

Rethinking Connectivity as Recontextualisation

Issues for Research and Practice

DAVID GUILÉ

Konnektivität als Rekontextualisierung überdenken

Fragestellungen für Forschung und Praxis

Abstract: This contribution explains why, once a number of issues which were an explicit and implicit feature of the *connective typology of work experience* (GRIFFITHS/GUILÉ, 2004) are conceptualised as the *recontextualisation of knowledge*, it becomes possible to see that boundary crossing is a ubiquitous feature of vocational and professional education, rather than an issue of learners crossing the boundary between education and work. The contribution tackles this goal in the following way. Firstly, it offers a brief explanation of the development of the connective typology of work experience. Next, it explains why the notion of ‘resitiation’ in the connective typology of work experience was an early, but circumscribed, attempt to articulate the concept of recontextualisation. It then explains the origins and development of the concept of recontextualisation and that this concept offers a unified perspective on initial and continuing vocational formation. The contribution concludes by identifying a) the practical implication of the concept of recontextualisation for capacity/competence development and b) the future research challenge for VET, especially in relation to the emergence of 4th generation technologies.

Keywords: Recontextualisation, Connectivity, Connective Model of Work Experience, Situated Learning, Cultural-historical Activity Theory

Kurzfassung: Dieser Beitrag legt dar, warum es möglich wird, Grenzüberschreitungen als ein allgegenwärtiges Merkmal der beruflichen Aus- und Weiterbildung zu sehen – und nicht als ein Problem von Lernenden, die die Grenze zwischen Bildung und Arbeit überschreiten – sobald einige explizite und implizite Merkmale der konnektiven Typologie der beruflichen Erfahrung (GRIFFITHS/GUILÉ, 2004) als Rekontextualisierung von Wissen konzipiert werden. Der Beitrag geht dieses Ziel wie folgt an: Als erstes wird eine kurze Erklärung für die Entwicklung der konnektiven Typologie der beruflichen Erfahrung gegeben. Als nächstes wird erklärt, warum der Begriff der „Resitiation“ in

der konnektiven Typologie der Berufserfahrung ein früher, aber begrenzter Versuch war, den Begriff der Rekontextualisierung zu artikulieren. Dann werden die Ursprünge und die Entwicklung des Konzepts der Rekontextualisierung erörtert sowie die Idee, dass dieses Konzept eine einheitliche Perspektive auf die berufliche Aus- und Weiterbildung bietet. Der Beitrag schließt mit der Identifizierung a) der praktischen Bedeutung des Konzepts der Rekontextualisierung für die Kompetenzentwicklung und b) der künftigen Herausforderungen für die Berufsbildungsforschung, insbesondere im Zusammenhang mit der Entstehung von Technologien der vierten Generation.

Schlagworte: Rekontextualisierung, Konnektivität, Connective Model of Work Experience, Situated Learning, Kulturhistorische Handlungstheorie

1 Introduction

The connective model of work experience (GRIFFITHS/GUILLE, 2004) emerged as part of a typology of work experience in response to the growing interest among policy-makers in the late 1980s/early 1990s to either strengthen work experience in vocational programmes or introduce work experience in general education, to assist learners to make more effective transitions into the labour market. Over time, I have come to recognise a number of limitations in the connective model, for example, the conflation of the different outcomes from the use of work experience in apprenticeship compared with academic or vocational programmes (GUILLE, 2018). This contribution builds on that self-reflective critique by highlighting an aspect, which is central to this Special Issue. This aspect is the recognition that boundary crossing is a ubiquitous feature of the design and delivery of vocational and professional education and vocational and professional practice throughout the life-course, rather than an issue of learners crossing the boundary (material or symbolic) between education and work, prior to gaining employment (see (AKKERMAN/BAKKER, 2011, 2012) for a summary of the latter perspective on boundary crossing). The contribution makes this case in the following way. Firstly, it offers a brief explanation of the development of the connective typology of work experience. Next, it explains why the notion of 'resitiation' in the connective typology of work experience was an early, but circumscribed, attempt to articulate the concept of recontextualisation. It then explains the origins and development of the concept of recontextualisation and what this concept offers a unified perspective on initial and continuing vocational formation. The contribution concludes by identifying a) the practical implication of concept of recontextualisation for capacity/competence development and b) the future research challenge for VET, especially in relation in the emergence of 4th generation technologies.

2 The connective model of work experience

Main influences

The main intellectual influences on the connective model of work experience were the debates in research and policy circles worldwide in the 1990s about: (i) the new role of knowledge in the economy via the concept of the ‘knowledge economy’ (see GUILLE, 2010 for a summary of the debate); and (ii) the relative merits of ‘cognitive’ versus ‘situative’ theories of learning (see SFARD, 1998 for a summary of the debate), and their implications for work experience. The main methodological influence was WEBER’S (1949) concept of ‘ideal types.’ This was used as a resource to: a) illustrate how the assumptions made by educational institutions, employers and policymakers about the purpose and process of work experience which were, in turn, influenced by ideas about knowledge and learning, influenced the design of each stage, phase and outcome of different models of work experience; and b) offer all parties involved with the planning and delivery of work experience a framework to critically appraise their role in facilitating learners to make connections between each of the different phases and stages.

