

Chapter 10: A typology of occupational teachers' capacities across the three academic levels [7645 inclusive]

Dr Sai Loo, UCL Institute of Education, University College London, England. E-mail: sai.loo@ucl.ac.uk

Abstract

This chapter focuses on the pedagogic activities of teachers, who are involved in professional or work-related provisions. It uses a dual professionalism concept at the initial stage (Handal, 1999) to investigate how teachers acquire and apply their teaching know-how or capacities from curriculum development to teaching strategies. The study of the acquisition of knowledge relies on concepts by Clandinin (1985), Shulman (1987), Becher (1994) and Bernstein (1996). The understanding of the application of know-how refers to theories by Eraut (2004), Evans et al. (2010), Loo (2014) and Winch (2014). In particular, recontextualization processes are used to understand the acquisition and application of the teachers' capacities. In so doing, a list of contextual activities is ascertained from the various recontextualization processes. These activities are derived from the teachers' pedagogic activities across three academic levels and varied disciplines. Thus this chapter offers development of these analysed descriptive narratives and metaphors culminating in a typology of these teaching activities.

The empirical data is from a project (Loo, 2018), which investigates the types of teaching and learning using forms of recontextualization to understand how certain forms of knowledge such as occupational, disciplinary and pedagogic are acquired and applied in teaching contexts. The participants teach on pre-university or technical and vocational education and training (TVET), first-degree or higher vocational and professional education. The disciplines of these teachers include gas fitting, equine studies, fashion and textiles and airline studies at the TVET level, dental hygiene and accountancy at the higher vocational level, and the training of doctors and Emergency Medicine clinicians at the professional level. There are 21 participants in total with seven from each of the three academic levels. The empirical data is drawn from a questionnaire survey and semi-structured interviews and supporting documents such as curriculum specifications.

The findings from the analysed empirical data offer insights into how the teachers acquire and apply their pedagogic and professional know-how. Occupational knowledge refers to the teachers' professional practices in their disciplines such as airline studies and accountancy, which are used in their teaching practices. The findings also provide additional insights into how the teachers' capacities/know-how are selected and relocated – recontextualized - for use in the different teaching contexts and technical provisions that they deliver. In so doing, these activities offer a typology of the different recontextualization processes about the teaching activities over the three academic levels. This typology, drawing from the different classifications of the literature review and analysed empirical data, contributes to a greater understanding of how teachers with professional practices rely on and apply their pedagogic and professional experiences to facilitate their teaching of work-related programmes. It offers different forms of disciplinary knowledge that the teachers refer to and how they make it relevant to their particular discipline. Additionally, the typology points to the symbiotic relationship between teaching and

professional practices, the reliance on real-life experiences as well as the appropriate teaching strategies that are employed in education. The findings have implications for occupational teachers, managers of work-related provisions, teacher educators and policymakers.

Introduction

This chapter investigates the perspectives of teachers who are involved in occupation-related programmes across the three academic levels of pre-university, higher and professional education. ‘Occupational teaching’ may be defined as the “teaching of work-related courses where there is a duality of pedagogic and occupational/work-related practices and experiences, and academic teaching, i.e. where its immediacy is related to disciplinary/theoretical knowledge and not necessarily to occupational pathways, co-exist. The occupational teaching has immediate relevance to work-related experiences and practices whereas the academic teaching has less obvious work connections such as accreditation pathways to related occupations for the former and not necessarily the latter” (Loo, 2018, p. 4). Occupational teaching is the focus of this chapter, and it includes teaching across the academic levels of technical and vocational education and training (TVET), higher vocational/first-degree and professional education. In some countries like the United Kingdom and Australia, TVET may also be known as vocational education and training (VET), which are pre-university offers. TVET is used to denote an international perspective (UNESCO, 2012) rather than the ‘English context’ which is associated with the socio-cultural baggage of the ‘academic-vocational’ divide and its associations relating to class, parity of esteem and disadvantaged groups in England (Loo and Jameson, 2017).

This chapter follows on from an empirically based project (Loo, 2018). It investigated the types of teaching and learning using the different forms of recontextualization and “the types and applications of know-how leading up to the occupational teachers’ capacities”, which had the beginnings of a typology (Loo, 2018, p. 118). This chapter refers to these pedagogic activities of recontextualization across the three academic levels of occupational provisions and develops the capacities further to ascertain a typology. The purpose of the typology classification is to offer greater insights into how teachers on the occupational programmes who have work-related experiences (in addition to pedagogic experiences) utilise varied sources, types and functionalities of their know-how. A teacher’s capacities, for this chapter, is defined eclectically to include, knowledge, pedagogic, occupational and relevant life experiences, a teacher’s abilities, capabilities, dispositions, judgement, skill sets and techniques. This chapter refers to empirical examples of the teachers’ know-how to form a typology of the recontextualized activities. The typology is drawn from the classifications of the literature review and analysed empirical data via the recontextualization processes.

