

Theorising the relationship between the individual, knowledge and skill

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Abstract

This paper critiques the recent emphasis in the post-compulsory education and training literature on the contextual, situated and problem-oriented nature of knowledge creation and learning. It argues that this is problematic on two grounds: first, in the way it understands how knowledge is created and used; and second, in the way it conceptualises the relationship between the individual, skill and the work-place. I use social realism to argue that the knowledge we need to use does not just arise from the context of our practice on the one hand, and on the other, in taking the fact of our embodiment seriously, I argue that learning needs to go beyond learning in the work-place or learning for work.

Introduction

This paper critiques the dominant VET paradigm of competency-based-training on the one hand, and on the other, constructivist alternatives championed by many opponents of CBT. I argue that while there are important differences between them, and each occupies different positions within the VET field, that there are important commonalities between them. Both emphasise the contextual, situated and problem-oriented nature of knowledge creation and learning, with the consequence that a convergence around a new pedagogy is emerging, which draws “on constructivist theory and practice as its main source of understanding” (Cullen *et al* 2002: 11) even if the philosophical position underpinning each is different.

While many competency-based training theorists may not agree with constructivist philosophy (particularly if they are philosophically consistent), they may still happily agree with constructivist theorists that learning needs to be contextualised and situated. The basis of their agreement goes beyond a pragmatic political agreement that learning should be in ‘authentic’ sites, which is usually the work-place (even if this is for different reasons). Both are united because they focus on the level of *actions* in emphasising the contextual, specific and immediate nature of learning and knowledge creation, even though they draw different conclusions from this. I argue in this paper that they are both deficient because they need to go beyond the level of actions to consider the underlying generative mechanisms that underpin both learning and knowledge creation. I use social realism to argue that the knowledge we need to use does not just arise from the context of our practice on the one hand, and on the other, to argue that learning needs to go beyond learning in the work-place or learning for work if we are to take the fact of our embodiment seriously. The pedagogical and policy implications are that we must distinguish between the learning needs of individuals and the enterprises for which they work (or are destined to work).

This paper first discusses the arguments in support of knowledge and learning as contextualised, situated and problem-oriented. This is followed by a realist counter-argument, which insists that knowledge cannot be reduced to the conditions of its production, even though it bears the marks of its production process, in particular the marks of power and exclusion. It also insists that knowledge can exist independently of knowing subjects, but if it is to be *learnt and used and changed* then the learner must embody it, which arguably, is a precondition for expert performance (and which thereby renders as too simplistic the division of learning into propositional and procedural outcomes). This requires a process whereby the learner constructs knowledge in personally meaningful ways, while not acceding to the relativist principles of much constructivist theory of knowledge and the social world. The

paper argues that the process of embodiment is a *relational* one, which emerges from the interplay between the individual and their material, social and cultural environment.

Contextualised, situated & problem-oriented

Two key approaches are used to argue that knowledge creation and learning are contextualised, situated and problem-oriented. The first argues that the conditions of knowledge production have changed, and that this has implications for processes of learning, for what is learnt, and where learning should take place. The emphasis in this argument is on the *discontinuity* between old and new methods of knowledge production driven by the change from an industrial economy based on a well-defined division of labour and Fordist principles of production, to a knowledge economy characterised by change and permeability of all boundaries (in social life, in the economy, in knowledge, in social and cultural structures and beliefs, and in personal identity) (Young, 2003).

In the tertiary education literature, this approach has been made most famous by Michael Gibbons in his distinction between Mode 1 and Mode 2 knowledge. Mode 1 knowledge is disciplinary based, often 'pure' research, conducted in universities by disciplinary specialists within a hierarchical framework that specifies the rules for knowledge creation, what counts as knowledge and who can contribute to it. Mode 2 on the other hand, is categorised by "a distinct set of cognitive and social practices" suitable for cross-disciplinary, problem oriented, applied and less hierarchical research that occurs at the site of application, and which is, as a consequence, "more socially accountable and reflexive" than is Mode 1 knowledge (Gibbons, 1997: 3). It does not privilege the university as the sole site of knowledge creation.