Knowledge economy debate

The initial interest in the relationship between economic and technological change and the increased role of knowledge in the economy originated in the sociological debates in the late 1960s and early 1970s about the transition from an industrial to a post-industrial society (BELL, 1973), and culminated in the mid-1990s with the argument that information (CASTELLS, 1996) r knowledge (STEHR, 1994) societies had superseded post-industrial societies. This perspective on the knowledge economy took as axiomatic that: (i) codified knowledge had become central to the production of goods and services and was the primary condition for their further expansion as well as for the limits to economic growth; and (ii) new sources of wealth were based upon the creative capacity of individuals and organisations to use scientific or theoretical knowledge innovatively. This argument about the increased role of knowledge in the economy triggered throughout the 1990s, however, a related debate about the contribution of knowledge to innovation. Instead of seeing innovation as an exogenous process driven by the application of highly abstract and codified forms of scientific knowledge developed outside the workplace, writers in fields, such as Organizational Science, adopted an endogenous perspective on innovation and argued that a new economic and organisational imperative had emerged which placed enterprises under increased pressure to use their intangible assets (the knowledge and skills of their workforce) to innovate and create value for shareholders and customers (NONAKA/TAKEUCHI, 1995; SPENDER/GRANT, 1996). The challenge for organisations from the

organizational studies perspective (EASTERBY-SMITH, 2005) was therefore to build, combine and integrate knowledge assets, in other words, the diverse forms of theoretical and practical knowledge, held by workplace communities, to assist organisations to enhance their product and service delivery. This argument about the role of knowledge in innovation introduced therefore the theory-practice issue into the knowledge economy debate.

The idea that all forms of knowledge represented the primary source of wealth and innovation became in the case of the European Union, famously, coupled with lifelong learning in the European Memorandum on Lifelong Learning, and presented as the rationale for purpose of education and training policies (EU, 2000). One response to this development in EU Member States and other countries was that policymakers urged Upper Secondary and Vocational Education to strengthen existing initiatives that had been designed to support the transition of young people from school to work and to enhance their future employability. Two of the most common measures were to encourage schools and vocational institutions to increase the opportunities for post-16 students to undertake work experience and to fund new educational programmes which include a work experience component for unemployed or disaffected young people (GRIFFITHS/GUILÉ, 2004).

These initiatives tended, as TONI GRIFFITHS and I argued (GRIFFITHS/GUILÉ, 2004), to rely on the assumption that an *experience* of work (i. e. time spent in a workplace) was sufficient to prepare learners for employment, rather than to explicitly consider how learners related theoretical and practical knowledge to one another and the role of all parties involved in the design and delivery of work experience in facilitating that development (GRIFFITHS/GUILÉ, 2004). This focus on experience of work rather than the process of learning that inevitably informed such experiences led us to consider the relationship between the debate about learning, which had surfaced in the late 1980s/90s in the USA, for the knowledge economy debate, and subsequently the implications of our conclusions about both debates for work experience.

Learning debate

The origins of what became known as the ‘cognitive’ versus ‘situative’ (hereafter situated) debate in the Learning Sciences (see SFARD 1998 for a summary) lay in JEAN LAVE’s book *Cognition in Practice* (LAVE, 1988), where she developed a devastating critique of cognitivism, and her subsequent book with ETIENNE WENGER *Situated Learning* (LAVE & WENGER, 1991) where both writers developed a new theory of learning. This theory was based on the notion that people learn by ‘participating’ in the routines and technologies of a ‘community of practice’ via access to ‘learning curriculum’, in other words, a sequenced and controlled way for less experienced workers – sometimes referred to as novices – to move from undertaking routine to novel tasks in workplaces.

In doing so, LAVE AND WENGER (1991) put forward an explanation of how people develop, simultaneously, occupational expertise and identity in workplaces.

Inspired by the publication of *Cognition in Practice* and *Situated Learning*, a number of writers began in the 1990s to use LAVE'S ideas of a social theory of learning to analyse the forms of learning that occurred between education and work (see *inter alia* AINLEY/RAINBIRD, 1999; BILLET, 2001; EVANS/HODGKINSON/UNWIN, 2002; RAINBIRD/FULLER/MUNRO, 2004). One development that caught TONI GRIFFITHS and my eye was BEACH'S (1999) concept of 'consequential transition' (BEACH, 1999) for two main reasons: BEACH (1999) firstly, argued that one of his aims in formulating the concept of consequential transition was to engage with LAVE'S criticism of cognitive theories of transfer, and to provide an alternative social theorisation of the processes transfer denoted; and secondly, explored his concept empirically through reference to work experience (BEACH/VYAS, 1999). The main idea behind BEACH'S concept was that it stressed movement in relation to purpose and thus revealed how learners' knowledge, skills and identity may change as they undertake work experience. He identified four different types of consequential transitions – lateral, collateral, encompassing and mediational. The first and second pair (lateral and collateral) referred to learners moving between sets of activities that are changing slowly compared to the changes that learners' experience as they move between them, for example, workplaces with well-established routines and learners who are feeling nervous, excited and challenged working in a new environment. The third and fourth pair (encompassing and mediational) referred to the rapid rate of change in an activity compared to the change that is required by the individual involved, for example, workplaces introducing new knowledge management practices which are as challenging for existing workers as they are for learners undertaking work experience.

To explain the relationship between movement and purpose in these different types of transition, BEACH (1999) further distinguished between the type of learning that occurred in education compared with workplaces. He defined the former as 'vertical development', in other words, way in which learners in schools engaged in the hierarchical acquisition of knowledge and skill through the apprehension of sets of concepts of ever greater abstraction or mastering higher levels of technical or craft-based skill, and the latter as 'horizontal' development', the way in which learners acquired forms of knowledge in curriculum contexts and this form of situated knowledge can take a variety of forms: it could be knowledge about how to participate in a community of practice, to change and vary work practices or to connect different fragments of codified knowledge to resolve work problems. We argued that the implication of BEACH'S distinction was that if young people were to benefit from work experience, it was important for them to learn how to relate their vertical and horizontal development and that both schools and workplaces had a pedagogic role in supporting this process. To do so, we invoked the concept of 'resituation'. This concept underpinned, as will become

clear below, the premise of the connective model of work experience and, moreover, differentiated it from the other models of work experience contained in the typology.