The chapter has five sections. Following the introduction, the next section discusses the relevant theoretical frameworks, which draws on knowledge classifications and recontextualization processes. The third section offers details of the project and is followed by a discussion of the pedagogic examples by teachers in the three academic levels. The conclusion section provides a summary of the investigation, contributions and implications for the stakeholders: teachers, managers and teaching institutions, and policymakers.

Literature review

This section is divided in the following manner. Bernstein's recontextualization concept is delineated along with the relevant processes. This approach is to structure this literature review, and the section on findings and discussion as the creation of a typology of these recontextualization processes is the main aim. Next are the types and sources of teaching knowledge that is required and followed by the applications of the know-how. The delineations of these conceptual frameworks would offer the appropriate classifications in the typology of the teachers' pedagogic activities.

The complexity of this study of occupational teaching by teachers with their professional/occupational practices and experiences begins with an acknowledgement of an initial notion of 'dual professionalism' (Peel, 2005). These teachers carry out their pedagogic activities in their work-related programmes and have professional experiences of practising in the related occupations. This study acknowledges the significance of knowledge and that Bernstein offers a pedagogical perspective of acquiring, using and evaluating teaching knowledge. Bernstein argues that the 'distributive rules', 'recontextualizing rules' and 'evaluative rules' govern these pedagogic activities. The distributive rules concern the 'what' regarding knowledge. They "regulate the relationships between power, social groups, forms of consciousness and forms of practice to social groups" (Bernstein, 1996, p. 42). The recontextualizing rules refer to the 'how' knowledge is used for teaching. The principle behind recontextualization refers to the selective appropriation, relocation, refocus and relation with other discourses to constitute its order (Bernstein, 1996). The "evaluative rules constitute any pedagogic practice" (Bernstein, 1996, p. 43). This section focuses on the 'how' to understand the ways that teaching know-how concerning occupational provisions.

For Bernstein (1996), recontextualizing rules govern the selection, relocation, refocus and relations with vertical discourse or knowledge. Vertical discourse is defined as "coherent, explicit, systematically principled structure, hierarchically organised, *or* it takes the form of a series of specialised languages with specialised modes of interrogation and specialised criteria for the production of texts" (Bernstein, 1996, p. 171). For Bernstein (1996), there are two types of vertical knowledge: hierarchical knowledge structure (e.g. knowledge of physics and mathematics) and horizontal knowledge structures (e.g. knowledge of the humanities and social sciences).

This recontextualization notion is helpful as it offers insights into how an aspect of an occupational curriculum (e.g. gas fitting, dental hygiene and emergency medicine) may be selected for used in a specific occupation that is appropriate at that academic level and for that professional context.

Post-Bernsteinian researchers have offered various types of recontextualization processes. Barnett (2006), using work-related programmes, recognises reclassificatory and pedagogic recontextualization processes. For Barnett (2006, p. 147), the first type refers to a "toolbox of applicable knowledge" and the strategies governing professional practices and the second relates to how disciplinary knowledge (e.g. physics and biology) is needed to be modified and related to the specific occupation for teaching purposes. In so doing, Barnett links the recontextualization processes to the teaching of work-related programmes as a two-stage process of learning. However, Barnett's explanation of his two recontextualization processes is scant. For a more expansive delineation, we turn to Evans, Guile, Harris and Allan (2010). They

