to critical incidents, that his learning in the workplace was largely a product of his own agency, not of his mentor’s support. Regardless of the truth of this worker’s assertion, the point is that even when direct work guidance is afforded individuals will make judgements about the pertinence, credibility and utility of that guidance and also about the consequences for their sense of self in such engagements. Rightly or wrongly, they may either accept or reject that guidance on the basis of their appraisal of its worth. So, as with teaching, individuals play a significant role in engaging with and mediating direct guidance.

Table 1 – affordances and engagement in work-related learning

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<thead>
<tr>
<th>Source</th>
<th>Affordances</th>
<th>Engagement</th>
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<tr>
<td>Everyday activities</td>
<td>participate in activities from which knowledge required for work performance can be learnt; access the social and physical contributions from which the performance for work requirements are accessible; and direct guidance that can provide access to knowledge that would not be learnt by discovery alone.</td>
<td>how individuals exercise their intentions, agency and construals when engaging:</td>
</tr>
<tr>
<td>Indirect guidance</td>
<td></td>
<td>in activities they can access in the workplace; with the social and physical environment of the workplace; and with more experienced counterparts</td>
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The third of these key contributions – indirect guidance – is premised on the individuals’ engagement with the physical and social contributions of the workplace. This includes observing and listening, utilising models, clues and cues about work, performances that are accessible in the workplace and in different ways for particular workers. These performances are not always objective or equally accessible. Individuals may or may not be able to engage in the workplace discourse, and will utilise in different ways what is observable within the workplace, given differences in their understandings of what they are observing. Many anthropological accounts of learning emphasise learning cultural practices, such as work, arising through individuals’ active mediation and learning of what they encounter and experience, rather than how these practices are being taught (Lave, 1993; Pelissier, 1991; Rogoff & Lave, 1984). So much of what shapes the efficacy of workplace learning experiences is a product of individuals’ engagement, negotiation with and construction of what they experience in workplaces.

It follows that, in different ways, individuals will elect to exercise their agency in securing this knowledge. Certainly, some individuals’ engagement in work-related learning will be inhibited because of their standing and status. For example, volunteer fire fighters were given no access to some of the expertise and practices employed by
professional fire fighters in learning how to fight fires in remote and rural communities (Lloyd, 2004). However, on becoming employed as paid fire fighters, they were invited to learn these practices (Lloyd, 2004). Similarly, the agency of workplace participants can drive interest in securing knowledge which is beyond their current employment status (Billett, 2001). Understanding workplace goals often requires access to the knowledge and the assistance of more experienced workers to access that knowledge. Yet, it is the agency of individuals in thinking about, seeking out and formulating understanding of the goals that is central to their need to understand to what purposes their labour is directed. Consequently, individuals’ attempts to overcome the limitations of segmented work practices, contested workplaces and understand knowledge which is not accessible, requires them to be agentic. This suggests the importance of personal epistemologies – how individuals go about learning agentically: actively and pro-actively.

If the requirements for being more agentic in learning through work seem an unreasonable burden, it is worthwhile considering experiences of how relatively socially-isolated workers learn. A study of how small business operators learnt to implement the goods and services tax (GST) in Australia (Billett, Ehrich, & Hernon-Tinning, 2003), found that agency and intentionality of these operators was important not only in how they decided to engage in the task of learning (e.g. with whom they would collaborate, often very selectively), but also in making decisions about what they believed was important for them to learn. So both the goals for learning how to implement this new practice and the processes of doing so, were largely shaped by the small-business operators’ interests and intentionality. For instance, those in professional practice (e.g. optometrists, veterinarians) elected to engage in learning only about the scope and extent of their compliance requirements. They were more interested in their professional practice and were able to delegate this task to somebody else. However, other kinds of small business operators had specific goals and needs for understanding this taxation regime. These included avoiding dependence upon accountants and financial advisers or careful planning of entrepreneurial activities. All this rehearses the importance of how individuals elect to engage in work-related learning experiences.

Although the focus of the analysis above has been on workplace experiences, it is possible to develop a similar list for learners’ participating in educational institutions. For instance, it might be argued that much of the intentional goal-directed activities are directed towards the imperatives of schools as educational institutions, rather than students’ learning and how these are afforded and how students elect to engage with them. The proposition advanced here is the key role that individuals play in their learning and how the bases of their agency and intentionality will be exercised in that learning. The focus of this intentionality in terms of its engagement, direction and strength is central to the process and outcomes that comprises individuals’ learning experiences. This is not to deny the important contributions of others in the workplace or the educational institution, nor is it to encourage wholly individual over collective learning efforts. Instead, it suggests a greater consideration in cooperative education for personal epistemologies and educational provisions that explicitly acknowledge and accommodate the place of the individual within these arrangements and the experienced curriculum as being the key consideration for both the ‘intended’ and the ‘enacted’ curricula.