Connective typology of work experience

We turned to WEBER'S (1949) concept of an 'ideal type' to help us to construct a typology to identify the extent to which different models of work experience assisted learners related theoretical and practical knowledge to one another, and develop the capability to resituate them as well as the role of all parties involved in the design and delivery of work experience in facilitating that development. WEBER'S great insight was that the challenge for sociologists was to not only describe the actions of the activity they were studying, but also to interpret that activity. To do so, he argued that it was necessary to form an ideal typification of the characteristics and elements of the activity under investigation, and this involved stress the characteristics and elements common to most cases of that activity conceptually and empirically. WEBER (1949) acknowledged however that the validity of an ideal type is ascertained in terms of its adequacy in relation to the activity or phenomena it pertains to, rather than its reproduction of or correspondence with social reality. We identified therefore the way in which the assumptions made by educational institutions, employers and policymakers about a) the purpose of work experience, for example, have an 'experience' or relate theory and practice to one another influenced the design of each stage, phase and outcome of different models, and b) the nature of learning, for example, learning from experience, transfer theory to practice etc., could be used by all parties involved with the planning and delivery of work experience to appraise critically their role in facilitating learners to make connections between each of the different phases and stages. In doing so, we argued that the typology offered fresh thinking about the future design and delivery of work experience because it offered a framework to compare and contrast the processes, outcomes etc. associated with different models of work experience. The criteria were:

- (a) the purpose of work experience (i. e. the reason for providing it);
- (b) the assumptions about learning and development (i. e. the ideas about pedagogy and learning in workplaces);
- (c) the practice of work experience (i. e. the types of practice which facilitate learning through work experience);
- (d) the role of the education and training provider (i. e. the pedagogic strategies employed in vocational education to support students in learning);
- (e) the outcome of the work experience (i. e. the form of knowledge, skill or broader capabilities that students have developed).

The five criteria were derived as follows. We firstly extended BEACH's (1999) argument about the relationship between movement and purpose and the development of expertise and identity to highlight the relationship between the purpose and outcome of work experience. Secondly, LAVE AND WENGER's (1991) argument that learning in workplaces entails participation in occupational practice, supported by access to learning curricula, was used to establish what was distinctive about the forms of learning that occurred in workplaces. The third criteria combined insights from BEACH and LAVE AND WENGER, for example, that learning is a back and forth movement between education and work which requires learners to vary their participation in both contexts by engaging dialogically with occupational practice, to draw attention to the pedagogic practices which facilitate the development of knowledge and skill through work experience. Fourthly, BEACH's distinction between vertical and horizontal learning was used to clarify the nature of the challenge that educational institutions and workplaces had to address if they were to support learners on academic and vocational programmes to integrate work experience with both forms of learning. Finally, the argument that all forms of knowledge (theoretical and practical) play a part in facilitating innovation in workplaces was used to affirm the aspirations of the EU Memorandum of Lifelong Learning that learners should be encouraged to identify knowledge and skills they had developed, irrespective of the context where they were learnt. All the models contained in the above typology were therefore analytical rather than descriptive, as such, no specific work experience programme necessarily fitted neatly into any of the models and some programmes may contain elements of more than one model. An overview of the models derived from the five criteria is depicted in table 1. Typology of work experience.

Tab. 1. Typology of work experience (GRIFFITHS/GUILLE, 2004)

MODEL OF WORK EXPERIENCE	Traditional Model 1	Experiential Model 2	Generic Model 3	Work Process Model 4	Connective Model 5
Purpose of work experience	'Launch' into work	'Co-development' between education and work	Key skill/competence assessment	'Attunement' to work environment	'Reflexivity'
Assumption about learning and development	Adaption	Adaption and self-awareness	Self-management	Adjust and transfer	Vertical and horizontal development
Practice of work experience	Managing tasks and Instructions	Managing contributions	Managing action plan and learning outcomes	Managing work processes, relationships and customers	Developing the connective practices
		PLUS – recording experiences	PLUS – managing situations	PLUS – adding value for employer – supporting employability	PLUS 'entrepreneurialability'
Management of work experience	Supervision	Arms-length supervision	Facilitation	Coaching	Developing and resituating learning
Role of education and training provider	<i>Provide:</i> formal preparation programme	<i>Facilitate:</i> briefing for and de-briefing of work experience	<i>Build:</i> portfolio of achievements	<i>Support:</i> reflection-in and on-action	<i>Develop</i> partnerships with workplaces to create: environments for learning
Outcome of work experience	Skill acquisition Knowledge of 'work readiness'	Economic and industrial awareness	Assessed learning outcomes	System thinking	Polycontextual and connective skills

Connective model of work experience and the concept of resituation

The connective model was an explicit attempt to construct a model of work experience that took explicit account of the relationship between vertical and horizontal development, which was either an unaddressed (see traditional, experiential, generic models) or underdeveloped (see work process model) feature of the other models contained in the typology. Based on BEACH's engagement with Cultural-historical Activity Theory, the concept of vertical development was interpreted as an alternative way of expressing VYGOTSKY's idea that when students learn theoretical concepts in a Zone of Proximal Development (ZPD) in an educational institution they learn to appreciate both the meaning of, and relationship between, concepts and, in doing so, they develop a progressively more complex understanding of the domain knowledge they are studying and the concepts associated with that domain. In making this assumption, we implicitly accepted that such knowledge was 'context-free', in other words, we treated curricula as a neutral transmission mechanism, and theory came before practice (GRIFIFTHS/GUILE, 2004). Furthermore, acknowledging the influence of LAVE AND WENGER (1991) on BEACH (1999), the concept of vertical development was interpreted as an argument that the forms of knowledge and skills learnt in workplaces was situated. These different conclusions about vertical and horizontal development led us to argue that if the theoretical knowledge learnt in any educational institution (academic or vocational) was to be a resource for learners to understand, engage with and even critique, the forms of occupational practice they encountered in workplaces, then learners would have to be supported to 'resituate' their theoretical knowledge in the context of work.

The connective model of work experience was therefore predicated on the assumption that learners would have to be supported to boundary cross, that is, move back and forth between education and work and, moreover, this involved pedagogic challenges for educational institutions and workplaces. The educational pedagogic challenge of resituation was defined as follows: assisting learners to grasp the relationship between the theoretical concepts, which constitute the content of the educational programme they may be studying, and occupationally-specific and organizationally-general work practices and routines, by explicitly exploring their understanding of this relationship dialogically with their workplace supervisor and their teachers during de-brief sessions post-work experience. The workplaces pedagogic challenge was defined as ensuring that staff supervising learners on work placements provided time for learners to ask questions about their participation in occupational practices and routines, the rationale for the construction of those routines and so forth.