offer four types of recontextualization processes from the learners' perspectives in work-related offers such as aircraft engineering. They are content, pedagogic, workplace and learner. Content recontextualization is when explicit or codified knowledge (e.g. disciplinary, procedural and work processes) is selected and recombined for use in curriculum and teaching activities. Pedagogic recontextualization refers to how this selected knowledge is applied in teaching, and workplace recontextulization relates to the use of know-how in the workplace. Learner recontextualization concerns the ways that a learner uses different ways of acquiring the know-how for work purposes. They offer greater insights into how the four types of recontextualization may apply in teaching and work contexts. Their wider definitions of know-how of codified disciplinary and work-related knowledge, and tacit varieties, skills and capabilities provide greater intellectual possibilities of viewing knowledge. Loo (2012) focuses on the acquisition and application of know-how from a teacher's perspectives of work-related programmes. He identifies five complexities in understanding occupational pedagogy such as the types of knowledge associated with non-teaching occupational practices, the pedagogic contexts of academic levels, learner types, subjects, programmes and teaching cultures, and the teacher education routes. The fourth complexity relates to the continuous professional development of this dual professional practice and the combination of the four complexities in understanding occupational pedagogy. His identification of these pedagogic complexities enables researchers to understand how recontextualization processes may be further related to teaching. Loo (2014, p. 352) suggests 'ongoing recontextualization' as one which involves "disciplinary knowledge between subject areas and between disciplinary/theoretical knowledge and every day (tacit) experiences". The explication of explicit and tacit knowledge is useful as it acknowledges the relationship between the two varieties of know-how, which Bernstein ignored. Loo also acknowledged that in any recontextualizing process, the related know-how would be changed or modified as a result of its selection, refocus and relocation, i.e. recontextualization process. This modification of knowledge resides in the perceptions of the users. So, an occupational teacher of Emergency Medicine views the skeleton from the perspectives of her/his specific clinical experiences and in Emergency Medicine practices and not purely from an anatomical perspective. This ongoing modification of the know-how becomes part of the user (practitioner and teacher), and one can argue it may become second nature to the user. The ongoing process also affects how one views the explicit and tacit natures of knowledge, the nature of the know-how from a collaborative or individualistic standpoint and its trajectory from one type of know-how to another. Research by Nonaka and Takeuchi (1995) is pertinent to this perspective as it offers the ways in which explicit and tacit knowledge forms are combined and re-combined for use in work activities.

The above forms of recontextualization processes are used to conceptualise a theoretical framework of the occupational pedagogy of these teachers. Drawing from Evans et al.'s (2010) content recontextualization, the related know-how may be used for two practices. Using the dual professionalism (Peel, 2005) as a starting guide, there are two varieties of content recontextualization. The first relates to teaching where know-how is used to develop a curriculum, and the second refers to specifications for occupational practice in a specific profession such as gas fitting or dental hygiene. The know-how is more likely to be associated with knowledge of the disciplines such as sociology and business management for teaching purposes like

learning theories. The know-how from a Bernsteinian perspective may be viewed as horizontal knowledge structures. This type of content recontextualization relates to the form of vertical knowledge known as horizontal knowledge structures.

Turning to the second type of content recontextualization, the disciplines for occupations may be disciplines of biology, physics and mathematics (Becher, 1994; Smeby, 1996). These forms of theoretical or vertical knowledge are “coherent, explicit and systematically principled structure” (Bernstein, 1996, p. 171) and are known as hierarchical knowledge structures, a form of vertical knowledge. Becher (1994) refers to these as hard-pure disciplines with resonances to Bernstein’s hierarchical knowledge structures. These are used to create content in a curriculum/specification. From a teaching perspective, via content recontextualization, the disciplinary knowledge is modified, relocated and refocused for teaching in a specific work-related programme such as equine studies. From an occupational perspective, this know-how is modified in a different manner that is suitable for occupational practice. In both cases, the disciplinary know-how undergoes a modification. Terms like ‘relevant to the profession’ may be linked to this process. Loo (2012, 2014) suggests that the process changes the nature of the knowledge and it becomes something else for the user. The two forms of recontextualized knowledge may be known as pedagogic and occupational knowledge respectively.

The curriculum development stage undergoes another modification – pedagogic recontextualization - for teaching purposes. Specific parts of the content are chosen for teaching purposes. Aspects of teaching know-how such as academic level, knowledge of learners, teaching institutional procedures, teacher’s vision, teacher’s occupational and life experiences (Clandinin, 1985; Shulman, 1987; Verloop, Van Driel and Meijer, 2001; Loughran, Mitchell and Mitchell, 2003; Loo, 2012) are also required. Some of the teaching know-how may be explicit or tacit (Polanyi, 1966; Nonaka and Takeuchi, 1995; Collins, 2010). Additionally, ‘work knowledge’ is also required as it refers to the procedures, protocols and systems of the teaching organisation (Evans et al., 2010). Together, these knowledge types enable the teacher to relocate and modify the teaching knowledge for a targeted session in a specific occupational programme. These knowledge types after recontextualization become applied pedagogic knowledge.