4. Integration of experiences in workplace and educational institutions

As noted, key imperatives for cooperative education are finding ways to integrate the contributions to students’ learning within education institutions with those of other settings. Therefore, and building upon the premises outlined in the previous sections, it is worthwhile considering how that integration might best occur. In this way, there is a concern for curriculum and pedagogic practices to be focused on guiding and enriching the experiences of learners across these settings.

It seems likely that it will be those within educational institutions and systems (e.g. teachers) who will lead and guide this process of integrating the contributions of the experiences within workplace and educational institutions. This is because much of the wherewithal, interest and imperative for effective integration of these experiences resides within educational institutions. Also, on balance, given the key role for supporting learning, and concerns about the applicability of what is learnt in educational institutions to workplace settings, it is perhaps in the educational institutions’ interest to lead the integration of the two sets of experiences. For instance, the educational goal might be to understand the broad applicability of a particular set of vocational practice (e.g. nursing, hairdressing, automotive work) to a range of possible workplace practices (i.e. different wards, salons, garages). If this was the case, it would be necessary to understand something of the diversity of practice requirements across a range of such practices in order to develop and apply the kinds of knowledge able to effectively address the requirements for effective practice across distinct instances of work practice. It follows then that developing these understandings could be undertaken by sharing among students their experiences of the requirements of the different kinds of workplaces in which they have worked or have been seconded to. In Australia, for instance, apprentices spend approximately 85% of their indenture in the workplace and 15% of their time in technical colleges. Hence, a useful pedagogy practice would be to use some college time to engage apprentices in discussing work performance requirements in their particular workplaces and then use this as a basis for sharing and critiquing these experiences.

In particular, drawing out canonical principles and practice which apply across particular kinds of work regardless of setting might be helpful. Classroom activities within the educational institution could then be used to share apprentices’ experiences of how servicing of vehicles, procedures for hairdressing, approaches for preparing and serving food etc are enacted in particular workplaces. These then could be drawn out and reflected upon by learners to understand the particular circumstances and requirements for those kinds of work performance. This then can be used to assist apprentices and students to understand the relationship between different kinds of performance conditions and performance requirements, and understand something of a variation of these for their own vocation. Similarly, trainee
nurses’ experiences of different kinds of hospital wards could be drawn together to identify what constitutes the canonical principles and practices of nursing and they may be asked to reflect on how these might be applicable to different kinds of nursing work in which they might find themselves engaged.

The possibilities and problems with achieving this kind of process and its educational outcomes are discussed in the case study below. This case study draws on a study of school students’ reflecting on their paid part-time employment as a means for critically appraising their work, working life and pathways beyond school.

5. Case Study Two – School students’ learning through reflecting on their paid work
This second study resulted from a concern that school students’ school-organised work placements lacked authenticity, were too short in duration, and weakly engaged these students, thereby denying opportunities to understand the world of work. Yet it was known that up to 70% of Australian senior year students are engaged in authentic work activities in their paid part-time work (Department of Education Training and Employment, 2000; Fullarton, 1999). In 2003, 79% of 15-19 year olds in Australia studying on a full-time basis were employed part-time (Australian Bureau of Statistics (ABS), 2004). Therefore, these experiences represent an educational resource to understand work, work life and post-school pathways that is readily available in every Australian high school. The aim here was to integrate the students’ workplace experiences using school-based activities. The project involved working with groups of year 11 and 12 students (16 and 17 year olds) in five Australian schools to assist them understand the world of work and value its contributions to their education and to inform their post-school pathways and post-school transitions.

The procedures adopted for this project drew on students’ experience of the paid part-time work to secure important educational goals about school-to-work transitions by reflecting critically and constructively on those experiences. All of these goals are consonant with the goals of cooperative education (Van Gyn, 1996). The process of engaging the students to secure these goals comprised them reflecting and sharing their work life experiences through a series of four sessions. In these sessions, they considered the work activities using a set of descriptors about work and work practice; shared these with other students; considered the implications for post-school pathways and reflected further on the process. However, securing these goals was not straightforward in the school settings. Firstly, although it was anticipated that some school students might struggle to engage positively and constructively in reflecting upon their paid part-time work experiences, this problem was exacerbated by some of the teachers’ value positions and pedagogy practices. Whereas some teachers were able to engage students in useful discussions, and intervene to draw out helpful insights (e.g. about working with others, learning through work), this was not always the case. Moreover, some teachers lacked sympathy for, and competence with, a process which legitimated learning experiences outside of school. Furthermore, some seemed uncomfortable with pedagogic processes in which students were the sources of knowledge to be shared and reflected upon. Of course, not all students were cooperative or benign. So, the sentiments of the teachers in accepting knowledge from elsewhere, and being able to effectively integrate these experiences, were central to this project.

Findings relevant here include: (i) students’ understanding the world of work; (ii) what students learnt through reflecting upon work; (iii) the educational value of reflecting upon paid work; and (iv) the role of institutional practices and teachers in integrating these experiences.