The above argument about understanding the relationship between theoretical concepts and occupational practice rested on an implicit acceptance of, what BRANDOM (2000) refers to as, the 'representational paradigm': the idea that concepts either do or can be made to map fairly un-problematically onto the world (see BAKKER/DERRY, 2011 for a similar account of this argument). A classic example would be a

learner studying Business Economics who was introduced to the concept of the occupational division of labour, and was then asked as part of an educational assignment to identify how the organisation of work did or did not exemplify that concept, and the extent to which this division of labour facilitated or hindered the process of production. Expressed in the lexicon of resituation, the learner was firstly, assessing the fit or significance of a concept that had been learnt in an educational context in relation to potential manifestations of that concept in the context of work. Secondly, reporting on their deliberations about the workplace manifestations of that concept in an educational assignment which would be submitted for appraisal or assessment in an educational context.

At the time, our argument that resituation constituted a pedagogic process those involved in work experience could use to 'close the gap' between the context of education and work and, in the process, develop in learner the type knowledge and skills that were deemed essential for the knowledge economy, seemed to be a considerable advance on debates in the work experience literature about learning through work experience (MILLER/JAMIESON/WATTS, 1991; MILLER, 1995) and also the emerging debate about boundary crossing in VET (TUOMI-GRÖHN/ENGSTRÖM, 2003). The former debate was primarily informed by BOUD AND COLLEAGUES (BOUD/KEOGH/WALKER, 1985) popularisation of KOLB'S (1984) concept of experiential learning. As a consequence, work experience was treated as an addition to a learners' portfolio of 'experiences' which they were responsible for self-managing (see generic model) or transferring (see work process model) into other contexts, rather than an opportunity for teachers and workplace supervisors to work together to assist learners to develop the ability to integrate theory and practice to prepare them for employment in the knowledge economy. While the latter debate tended to focus more on rethinking the 'object of activity' between workplaces and educational institutions to facilitate boundary crossing, rather than rethinking the relationship between vertical and horizontal development.

During my investigations of various forms of workplace learning over the next few years (see GUILÉ, 2010; GUILÉ, 2011a, b, GUILÉ, 2014; GUILÉ/AHMED, 2011, I began to appreciate the oversights that informed, and the underdeveloped nature of, the concept of resituation. I recognised that, in the case of the former, all forms of knowledge and learning are situated or contextualised in two senses (SÄLJÖ, 2009): first in an organisational context, for example, educational institution or workplace, and second in organisational practice, for example, curriculum or occupational routines. Furthermore, in the case of the situation of knowledge and learning in curriculum or occupational routines, there was an 'inferential' dimension to the way people grasped the meaning of language and actions (BRANDOM, 2000). These implications of SÄLJÖ'S and BRANDOM'S insights, along with the influence of Cultural-Historical Theory on my thinking, for the replacement of the concept of resituation by the concept of recontextualisation are explored below.

3 The concept of recontextualisation

Key influences

The primary inspiration for replacing the concept of resituation with the concept of recontextualisation came, as I explained in *The Learning Challenge of the Knowledge Economy* (GUILLE, 2010), from a number of writers in Cultural-historical Activity Theory or in fields with similar mediated conceptions of the relationship between mind and world. The first idea was VAN OERS' (1998 p. 138) argument that the criticism levelled against VYGOTSKY by WELLS (1999) and WERTSCH (1985) that he operated with a decontextualized conception of knowledge was misplaced, and that it was more accurate to understand VYGOTSKY'S position as one implying the 'progressive recontextualisation' of knowledge through forms of social practice. Despite the broad similarities between the notions of resituation and recontextualisation, I decided for the sake of consistency in lexicon to adopt VAN OERS formulation.

VAN OERS (1998, p. 138) explained his ideas about recontextualisation by drawing on LEONT'EV'S (1978) notion of 'activity development', in other words, that the *purpose* of an activity influences the way in which we use any – conceptual or material – resource to help us address a problem we are working on. Based on this idea, VAN OERS (1998, p. 138) argued that as we understand a concept, which has most probably been introduced to us in relation to an educational purpose, for example, domain study, we are positioned to use that concept as a resource to help us enrich our educational or everyday activities or as a source of inspiration to generate a new activity. Using the example of the mathematical concept of 'number' and the social practice of 'play', VAN OERS (1998, p. 140) discussed how as young children learn the concept of number they are positioned to use that concept to expand the repertoire of activities they engage in when they are playing, for example, in the (simulated) context of running a shop. The theoretical concept of number becomes, as VAN OERS (Ibid.) observed, a resource the children use to enhance one of their everyday activities, in this case, pretending to run a shoe shop, and actions they engage in whilst doing so, such as classifying objects. These new options are possible because, the children are now able to use the concept of number to, for example, classify by type, colour, size and amount, and therefore create a richer game for themselves. The children have therefore recontextualised the concept of number, that is, allowed the purpose of the activity they are engaged in to not only influence their use of a concept they learnt in another context, but also to introduce the idea that social practices never exist in isolation from one another: the practice of playing shop presupposes the practice of buying commodities from a shop.

VAN OERS (1998), therefore, made a much more insightful and generative argument than his example initially conveyed. The argument that learners can choose to recontextualise the concepts they have learnt in school, or for that matter other contexts, such as work, and use them as a resource in their everyday activities, applies to every-

one, irrespective of the activity they are engaged in, throughout the life-course and therefore in vocational education and workplace learning. The context and process of recontextualisation are however rather underdeveloped in VAN OERS' work because he described the outcome of the activity children he studied were performing, rather than probing their decision-making processes. To address this issue, I turned to BRANDOM's (2000) ideas about inference. BRANDOM's work is important because he draws attention to the role of inference facilitating judgement in decision making in general in all human activity. It is a short step from here therefore, as I have argued elsewhere (GUILLE, 2010) to understand how inference provides a way to identify the distinctive character of the process of recontextualisation.