The implications of the Mode 2 analysis are that we need a new pedagogy and curriculum to reflect these changes. Young (2003) explains that for such theorists, it is inconceivable that the curriculum should remain immune from these changes in how knowledge is produced in the knowledge economy. Muller (2000) explains that some argue that a Mode 2 curriculum needs to supersede a Mode 1 curriculum, while it seems that fewer argue that the two should be kept in creative tension (which is Muller's and Young's position). Cullen *et al* (2002: 11) say that "the most important feature of the 'new pedagogy' is the altered configuration of the whole educational research enterprise." The emphasis on propositional knowledge in the curriculum is giving way to the contextualised, contingent and immediately applicable. It also includes moving learning out of formal education and training institutions and emphasising informal learning and tacit knowledge as prime sources of competitive advantage (Field, 2002).

The second approach draws from relativism and argues that knowledge creation has always been situated and contextualised, and so too has learning. While there are many fundamental differences between them (and they would be aghast to be placed in the same group), these arguments derive from humanist, radical, and post-modernist theorists who have long argued that the division between academic and vocational education is primarily a mechanism to entrench privilege and power, and to sanction elite ways of knowing over those who are locked out of academe. Arguments about the way in which power is implicated in knowledge creation have merit as far as they go. However, some relativists go to extremes, arguing that there is no conception of society that is independent of what agents take it to be, and consequently that there are many different conceptions of society reflecting the different standpoints of different agents, none of which is more 'true' than another (Usher, 1996). In this account, learning propositional knowledge seems pointless, unless it is to 'discursively deconstruct' it (and then who is to say that that is a correct 'reading'?). This is because, ultimately, strong relativists deny the possibility of, and basis for, knowledge that is not

grounded in experience and identified with a socially situated knowing subject (Young, 2000).

Philosophically, many of these arguments try to overcome the Cartesian dualist mind/body problem, which is derived from the methodological individualist proposition that the *individual* (or more precisely, the individual *mind*) is the source of knowledge, and that knowledge is a property of individuals. This casts the mind as an “inner sensorium”, locked up in the body (Toulmin, 1999). The ‘mind’ does not directly engage with the world, because it has no direct relation with the world, this being mediated by the senses. Cartesian dualism distinguishes between direct, bodily engagement with the world (and consequently cannot account for bodily ways of knowing) and cognitive consideration of information mediated by the senses. It ignores not only the different ways we know (with our bodies holistically), but also the social and cultural practices that give rise to knowledge, and the relationship between how we know and the socially mediated processes of knowledge creation (Toulmin, 1999).

However, as I will argue, in rejecting the Cartesian dualist notion of the mind/body and the atomistic and individualistic properties of knowledge, it is not necessary to embrace relativistic notions of knowledge that deny the reality (or relevance) of propositional knowledge and focus only on the situated and contextual. Both forms of knowledge are needed, and both emerge from practice and in the process are transformed. My position therefore has some similarities with constructivism, but only the weaker forms which accept the concept dependence (and hence fallibility) of all our knowledge, while rejecting judgemental relativity, arguing that there are grounds for judging some theories superior to others, because they can explain the independent reality (which includes social reality) they seek to describe more ‘adequately’ than competing theories (Sayer, 2000).

A realist view of knowledge¹

Critical realism makes claims about the nature of reality in distinguishing between the real world and our knowledge of it, arguing that what exists (including society and social structures) does not depend on what we think about it or know about it. In insisting on the existence of a social world that exists independently of our knowledge of it, critical realists admit that we have insights into the social world because the conception of agents “are not external to the facts described but make up part at least of the reality of those facts” (Outhwaite, 1998: 283). However, our knowledge of those facts does not exhaust all there is to know. While the natural and social world exists independently of our conceptions of them, our knowledge of both is fallible and provisional because our experience of the world is always theory-laden (though not theory *determined*) (Sayer, 1992). Bhaskar (1998a: x) explains that critical realism is premised on “a clear concept of the continued independent *reality* of being...” and “the *relativity* of our *knowledge*”

Sayer (1992: 67) explains that admitting the fallibility of our knowledge is not “a threatening statement, because paradoxically, the common experience of making empirical errors, of mistaking the nature of the world, supports rather than undermines realism. For it is precisely because the world does not yield to just any kind of expectation that we believe it exists independently of us and is not simply a figment of our imagination. If there were no cases of our statements being confounded, if wishful thinking worked, there would be no reason for being a realist, and we could say that truth was purely relative to our conceptual scheme.”