A similar process happens for occupational practices where forms of occupational and work knowledge of procedures, skills, techniques, transversal abilities, project management abilities, personal capabilities and occupational awareness (Clarke and Winch, 2004; Eraut, 2004; Hager, 2004; Winch 2014) are required for the occupational recontextualization process. The modified know-how becomes applied occupational knowledge.

For an occupational teacher, the pedagogic and occupational know-how is then combined via the integrated applied recontextualization (IAR) process to form occupational pedagogic knowledge where teaching strategies may be chosen to teach a session of an occupational offer. The choice or choices of strategies available can be elucidated in sources such as Lucas, Spencer and Claxton (2012), Huddleston and Unwin (2013), and Fry, Ketteridge and Marshall (2014). The first two sources offer a comprehensive listing of teaching strategies in the FE sector (i.e. TVET). The final

reference provides disciplinary-related teaching strategies in the higher and professional education. This theoretical framework of the occupational pedagogy of a teacher offers deep insights into how forms of teaching know-how including that of a teacher's occupational practices be acquired and applied to an eventual pedagogic session of an occupational programme. The delineation of this framework offers a structure of classifying the professional practices using empirical findings in the penultimate section.

Project details

The empirical data comes from a project, which has the related research questions: 1. What is occupational pedagogy? 2. How is its related knowledge acquired and applied by those teaching on the programmes? (Loo, 2018). 'Occupational pedagogy' is used to denote teaching and learning across the academic levels of vocational/TVET, higher vocational/first-degree, and professional education. This chapter draws on all the 21 purposive participants in the three levels with seven from each of the levels. The salient details of the participants are indicated in appendices - Table 1. The research methods included a questionnaire survey, semi-structured interviews and documentary search. The survey offered details such as gender, age, pedagogic, occupational and relevant life experiences, and academic and occupational/professional qualifications, following a pilot study. The interviews captured data related to the participants' sources, types and applications of their teaching know-how. The documentary evidence, such as programme specifications, was amassed to triangulate data with the other two sources. The data is analysed using generated codes, identified phrases, patterns, and themes. In addition to thematic analysis, a narrative analysis (Robson, 2002) is also applied where the participants' narratives are used to delineate their pedagogic activities. Included in this analysis are metaphors and analogies. Narratives are employed, even though they are taken for granted in research because they capture the insights and nuances of teachers that are pertinent to this project. In so doing, the data capture the articulations, metaphors and symbolic representations of their sense of selves and their professional actions (Cameron, 2008). These articulations also capture the pedagogic processes of simplifying and clarifying complex ideas to themselves and their learners (Bullough and Stokes, 1994) and their contestations (Volkman and Anderson, 1998). The teachers' use of narratives and especially metaphors serve as a means of understanding and making coherent (Lakoff and Johnson, 1980) their occupational experiences to their pedagogic activities. These analytical findings are then further developed to create a typology from the two dimensions: the recontextualization processes and the three academic levels of provisions (Appendix – Figure 1).

Discussion

This section offers examples of the recontextualization processes of occupational teachers across the three academic levels of work-related programmes. As with the literature review section, the ordering of the recontextualization processes starts with examples of the content recontextualization of teaching and occupational practices and is followed by pedagogic and occupational recontextualization examples and finally examples of the integrated applied recontextualization. The literature reviews carried out earlier were then employed to assist in the structuring of this typology.

Content recontextualization (Evans et al. 2010) refers to the modification of explicit and tacit knowledge. Explicit knowledge identified by Becher (1994), Bernstein

(1996) and Smeby (1996) offer possible classification structure of codified knowledge. Bernstein's (1996) distributive rules of pedagogic device distinguish vertical and horizontal discourses or knowledge. Bernstein argues that only vertical discourse can be recontextualized i.e. selected, relocated and refocused. The vertical and horizontal discourses are immutable. The vertical discourse is divided into hierarchical knowledge structure (which is "systematically principled structure and hierarchically organised" such as physics and mathematics), and horizontal knowledge structures (which are a "series of specialised languages with specialised modes of interrogation" such as the humanities and social sciences) (Bernstein, 1996, p. 171). The former type of vertical knowledge is similar to the hard-pure variety identified by Becher (1994) and Smeby (1996), which they also termed natural sciences. Participant OP1 (Table 1) refers to this variety as "basic knowledge of physics, mathematics, and chemistry" in his teaching of gas fitting provisions at the TVET level. The latter type of vertical knowledge is exemplified by OP2's description of the use of 'behavioural management concepts' in health and social care programmes. A detailed explanation of Bernstein's vertical and horizontal discourses is located on pages 19 – 24 of the *Teachers and Teaching in Vocational and Professional Education* (Loo, 2018).