The distinctive characteristics of all human activity, according to BRANDOM (2000), is that forming a judgement presupposes *inferring*, in other words, ascertaining what follows from different types of concepts or actions and responding accordingly in specific situations. Thus, for BRANDOM, we grasp the meaning of any type of concept as we understand the inferences that can be made from and to it and can articulate those inferences intelligibly, in written or oral form (GUILLE, 2010). By this I mean that we understand a theoretical concept, for example, the symbol – ZPD – that characterises the concept the Zone of Proximal Development, or form of pedagogic practice – scaffolding – associated with the concept, by inferring 'what follows' from the symbol or actions and tools in a specific context (usually an educational context). From this perspective, claims need to be justified, the process of justification needs recourse to reasons, reasons are assessed in a normative context. That context is, according to BRANDOM (2000), the 'space of reasons'. The space of reasons is however differentiated: in the case of a vocational curriculum the theoretical reasons associated with disciplines sit alongside the vocational reasons associated with vocational perception and action. This differentiation presents different, but ultimately, related challenges for someone studying a vocational programme.

The first challenge for a learner is to develop the capability to manifest their understanding to others by participating in, what BRANDOM (2000) refers to as, the social practice of giving and asking for reasons. From this perspective, theoretical reasoning involves, at a minimum, the ability to: a) understand the conceptual structure of a discipline; b) to locate a concept in its sub-field within the discipline; and, c) infer relationship from that concept to other concepts. In contrast, practical or vocational reasoning, involves a learner developing the capability to use disciplinary knowledge, in conjunction with vocational experience, as a resource in a specific context to pick out the salient features of that situation or event, and to then infer what follows and how to act (GUILLE, 2010, p. 135–139). Engineering provides a good way to illustrate the previous issues (GUILLE, forthcoming) because, in the case of construction engineering, all engineers have to reconcile the mismatch that can exist between the theory they have been taught in relation to the natural environment. One way to illustrate this dilemma is to consider the difference between the way in which the theory of friction and in-

terlocking of soil textures or particles is taught in a degree, such as civil or mechanical engineering, compared with their on-site manifestation. Students are usually taught, in the case of the former, that the interlocking of soil textures or particles allows soils to sustain stress and this mechanism influences the way that soil moves under stress. They are therefore encouraged to look for simple guiding principles that will hold generally true in a range of situations by identifying linear relationships for strength and stiffness of soils. On site, however, things can look very different. Students now employed as engineers often encounter sites with variable ground conditions, and the linear assumptions they learnt while studying their degree do not necessarily apply. The challenge they face is therefore to take account of the characteristics of the soil they are encountering, and to infer whether the theoretical presuppositions or universal rules they learnt while studying can be 'bent' (in my terms, recontextualised) to offer them a clue to determine how to proceed. In doing so, engineers are engaging in professional or vocational rather than theoretical reasoning. Theoretical reasoning and vocational or professional reasoning are both underpinned and informed by normative conventions and standards. The difference between them is that the conventions and standards of the former are determined purely by the domain, whereas the conventions and standards of the latter are a comingling of practical and theoretical considerations, as the above example illustrates.

The second challenge for a vocational and/or professional learner is to develop the capability to express or convey the outcomes of their theoretical and practical reasoning in accordance with two different conventions and standards. Learners have to express their judgements in two different ways. They have to, in the case of their theoretical reasoning, express their judgements in accordance with in the lexicon and protocols associated with different academic modes of assessment, for example, written assignment, multiple choice test etc. However, in the case of vocational (or practical) reasoning, learners have to express their judgements in accordance with the lexicon and protocols associated with, what SEELY/BROWN/DUGUID (1991) refer to as, 'canonical practice', in other words, expectations within an occupational community of practice about how to form a judgement and talk about and act on that judgement. Here the lexicon and protocols remain an implicit part of the occupational practice and learners gradually pick them up through agentic engagement with participatory practices.

These challenges initially appear to be associated with boundary crossing between education and work and, moreover, this view has been reinforced by some extremely interesting and insightful research which has been undertaken by BAKKER AND COLLEAGUES (BAKKER/DERRY, 2011; BAKKER/AKKERMAN, 2014; BAKKER et al. 2014, BAKKER/BEN-ZVI/MAKAR, 2017) centred on the concept of inference as a way to facilitate vocational learners to boundary cross between education and work via work placement. VAN OERS' (1998) original argument about the recontextualisation of knowledge and practice implies however, as I noted earlier, a more unbounded or con-

tinually progressive perspective on the process of recontextualisation, in other words, knowledge is used in different ways in different contexts. As a consequence, BRANDOM's idea about inference also imply that the social practice of giving and asking for reasons is also an unbounded process that occurs throughout a working life.

To illuminate this conceptual issue, I have distinguished between the following – *content, pedagogic, workplace, learner* and *further* – expressions of recontextualisation (GUILÉ, 2010, p. 154–160). The first reveals the constructed nature of curricula in two senses: the way in which the parties, for example, universities, professional associations, involved in curriculum planning, formulate criteria to select which aspects of the forms of knowledge, for example, disciplinary, professional/legal, work-based, should be included and sequenced in vocational curricula, and then how those and other parties accord different status to curricula. The classic example being the privileging of academic over vocational curricula. The second expression of recontextualisation refers to the pedagogic decisions that lecturers take about how to teach the diverse range of concepts contained in a vocational curriculum so learners can develop the capability to reason theoretically in the context of both education, and to prepare them to engage in vocational reasoning in the context of work (see GUILÉ, 2014; 2018 for different accounts of the complexity of pedagogic recontextualisation). The third – workplace recontextualisation – refers to the way in which people working in organisations have already embedded and continue to embed knowledge and skill in different ways in different contexts.