¹ There are different kinds of realist theories, and Michael Young classifies his as social realism. I have drawn on his approach and also on critical realism, which is not necessarily consistent with Young’s views in all things.

Sayer (2000: 41-42) further explains that whilst realists could agree with the relativist view that “What counts as truth is intersubjectively agreed upon” that nonetheless, “the matter does not end there, for, as the realist will quickly add, the conventions are not *arbitrary*, since not just any convention will work as a basis for (intersubjective) action and expectations.” This means that while knowledge is socially produced and subject to intersubjective agreement about its validity, that knowledge cannot be reduced to the conditions of its production (Young, 2003). Knowledge refers to *something* and consequently cannot be arbitrary. In other words, knowledge is not just about the community of knowledge producers who elaborated it.

A realist view of knowledge and the process of constructing knowledge acknowledge that both are mediated by power, vested interests and privilege, and that the knowledge so produced bears the marks of its production process. This is because all knowledge creation is a socially mediated process. However, it also yields information about the world and greater (if imperfect and always incomplete) understanding about what exists (Young, 2003), and the results that ensue as a consequence of the emergence of necessary and contingent relations between different objects, and different orders of objects in open systems.

What is it that this knowledge is about? Critical realists argue that the world is complex and stratified. Critical realism is a *relational* philosophy because it examines the *interplay* between different objects and strata, arguing “that the world is characterised by emergence, that is situations in which the conjunction of two or more features or aspects gives rise to new phenomena, which have properties which are irreducible to those of their constituents, even though the latter are necessary for their existence” (Sayer, 2000: 12). For example, while they are intrinsically related, individuals, groups and society are three different kinds of ‘objects’ with different properties, none of which are reducible to the other. While groups and societies would not exist unless individuals existed and both emerge from social relations between agents, it is not possible to add up all the individuals in society or a group to arrive at either. Individuals have capacities that organisations or groups do not have and vice-a-versa. Individuals have capacities for cognition, perception and consciousness, whereas groups can have a flat or hierarchical organisational structure, and a society can have an old or young demographic structure, can be more or less class differentiated and so on (Archer, 1995). The process of *emergence* describes what happens when different kinds of objects or strata interact.

This applies to the natural world as well as the social, but in making this statement realists do not therefore think that the methods of the natural sciences can be unproblematically applied to the social sciences. This is because the nature of the object that we are investigating determines what we can know about it, and the process we use for finding out (that is, the practices we use). For example, Bhaskar (1998b: 206) says that:

“...it is the nature of objects that determines their cognitive possibilities for us; that, in nature, it is humanity that is contingent and knowledge, so to speak, accidental. Thus it is because sticks and stones are solid that they can be picked up and thrown, not because they can be picked up and thrown that they are solid (though that they can be handled in this sort of way may be a contingently necessary condition for our *knowledge* of their solidity).”

Archer (2000) explains that it is the properties of water and the way our body interacts with it that allows us to learn to swim. The properties of the object we seek to understand determine the methods we can use to explore them, and this is why it is not possible to have a universal method to account for objects that do not have universal properties.

Because the natural and social worlds are fundamentally different, different methods of investigation must be used. Archer (1998: 190) explains that “Critical realism accepts the challenge of ontological difference between physical and social reality....” and “is *not* advocating the unity of method *if* this is taken to be synonymous with a ‘unity of

methodology' in the positivist tradition. The latter can be crudely represented as 'Observation + Correlation = Explanation + Prediction. This traduces both natural and social reality as well as the differences between them.'

Rather, critical realism argues that what is needed in both the natural and social sciences is to identify the *underlying causal mechanisms* (which may or may not be observable) that give rise to events in the world (the level of actions, whether or not we can observe them), and our experience of them (the empirical, observable dimension). To argue that investigation should be restricted to the level of actions, or even worse, to empirically observable events, is to collapse the question of what exists into a question of what we can know or experience (Sayer, 2000). The world is a complex, open system characterised by the constant interplay of different kinds of causal mechanisms (for example, social class and gender in the social world). This is fundamentally a *relational* philosophy in contradiction to positivist philosophy and methodology that aims to discern the constant conjunctions of events, and on this basis make predictions about the future. The latter cannot explain the relations between events, nor can it distinguish between the accidental and the necessary (Archer, 1995). Moreover, it cannot explain why things do *not* happen, for example, why there have been no Black presidents in the United States (Archer, 1995).