From the recontextualization rules perspective, Bernstein did not distinguish the possible forms of this process but referred to the recontextualizing of vertical discourses. By inference, he might be referring to Evans et al.'s content recontextualization where 'disciplinary' knowledge is selected, relocated and refocused for pedagogic purposes. Post-Bernsteinian researchers such as Evans et al. (2010) and Loo (2014, 2018) do not necessarily adhere to Bernstein's immutability of the vertical and horizontal knowledge in recontextualization. For them, vertical or explicit and horizontal or tacit (to put these in simple terms) may be involved in the recontextualization process. For Bernstein (1996), the two forms of vertical knowledge after recontextualization may be modified into three possible modes: singulars, regions and generic mode. Singulars are bodies of knowledge that are usually associated with academic disciplines such as physics and psychology. Regions are derived from recontextualizing singulars into units such as those found in engineering and medicine. The occupational areas from this investigation might have traction in this region mode of recontextualization. They include accountancy, dental hygiene, Emergency Medicine, and General Medicine. These occupations use hierarchical knowledge structures such as mathematics, biology, anatomy, and psychology in teaching. OP9, a teacher of dental hygiene, refers to the need to have a "wider knowledge of biology (from nursing)."

The teachers via content recontextualization have to select, refocus and relocate the hierarchical knowledge structures to make them relevant to the specific occupational studies. The teachers also use knowledge from the other disciplines such as psychology, sociology and management to relate pedagogic content knowledge to teaching. Examples include OP13's use of Skinner learning theory for rote learning in her teaching of accountancy and OP19's description of her reference to the spiral curriculum in her teaching of undergraduate medical education. Generic mode is not necessarily reliant on academic or applied academic disciplines, unlike the other two modes. This mode can be competency and function-related such as TVET provisions in the FE sector. Examples of these from the project include airline studies, equine studies, and fashion and textiles. For a detailed explanation of the recontextualization

modes, please refer to pages 32 – 34 of the *Teachers and Teaching in Vocational and Professional Education* (Loo, 2018).

Turning to another form of knowledge for possible recontextualization (and thus moving away from Bernstein's immutability concept of vertical and horizontal knowledge), we look at the tacit variety of knowledge (Polanyi, 1966; Nonaka and Takeuchi, 1995; Collins, 2010). Polanyi's variety is related to the sciences whereas Collins's varieties are societal-related of the relational and somatic varieties. The relational type is associated with someone who is not aware of another person's lack of awareness of the know-how, and the somatic variety refers to an unexplainable but conscious facility such as riding a bicycle. Concerning the collective versions, Collins views tacit knowledge at a community or societal level whereas Nonaka and Takeuchi, it is a business-oriented variety where people apply their tacit experiences for the production of goods and services. OP15, who worked as a general practitioner and currently teaching on a medical education programme indicated that explicit and tacit knowledge is needed where her GP experience helped in her teaching of medical students. OP14, a dental therapy teacher, indicated that she remembered what she used and "developed more of understanding when applying them." For OP14, the acquisition and practising of her know-how become "second nature" to her eventually. This initial conscious nature of know-how, which becomes second nature (somatic) after numerous applications offers an example of Nonaka and Takeuchi's journey-making from one type of know-how to another. The statement also illustrates Loo's (2014) ongoing recontextualization where the knowledge modifies and morphs into different forms of understanding. The user views this know-how differently after recontextualization. The collective aspects of Emergency Medicine practice were recounted by OP20. He worked as a surgeon and in accident and emergency. He referenced his tacit knowledge as being part of a team and his use of "real-life patients feedback." This tacit variety is more related to the sciences in clinical medicine (Polanyi 1966), and the collective team learning is of Collins's (2010) typology.

The final category of knowledge that is not discussed by the related researchers relates to 'occupational relevance' of know-how. OP11, a part-time dental hygienist and lecturer in that occupational provision, used the term, "tailor to dental hygiene" to describe the need for the disciplinary knowledge to be modified for her occupational practices (both for teaching and work practices). OP21, working as a GP and teaching in medical education programmes, was more explicit in saying "disciplinary knowledge including basic science, biology and The National Institute for Health and Care Excellence (NICE) guidelines. Though these are the same subject matter, they are not in an application which requires recontextualizing distinct professional experiences to specific professional practice". The statement offers connections between 'occupational relevance' knowledge category with explicit (i.e., basic science and biology) and tacit (i.e., professional experiences and practices) types. The fluidity between the three knowledge types is not to be dismissed, and these connections illustrate the real-life nature of these knowledge types. The typology as described is illustrated in Figure 1.