One way to illustrate this issue is to revisit the explanation I provided of the *workplace recontextualisation* of pharmacology as pharmacy students undertook a work placement (GUILÉ, 2014). Pharmacology consists of a number of sub-areas. One area is Systemic Pharmacology, that is, the action of drugs on physiological systems. Student pharmacists are taught Systemic Pharmacology to assist them to understand the pharmacological basis of medicines and the way in which drugs affect biological systems, so they can when in professional practice assess the benefits that arise from one drug compared with another one as well as anticipate Adverse Drug Reactions (ADRs) or idiosyncratic reactions that may occur. When undertaking work placements as part of their Pharmacy Degree, student pharmacists, supported by experiences pharmacists and mentors, draw on their growing pharmacological understanding and experience of dealing with patients, to make the following types of judgement. The first is to infer based on a patient's description of their condition which medicines might be appropriate. The second is to infer the likely effect of the medicine they intend to recommend on a patient. The third is to make a final decision as to which medicine they will recommend. Student pharmacists are therefore, like the engineers we saw above, engaged in a process of recontextualising their theoretical knowledge in relation to their practical experiences. Consequently, the judgement they make about which medicine is appropriate for a particular patient may vary from one patient to another who is exhibiting a similar condition. Forming judgements is therefore the outcome of a process of infer-

ring; it is a radically different type of activity compared with the widespread tendency in VET of referring to work placements as an opportunity to ‘apply’ theory to practice.

The fourth expression of recontextualisation refers to the different ways in which learners embody the form of knowledge they encounter in their curriculum or in the workplaces when undertaking a work placement, and the different ways they are expected to express and convey those forms of knowledge in the contexts of education and work, as acknowledged above. The final expression – further recontextualisation – refers to the ‘lifelong’ process of using knowledge and skill in different ways in different workplace contexts. For reasons of space, it is not however possible to offer a fuller explanation of this process.

Diagram 1. reflects the progressive recontextualisation of knowledge and practice described above. It depicts the ways in which a) extant forms of knowledge have been embedded in curricula and workplace routines as well as embodied by learners, and ultimately vocational/professional experts, and b) new workplace knowledge and practice can be recontextualised by becoming part of an extant curriculum, for example, in the form of case studies, on-line access to professional institute’s databases or a resource vocational experts use as they participate in new work contexts with the same or a different employer.

The Continuous Recontextualisation of Knowledge and Professional and Vocational Practice

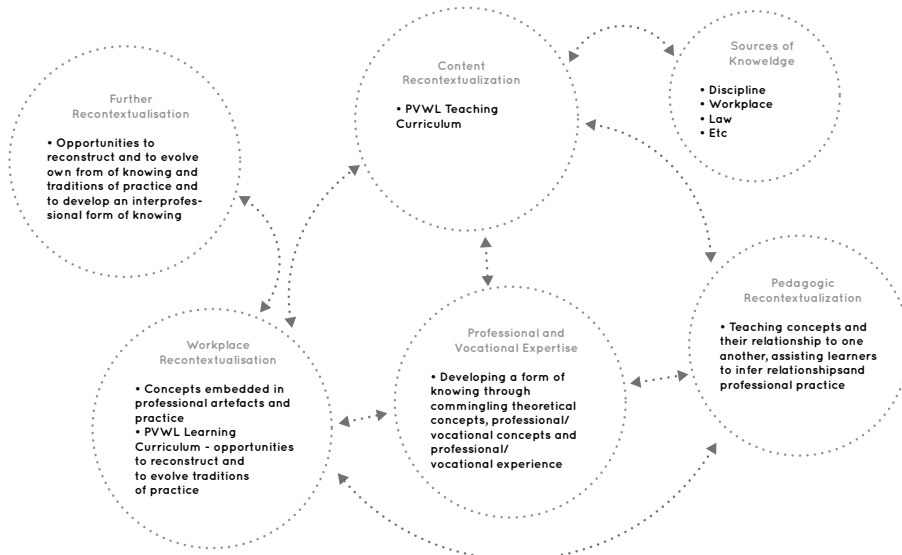


Fig. 1 The Continuous Recontextualisation of Knowledge and Practice, (GUILÉ, 2014)

4 Continuous recontextualisation of knowledge and practice: contexts and capabilities

The argument running throughout the contribution is that boundary crossing – expressed in the lexicon of the contribution as the continuous recontextualisation of knowledge and practice – is a ubiquitous feature of professional and vocational education, rather than a back and forth movement between different contexts as BEACH (1999) initially indicated, and has generally been the case in Vocational Education (see APREA & CATTANO, 2019 for an example of how IT can be used to avoid viewing boundary crossing as a back and forth issue). This conclusion implies that the challenge for vocational (or professional) education is to prepare learners to develop the capabilities to continuously recontextualise their own knowledge and practice, and to work with others to recontextualise their knowledge and practice, in a variety of contexts. It also implies, as we shall see below, that workplaces have a similar responsibility in two senses: to offer work placements as part of programmes of vocational/professional formation, and to offer support to their own staff to further develop their capabilities to continuously recontextualise their own knowledge and practice.

The role of vocational education is, in the first instance, to prepare learners to recontextualise knowledge and skill within a specific occupational community of practice. There has, however, been rising evidence for some time that work is increasingly organised around project teams, in other words, inter-occupationally. This trend is therefore likely to result in pressure on vocational education to prepare learners to recontextualise knowledge and skill within inter-occupational communities of practice, and there is some evidence in apprenticeship in some sectors that learners/apprentices are already being prepared to work in such communities of practice (FULLER/UNWIN, 2012; GUILÉ/LAHIFF, 2017).

The concept of recontextualisation offers all parties involved with vocational education a way to think holistically about how to develop learners' capabilities to operate effectively in occupational and inter-occupational communities of practice. The reason the concept has this generative quality is, once we appreciate that the object of activity influences the mode of recontextualisation, for example, content, pedagogy, workplace, it becomes possible to see the continuing relationship between the development of the capability to reason: (i) theoretically and vocationally in programmes of vocational education, and (ii) vocationally in occupational and inter-occupational communities of practice.