Sayer (1992: 155) explains that positivism is derived from a philosophy of atomism, which has two branches: "The ontological branch – concerning the theory of what exists – holds that the world consists of discrete, distinct atomistic elements existing at discrete, distinct points in time of space. Being atomistic these basic elements have no internal structure or differentiation and no causal powers. The various objects that we know are nothing but different combinations of these atoms. All relations between objects are external and contingent, so that all sequences are accidental. These assumptions are matched by the epistemological branch – concerning the theory of knowledge – which depicts observation as fragmented into simple, unproblematic, indivisible 'readings'. These two branches are mutually reinforcing: if objects or events are 'punctiform' their observation as such is also more plausible and vice versa."

This explains the approach underpinning competency-based training. It is anchored in atomism, in which skills can be broken down into discrete components, packaged as competencies, then added up, moved about, and reconfigured to make different qualifications, through common core competencies (and now generic skills). That is, the total equals the sum of the parts, and different sums (comprising many of the same elements) make different totals. This is the method that *aggregates*, and is less concerned with understanding the *relationship* between elements, and how these elements are transformed in the context of such a relationship. In emphasising observable performance (the level of actions) it ignores the *underlying causal mechanisms* that are relational and not reducible, and which are needed to generate (a varying and contextually sensitive) performance in a variety of contexts. In focussing on outcomes it assumes that those outcomes can be achieved by directly teaching the outcomes, usually in the site where the outcomes must be demonstrated (the work-place). It ignores the complexity that is needed to create *capacity*, and this goes beyond the level of actions in the contextual and situated.

Constructivists focus on the level of actions, but for different reasons. They are not guilty of atomism in the same way that positivism is (except perhaps, when considering the natural world, see Danermark *et al.* 2002). In focussing on the construction of meaning that is situated and intersubjective, strong constructivists reduce all that is important to the intersubjective, and this tends to exclude the importance of (and reality of) propositional knowledge. To insist on the externality and reality of the propositional register of society's knowledge, is to be guilty, according to relativists, of reification (the crime of regarding something abstract as a material entity). The emphasis instead is placed on *process* and tacit

knowledge and skill, and the way in which the social construction of both authorises a performance in one instance as skilled, and in another as unskilled (and does not address the question of whether or not the performance *really is skilled*). The focus becomes the way in which meaning is constructed, and truth defined intersubjectively in ways that exclude and include.

The problem with this analysis is that it only accounts for *part* of the context it seeks to describe, because it focuses on a discourse that is internal to itself, and devoid of external referents (which draw on propositional knowledge and embodied skill and includes the activity system or community of practice). It focuses on the community of producers and how they *understand* what they are doing, and not on their actual practice – or *what* they are doing. *Both* aspects need to be analysed if the nature of practice is to be understood. Strong constructivists emphasise the immediate and the moment and the interplay between agents, and not on the underlying mechanisms, which (as realists agree wholeheartedly) include discourse and power relations, but which go beyond both. Relativists must discount the way in which social and cultural structures provide the ‘degrees of freedom’ within which agents act, and which facilitates or impedes their purposeful action, because to admit that social and cultural structures exist independently of processes of instantiation by agents is to be once again guilty of the sin of reification. Consequently, unlike realists, relativists deny that agents confront a (social, cultural and material) *prestructured* environment which set parameters for the course of action they may choose. This is because they insist “that the elementary structures of society are nothing but (relatively enduring) sets of interpretations” which consequently do not have a material dimension, or a relatively autonomous existence independent of individuals in society (Archer, 1998: 198). In contrast, realists recognise that individuals exercise free will, but not in conditions of their own choosing.