Firstly, pressing students to reflect upon that paid part-time work, overall, permitted them to identify crucial features of work and working life. This included them making distinctions between the conditions, status and roles of part-time and full-time workers, differences in the kinds of rewards for, and the kinds of, work that are undertaken by different categories of workers (e.g. those with higher or lower levels of qualifications and skills); differences in the kinds of discretion available to different categories of workers; distinctions in prospects for advancement and career progression across categories of workers; and differences in the kinds of requirements for workplace performance expected across workplaces (Billett 2007). It seemed that through describing their experiences of paid work, the students were able to identify and critically appraise many of the features of their paid work and working life. These insights were developed over time through periods of engagement in work that were significantly longer than those available through short work placements.

Secondly, the majority of students agreed that their paid part-time work provided an effective experience to learn about the world of work and consider post-school options. The students’ responses to what they had learnt through reflecting on their paid work included: learning about working life; learning about different kinds of work and what was common and different among them; learning about preferred kinds of work; considerations about whether their preferred work options were actually what they wanted to do. In addition, it assisted in developing an awareness that the students need to understand what actually constitutes the work that they were aiming to pursue careers in before they invested significant time and finance in tertiary and higher education courses that would prepare them for their intended occupations. Often, but not always, the students’ responses demonstrated insights about approaches to work and post-school options. In all, the students were able to identify the educational worth of reflecting upon their paid part-time work experiences, even if that appreciation was not always explicit.

Thirdly, the students reported that this process was helpful and appreciated most when students were able to debate and discuss these matters rather than writing their ideas down. Certainly, feedback from the teacher suggested that discussions were often rich, informed and engaging, and the task of writing down their insights did not always reflect this richness. So, this suggests that the method for engaging the students in reflecting upon their paid part-time work might need to be considered in terms of the kinds of outcomes that are desired by the teacher. Certainly, some
struggled to articulate their ideas positively in writing. Yet, despite this, even those who resented writing about their paid part-time experiences did, nevertheless, seemed to gain from the opportunity to reflect upon their work.

Finally, an important finding was that, beyond the readiness and characteristics of the students, teachers’ interest in the workplace content and their capacities to provide effective classroom-based experiences stood as important determinants in students’ reflections upon their paid part-time work experiences. Standing out among teachers’ qualities were those associated with: (i) their capacity to adapt and utilise effectively processes that met the readiness and characteristics of students; (ii) their capacity to facilitate student learning by drawing upon their learning rather than teaching them; (iii) managing students’ reflection of their paid work; and (iv) appreciating the likely contribution of the workplace experiences for students. Overall, it seemed that the degree to which the experiences of paid work were able to be maximised and addressed constructively in the classroom, was identified as being, in part, a product of the understanding of working life by teachers and their capacity to facilitate this process in the classroom. In some ways, alarmingly, there was evidence of the closed culture of schooling which seem to de-value the contributions and sources outside of the school, which in turn inhibited the quality of school-based engagements.

This second case is presented as an instance where experiences across two different kinds of settings by students are utilised to potentially enrich student learning in ways consonant with the goals of cooperative education. Curiously, one of the best outcomes in this project was from a school that had a very limited tradition of vocational education. The quality of the outcomes of this school were realised through engaged and agentic students and the effective management of their learning experiences by their teacher.

6. Implications for cooperative education

In sum, it is proposed that the contributions of workplaces and educational institutions to student learning have particular strengths and weaknesses the potential of which is mediated by the degree by which they are afforded and by how individuals elect to engage with these affordances. So, one consideration is to draw upon and integrate both sets of contributions in ways which meet particular educational purposes. However, it is important to emphasise the mediating role that individuals (i.e. students, teachers) play in realising the full potential of such integrative efforts. This was evident in the second case study. Much of what is advanced here is consistent with and, perhaps, offers nothing particularly new to cooperative education. Indeed, to its credit, the cooperative education movement has long valued the contribution of students’ experiences in both workplace and education settings and has been concerned to integrate the two. Moreover, the emphasis on the students’ perspective has always been strong. Nevertheless, it has been proposed that consideration of curriculum needs to be on the experienced curriculum and a consideration of the kinds of experiences that are provided for and made sense of by students. It reminds us about the central role of the personal in the learning process. This leads to the task for teachers to find out how best to engage and extend the experiences of students in classroom settings. Also, in considering the integration of learning experiences, the educational purpose (e.g. specific knowledge development, general learning outcomes) importantly needs bring to the forefront those efforts to provide and integrate those experiences. Each of these kinds of goals will have particular processes that are most likely to achieve their purposes. Moreover, the concept of pedagogy employed in cooperative education needs to include personal epistemologies, the agency and intentions of learners, and the kinds of pedagogic practices that can best engage, exercise and extend the learners’ conceptions. The suggestion here is that efforts to integrate particular kinds of learning experiences will need to account for their diverse contributions, and how individuals make sense of and integrate these contributions.

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