The unifying thread between these forms of reasoning is the social practice of giving and asking for reasons. Participating in this social practice assists learners on vocational programmes to firstly, grasp the meaning of, and relationship between, concepts and to express their understanding in written and oral forms in accordance with disciplinary conventions, warrants and modes of assessment. Secondly, commingle their disciplinary understanding and vocational experiences to develop a vocational form of

knowing and reasoning. Viewed from the perspective of vocational experts, participating in the social practice of giving and asking for reasons, enables them to explicate the judgements they make both orally and textually in accordance with their vocational conventions and standards to members of the same occupational community of practice. These judgements are however situated accomplishments based on vocational experts' recontextualising their form of knowing to one another. The conventions and standards that underpin forms of knowing are, however, unlikely to be shared when working inter-occupationally. The continuing challenge therefore for vocational experts is therefore two-fold: to make the reasoning that lies behind their judgements intelligible to other participants who do not share the same frame of reference (GUILLE, 2011); and, to pave the way for a vocational expert in another occupation to recontextualise that judgement in relation to their own conventions and standards and infer how to respond.

Table 2. is a first attempt to articulate the ideas discussed above in ways that all parties involved with vocational education and learning throughout the life-course may use to re-design vocational programmes and workplace support for vocational and inter-vocational exchange and collaboration. The table is constructed as follows. It distinguishes between, in the horizontal column, the capabilities of the vocational learner and vocational expert; and, in the vertical column, the context where they deploy those capabilities. Four contexts are identified: the educational context where vocational learners are taught and the work context where they undertake their work placement; and, the occupational community of practice context where the vocational expert first gained their expertise and the inter-occupational context where they might already be or may be required to operate in future.

Tab. 2 Vocational contexts and capabilities: initial and continuous recontextualisation

Vocational learner	Context of education	Context of work
Capabilities	Reasoning theoretically by inferring connections between concepts, and relationship between concepts and vocational practice. Expressing theoretical and vocational reasoning in accordance with academic code.	Commingle practice and theory into a vocational form of knowing, and inferring from that form of knowing how to reason in vocationally-specific situations. Expressing vocational reasoning in accordance with occupational and organizational lexicon.
Vocational expert	Occupational CoP context	Inter-occupational CoP context
Capabilities	Using and developing vocational form of knowing to infer how to solve problems and communicate with similar vocational experts.	Sharing vocational form of knowing with other experts so they can infer what follows for them, and <i>vice versa</i> .

5 Conclusion

This contribution has argued that boundary crossing is a ubiquitous feature of the design and delivery of vocational and professional education and vocational and professional practice throughout the life-course, rather than an issue of learners crossing the boundary (material or symbolic) between education and work. It has introduced the concept of recontextualisation and five expressions of that concept – content, pedagogy, workplace, learner and further – to illustrate the initial contribution that vocational education plays in positioning a learner to develop the capabilities to boundary cross in order to succeed academically and vocationally (see Table 2.). The contribution then illustrated that as vocational learners become vocational experts, with their distinctive vocational form of knowing, they might be positioned to work with vocational experts from other occupational fields. This means vocational experts would have to develop the capability to share their form of knowing and respond to others' form of knowing. The contribution highlighted that the unifying thread through the movement from vocational learner to vocational expert is the capability to infer by engaging in the social practice of giving and asking for reasons (see Table 2.)

Finally, one aspect of the above argument that remains rather under-developed is the role of artefacts, specifically, workplace digital artefacts in contributing to the development of the capabilities identified in Table 2. This is a pressing issue for further research not only in my own work, but also in the field of vocational education, because the global investment in 4th generation technologies or robotics is creating sophisticated artefacts (see BRYNJOLFSON/MCAFEE, 2014; FORD, 2015) that will rapidly become part of vocational learners and experts operating environments. And, this is a very different from the widely discussed issue of supporting learners to use mobile digital technologies to recontextualise their knowledge and learning for the purposes of accreditation (GUILÉ, 2018).

References

- AINLEY, P. / RAINBIRD, H. (1999) (Eds.). *Apprenticeship: A New Paradigm of Learning*. London: Kogan Page.
- AKKERMAN, S. F. / BAKKER, A. (2011). Boundary crossing and boundary objects. *Review of Educational Research*, 81(2), 132–169.
- AKKERMAN, S. F. / BAKKER, A. (2012). Crossing boundaries between school and work during apprenticeships. *Vocations and Learning*, 5(2), 153–173.
- APREA, C. / CATTANEO, A. A. P. (2019) Designing Technology-Enhanced Learning Environments in Vocational Education and Training. In L. UNWIN, L. / D. GUILÉ (Eds.), *The Handbook of Vocational Education and Training*, (pp. 373–393). New York: Wiley.