Implications for curriculum

The above analysis has implications for the curriculum. It asserts the relative independence of propositional knowledge, by arguing that knowledge already produced transcends the community of producers that produced it. This says nothing about the conditions of its production, or its continuing veracity as the objects and processes it describes changes (that is, changes in the nature of the object, or ontological changes) or as we develop alternative and better understandings (epistemological changes). Knowledge is a collective resource that has been collectively produced, and can be only changed through agency, and can only be used by agency. The insistence on the relative autonomy of the existing body of knowledge becomes a process of reification only if we argue that the emergent properties of knowledge are efficacious in spite of people, and not (as it must be) through people (Willmott, 2002). The *sui generis* reality of knowledge arises because all knowledge (in whatever form it is codified) has the dispositional capacity to be understood (Archer, 1995; Willmott, 2002). Knowledge ‘products’ stand in a *logical* relationship to each other, whereas agents stand in a *causal* relationship to each other. Ideas can be independent of each other, or in opposition or related to each other depending on the extent to which they are logically related. The logical consistency of ideas is independent of power relations. This is quite different to relations between actors, where propositional knowledge can be in contradiction, and causal consensus between actors is “intimately allied to the use of power and influence” (Archer, 1995: 179). This helps us to separate the knowledge produced by communities of producers from the power relations that structure the process of production, even though those power relations will in part shape the knowledge so produced.

This does not explain though, why propositional knowledge is still relevant for the curriculum, and to do so we must come back to the realist notion of emergence. Because both CBT theorists and strong constructivists focus on the level of actions, neither is able to

identify the generative mechanisms that produce actions. I argue that propositional knowledge (which has been embodied to varying degrees and reflected in different ways of knowing) constitutes a necessary part of the mechanisms that contributes to Mode 2 knowledge. Or, to put it in the language of activity theory, it is a necessary tool used within an activity system to mediate human activity towards fulfilment of an objective (Engeström, 1999). Muller (2000) argues that the extent to which Mode 2 knowledge arises from Mode 1 knowledge has not been sufficiently realised, and this is the reason why the two kinds of knowledge have to be kept in creative tension in the curriculum.

Muller also makes the point that those institutions most likely to focus on Mode 2 knowledge are less likely to be the elite institutions developed through years of vast resourcing by the state and privileged access for the elites. The elites will still focus on 'powerful' knowledge represented in the disciplines (even if the social boundaries defining the disciplines change over time), while the rest will focus on applied knowledge. Muller (2000) argues that, paradoxically, efforts by relativists to democratise knowledge by insisting on the equivalence of all ways of knowing has the unintended consequence of locking out the non-powerful from powerful knowledge. It is not enough to assert equivalence; privilege emerges from the interplay of material and social dimensions, not merely through changing subjectivities. Rather, we should be arguing for *access* to powerful knowledge for the non-powerful through challenging social, cultural and economic structures. This fully admits the possibility that powerful knowledge will change its character because it is socially produced, but because it is not purely self-referential, it will also help us to understand the world to a greater extent, because the world cannot be reduced to our conceptions of it.

Implications for processes of learning

There is no way around it: learning (including learning for a vocation) must include propositional knowledge. This means that 'underpinning knowledge' must be explicitly integrated within VET qualifications, along with (and probably more importantly than) material tools and artefacts. We must pay the same level of attention to teaching students to use these conceptual tools as we do other tools.

Young (2003: 113) argues that knowledge is external to learners and those trying to create new knowledge. He calls his approach *social realism*: it is social because "it recognises the role of human agency in the production of knowledge"; and, realist because it recognises the "context independent characteristics of knowledge" (Young, 2003: 113).

Students (particularly those from non-powerful social groups) need access to knowledge – they need to become part of the social process of its production, and be able to work with and transform it. To do so, knowledge must become embodied, and this means that learners have to engage in socially meaningful processes of construction which integrates knowledge (which initially is external) with what they already know. In rejecting Cartesian dualism, critical realism argues that we create knowledge through our practice in the world. The knowledge that we create is consequently *relational*, while recognising that it arises from practice which extends beyond discourse, and comprises a material dimension and a prestructured social context.

In using the notion of emergence, Archer (2000: 121) argues that it is our practice in the world that gives rise to our self-consciousness, explaining that this position "is a refusal to accord primacy to language... This is not simply of matter of [practice] coming before anything else, though temporally it does just that; it is also a question of viewing language itself as a practical activity, which means taking seriously that our words are quite literally deeds, and ones which do not enjoy hegemony over our other doings in the emergence of our sense of self." Our practice in the world gives rise to different ways of knowing, which

includes knowing with our bodies as well as our minds. Moreover, Archer argues, some knowledge can only be known with our bodies and cannot be represented discursively.

I think the notion of emergence is very useful for understanding processes of learning, because the individual is always in a process of *becoming* through emergence that arises from practice (Beach, 1999). It is *relational*, and therefore rejects individualistic notions of skill and skill development. It can provide insights into the way in which individuals (and more broadly, groups) are fundamentally transformed through processes of learning. Consequently, the approach outlined here cannot be equated to the position critiqued by Hager who criticises theories that posit knowledge as external to knowing subjects. Hager (2004: 5) (in citing the work of Lakoff & Johnson) describes such approaches as learning as *product* which “views the mind as a ‘container’ and ‘knowledge as a type of substance’” (the sin of reification). Such an approach sees the individual as collecting discrete bits and pieces of knowledge and skill, and adding to it here and there, without being transformed in any fundamental way. This is a bit like stuffing a filing cabinet with new bits of paper. In contrast, even though the approach I’m outlining here insists on the *sui generis* independence of knowledge (in the sense that it transcends the context in which it was produced), a relational philosophy insists that through processes of emergence mediated by our practice in the world, the individual (or the group, in the case of distributed and collective knowledge and skill) is transformed, and in the process of integrating knowledge with what they already know and can do, potentially transforms that knowledge as they embody it.

This is most clearly demonstrated in comparing the way experts and novices use tacit knowledge. Tacit knowledge is often reduced to skill, whereas Stevenson (2001: 657) argues that it is much more complex than this: “...it seems inappropriate to dismiss tacitness as a characteristic only of skills. Tacit knowing also seems to have a central place in the situational, conceptual, procedural and strategic knowledge of experts.” Tacit knowledge or expertise includes the knowledge, concepts, ideas and experiences that we have internalised. Bransford and Schwartz (1999: 69-70) refer to this as ‘knowing with’, and explain that people “‘know with’ their previously acquired concepts and experiences....By ‘knowing with’ our cumulative set of knowledge and experiences, we perceive, interpret, and judge situations based on our past experiences”. Stevenson argues that experts are distinguished from novices because of their capacity to connect different kinds of meaning. He explains that “An expert derives this facility from many experiences, connecting the various meanings that the experiences offer, as well as meanings that others construct on those experiences” (Stevenson, 2003: 5).

Whilst not necessarily attributing this idea to any of these theorists, I argue that they are describing processes of emergence (and not filing things in our heads), arising from the interplay of the individual, their social and cultural context, the tools (which includes intellectual tools) they are using and their practice. The notion that codified knowledge is less important arises from the false distinction between propositional and procedural knowledge (when embodied), and the exclusion of theories and concepts from tacit knowledge instead of seeing tacit knowledge as the outcome of emergence which includes theories and concepts. In other words, codified knowledge is embodied through processes of emergence, and this is fundamental for expert practice. This approach also accommodates change, because it does not seek to find all knowledge within the activity system or community of practice, rather arguing that the knowledge that we need to use (or *could* productively use) does not always directly arise from the context of our practice (Young, 2001). Rather, new knowledge is incorporated (and in the process changed) in the activity system through processes of emergence. This argues again for a creative tension between Mode 1 and Mode 2 knowledge. It goes beyond the level of actions to understand the generative mechanisms that allow for the realisation of Mode 2 knowledge in its context of application. It also restores the importance

of human creativity and ingenuity, because humans have to see beyond the immediate and historical to incorporate the new in order to imagine the future.

The argument that learning involves processes of embodiment emerging from the interplay of different causal mechanisms also presupposes a continuous individual with a sense of self that persists over different contexts and periods of time (Archer, 2000). This individual is historically specific, with a history and trajectory that emerges through their 'going about' in the world (Collier, 1999). This is not the abstract individual of liberalism with fully formed and relatively unchanging preferences engaged in the pursuit of self-interested instrumental maximisation, but a historically specific individual who emerges from a myriad of relational practices, and who changes throughout the course of their lives. Their capacity to be effective at work is not just a consequence of specific skills – rather this capacity is grounded in the self the person becomes as a consequence of needing to live in their whole world, and needing wide-ranging knowledge and skills to do so.