- BAKKER, A. / AKKERMAN, S. F. (2014). A boundary-crossing approach to support students' integration of statistical and work-related knowledge. *Educational Studies in Mathematics*, 86 (2), 223–237).
- BAKKER, A. / GROENVELD, D. / WIJERS, M. / AKKERMAN, S. F. / GRAVEMEIJER, K. P. E. (2014). Proportional reasoning in the laboratory – An intervention study in vocational education. *Educational Studies in Mathematics*, 86(2), 211–221.
- BAKKER, A. / DERRY, J. (2011). 'Lessons from inferentialism for statistics education.' *Mathematical Thinking and Learning*, 13(1), 5–26.
- BAKKER, A. / BEN-ZVI, D. / MAKAR, K. (2017). An inferentialist perspective the coordination of actions and reasons involved in making a statistical inference. *Mathematics Education Research Journal*, 29(4), 455–470.
- BEACH, K. / VYAS, S. (1999). Light Pickles and Heavy Mustard: Horizontal development among students negotiating how to learn in a production activity. Paper presented at the *Fourth Conference of the International Society for Cultural Research and Activity Theory*, June 1999 University of Aarhus, Denmark.
- BEACH, K. (1999). Consequential transitions: A sociocultural expedition beyond transfer in education. *Review of Research in Education*, 24, 101–139.
- BELL, D. (1973). *The Coming of the Post-Industrial Society*. New York: Basic Books.
- BILLET, S. (2001). *Learning in the Workplace*. Sydney: Allen and Unwin.
- BOUD, D. / KEOGH, R. / WALKER, D. (1985). *Reflection: Turning Experience into Learning* Abingdon: Routledge.
- BRANDOM, R. (2000). *Articulating reasons: An introduction to inferentialism*. Cambridge, MA: Harvard University Press.
- BRYNJOLFSON, E. / MCAFEE, A. (2014). *The Second Machine Age*. New York: Norton.
- CASTELLS, M. (2000) *The Network Society* Volume 1. Blackwell: Oxford.
- EASTERBY-SMITH, M. (2005) (Ed.). *Handbook of Organizational Learning and Knowledge Management*, 2nd Edition. Chichester, UK: Wiley.
- EUROPEAN UNION (2000). *A Memorandum on Lifelong Learning*. Brussels: European Commission.
- EVANS, K. / HODKINSON, P. / UNWIN, L. (2002) (Eds.). *Working to Learn. Transforming Learning in the Workplace*. London: Kogan Page.
- FORD, M. (2015). *The Rise of the Robots: Technology and the Threat of Mass Unemployment*. New York: Basic Books.
- FULLER, A. / UNWIN, L. (2012) *Contemporary Apprenticeships: International Perspectives on a Evolving Model of Learning*. Routledge. Abingdon.
- GRIFFITHS, T. / GUILLE, D. (2004). *Learning through work experience for the knowledge economy*. Thessaloniki: CEDEFOP.
- GUILLE, D. / AHAMED, F. (2011). *Modernising the Undergraduate Pharmacy Curriculum*. LLAKES Research Paper 26. ESRC Research Centre Learning and Life Chances in Knowledge Economies and Societies, Institute of Education, University of London.
- GUILLE, D. / LAHIFF, A. (2017). Apprenticeship for 'Liquid Life': Learning in Contingent Work. Conditions for Contingent Employment, *Vocations & Learning*, 10(2), 157–175.
- GUILLE, D. (2010) *The Learning Challenge of the Knowledge Economy*. Rotterdam: Sense.
- GUILLE, D. (2011a). Apprenticeship as a model of vocational 'formation' and 'reformation': the use of Foundation Degrees in the Aircraft Engineering Industry, *Journal of Vocational Education and Training*, 63(3), 451–464.

- GUILÉ, D. (2011b). Interprofessional working and learning: objects, reasons and expertise. *Mind, Culture & Activity*, 18(4), 342–364.
- GUILÉ, D. (2018). Professional knowledge and professional practice as continuous recontextualisation: a social practice perspective. M. YOUNG / J. MULLER (Eds.), *The Professions and Expertise*, (pp. 78–93). London: Routledge.
- GUILÉ, D. (2018). Work experience and VET: insights from the connective typology and recontextualisation model. In S. CHOY / G-B. WÄRVICK / V. LINDBERG (Eds.), *Integration of Vocational Education and Training Experiences. Purposes, Practices and Principles*, (pp. 41–61). Singapore: Springer.
- GUILÉ, D. (forthcoming). Knowledge, expertise and engineering: a ‘recontextualisation’ perspective.
- KOLB, D. (1984). *Experiential Learning*. Englewood Cliffs: Prentice Hall.
- LAVE, J. (1988). *Cognition in Practice: Mind, Mathematics and Culture in Everyday life*. Cambridge: Cambridge University Press.
- LAVE, J. / WENGER, E. (1991). *Situated learning: legitimate peripheral participation*. New York: Cambridge University Press.
- LEONT’EV, A. N. (1978). *Activity, Consciousness and Personality*. Prentice Hall. New Jersey.
- MILLER, A. / WATTS, A. G. / JAMIESON, I. (1991) (Eds.). *Rethinking Work Experience*. Brighton: Falmer Press.
- NONAKA, I. / TAKEUCHI, H. (1995). *The Knowledge Creating Company*. New York: Oxford University Press.
- RAINBIRD, H. / FULLER, A. / MUNRO, A. (2004) (Eds.). *Workplace Learning*. London: Taylor and Francis.
- SÄLJÖ, R. (2009) Learning, theories of learning, and units of analysis in research. *Education. Psychologist*, 44 (2), 202–208.
- SEELY BROWN, J. / DUGUID, P. (1991). Organizational Learning and Communities-of-Practice: Toward a Unified View of Working, Learning, and Innovation. *Organization Science*, 2(1), 40–57.
- SFARD, A. (1998). On two metaphors for learning and the danger of choosing just one. *Educational Researcher*, 27(2), 4–13.
- SPENDER, J. C. / GRANT, R. (1996). Knowledge and the Firm. *Strategic Management Journal*, 17, 1(3), 5–9.
- STEHR, N. (1994). *Knowledge Societies*. London: Routledge.
- TUOMI-GRÖHN, T. / ENGSTRÖM, Y. (2003) (Eds.). *New perspectives on transfer and boundary crossing*. Amsterdam: Elsevier.
- VAN OERS, B. (1998). The fallacy of decontextualization. *Mind, Culture and Activity*, 5(2), 135–142
- WEBER, M. (1949). *Max Weber on the methodology of the social sciences*. Glencoe: The Free Press.
- WELLS, G. (1999). *Dialogic inquiry: Towards a sociocultural practice and theory of education*. Cambridge: Cambridge University Press.
- WERTSCH, J. (1985). *Vygotsky and The Social Formation of Mind*. Cambridge: Cambridge University Press.

David Guile

UCL – Institute of Education, Department of Education, Practice & Society (EPS),
20 Bedford Way, London WC1H 0AL, United Kingdom; d.guile@ucl.ac.uk