In contrast, CBT abstracts skills from the people who exercise them, because it aggregates and commodifies skills, knowledge, and qualifications. The problem of skill becomes one of supply and demand in the market place: industry needs specific skills, and education providers must provide them. This leaves out of the understanding the person who must exercise those skills, and what they need to do so. Having ensured a person is competent in one context, it is assumed they are competent in the same or similar skills in many contexts, because the very notion of skill has become abstracted and unconnected from a relational framework in the process of becoming a commodity to be exchanged in a market. This is because of CBT's focus on the level of actions and not on underlying mechanisms. On the other hand, many socio-cultural theories, in focussing on 'authentic' contexts and intersubjective understanding are not able to account for the way in which we perceive continuities, regularities and clusters in complex, content-dependent events (Beach, 1999). Because the exercise of skill is situated and learning requires real engagement in a specific context (because all learning takes place in real time in real places), strong constructivists are not able to go beyond the context to see what transcends that context. Again, this is because of their focus on the level of actions. A realist conception argues that the exercise of skill and learning are not reducible to the context in which they were developed, because both involve the interplay of generative mechanisms that are relatively enduring and transcend the particular context, even though a specific context is required for such interaction to take place. This includes a continuous individual with a sense of self and continuity over different contexts who is enmeshed in myriad relational practices which have enduring consequences. It also includes the broader social, cultural and material environment, which includes propositional knowledge.

Beach (1999) argues for a theory of curriculum based on 'consequential transitions', which engages individuals in learning in multiple contexts, all which require them to re-contextualise learning and make new connections. Rather than the aim of teaching being to move students to greater levels of generalisation founded on further levels of abstraction, he argues "that curriculums and teaching should support generalization that moves toward an integration of the diverse aspects of a concept and reveals the interconnected nature of its different aspects" (Beach, 1999: 112). If learning is fundamentally a process of embodiment, and expert practice consists in making connections between different kinds of meaning in different contexts (Stevenson, 2003), then learning cannot be based on greater levels of abstraction, because if it is to be embodied, it must engage the learner in personally meaningful processes. Beach (1999: 114) argues that the consequential transitions "involves the continuity and/or transformation of knowledge, skill, and identity embodied in the relation" between the individual, their practice and their context.

There are three reasons then why learning should not be restricted to the work-place or for learning for work: first, students need knowledge and skills to live in their *whole* world as a precondition for exercising knowledge and skill in their world of work; second, the knowledge that we need does not always arise from our practice, and we need the capacity to make connections with knowledge that is initially external to us and our context and creatively apply it to new contexts; and third, if learning is to go beyond the contextual and situational, it must involve learners in processes of recontextualising over many different sites. Both CBT and strong constructivists, in focusing on learning in and for work, conflate the learning needs of individuals with the skill needs of their enterprises. Enterprises may need skills 'just in time and just for my organisation', but these must be embodied in the individuals who will exercise the skills, and processes of embodiment emerge from complex interactions which go beyond the work-place. This includes the individual making connections between propositional and codified knowledge and other ways of knowing.

Conclusion

Young (2003: 115) argues that "New knowledge and new curricula are generated when researchers or learners acquire and build on existing knowledge and concepts from specific fields and disciplines to make sense of or transform the world." This allows us to understand that learning is a socially mediated and constructivist process which occurs through engagement in the world, while also insisting on judgemental relativity about knowledge. Some knowledge and theories are better than others because they allow us to understand the world more effectively. Knowledge is, as Young argues, a distinct and non-reducible element of the curriculum. I argue also that it must go beyond work or learning for work because learning is an emergent process that engages the learner in complex relational practices that have enduring consequences which go beyond the contextual and situational on the one hand, and that what we observe in the contextual and situational emerges from this complexity on the other. This allows us to understand the process of emergence which characterises the relationship between Mode 1 and Mode 2 knowledge – both must be kept in creative tension in the curriculum of the future, because both require the other for their elaboration through the process of application.

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