Turning to the pedagogic recontextualization, literature reviews of teaching knowledge offer a structure of these practices. Shulman (1987) elucidated his seven explicit teaching knowledge categories such as general pedagogical knowledge (consisting of strategies and principles of classroom organisation), pedagogical

content (which is a combination of content and pedagogic know-how) and knowledge of educational contexts such as team working, institutional values and related policies. Loughran et al. (2003) focus on the tacit aspects of teaching know-how while Verloop et al. (2001) view the explicit and tacit characteristics of teaching knowledge as a language of articulation which is shared collaboratively. They subscribed to some of Shulman's categories such as subject matter, knowledge of students and their learning. They also centre on tacit and intuitive aspects of teachers. Clandinin (1985) takes the tacit know-how further with her 'personal practical knowledge' that encompasses experiences of teachers. These experiences, in theory, can include past life and pedagogic experiences and practices. Loo (2012) explicitly includes teachers' occupational experiences and practices as part of the wide definition of teaching know-how. Banks et al.'s (1999) wide classification of teacher knowledge includes Shulman's typology of subject knowledge, school/teaching institution knowledge, and pedagogic knowledge. They also offer another category, 'personal subject construction' which provides scope to include tacit varieties such as a teacher's past experiences and views. These pedagogic recontextualization-related classifications, when further analysed and developed, are featured in Figure 1. The related examples follow next.

Knowledge of educational contexts is described by OP2 (a teacher of gas fitting) and OP5 (a teacher of equine studies). For OP2, "the college [FE] requires a whole year plan including individual sessions", for OP5, teachers "are encouraged to "experiment and the college's openness to experiment using analogies and software". These two narratives offer insights into the institutional values and approaches to teaching and learning as espoused by Shulman (1987). Examples of knowledge of learners and their learning include are offered by OP2, OP8 and OP18 and OP19. OP2 stated, "by the end of the first year of the Business and Technology Education Council (BTEC) course, learners developed synthesis, analytical and critical skills and discussion abilities". These are a specialist work-related qualification at the pre-university level in England. OP8 (a teacher of accountancy) viewed her students' learning as from a "learner centred teaching where there was a maximum of 10 minutes input, peer assessment and she used team building activities such as a visit to Brockland Farm" to learn about her learners and offer peer-to-peer interactions. OP8's approaches to knowing her learners also include incorporating her educational values and those of her teaching institution. She subscribes to tacit forms of collaborative teaching and learning as the various categories of teaching know-how are not mutually exclusive. These examples also show that far from being mutually exclusive, there are overlaps and connections in the types of teaching knowledge. The suggested typology merely offers a structure by which greater insights of teaching know-how are perceived and applied where relevant. OP18 (a teacher of Emergency Medicine) understands his learners in his use of the appropriate teaching strategies. For him, medical students and junior doctors are offered formal and informal assessment approaches in their theoretical inputs in his hospital. However, at the students' medical schools, the teaching was still didactic. However, with consultants, a more formal approach is used, perhaps acknowledging their learned peers' expertise and showing them a certain level of respect. OP19, a lecturer at a medical school, explains that learners of "years 1 and 2 are [likely] to be didactic in their learning and teaching and that in year 3, they find learning very difficult". The nature of this difficulty may be because they are placed in actual medical settings such as in an Accident and Emergency department where there are more opportunities for informal learning and teaching

compare to their medical school settings. These students may also have pre-conceived ideas of what learning and teaching entail. OP6, an airline studies deliverer, touches on curriculum and content knowledge where she “uses her industrial experiences and narratives as there are no textbooks.” The lack of explicit and codified occupational knowledge emphasises the greater reliance of her occupational practices and experiences (i.e., occupational knowledge). Finally, some tacit examples of teaching know-how include Clandinin’s personal practical knowledge, which relies on the teacher’s past pedagogic experiences, past life and occupational practices and experiences. OP5, a teacher of fashion and textiles, “uses her research knowledge via exhibitions, etc. and ex-students and from business contacts” to offer her learners a much broader industrial perspective. OP12, in his accounting sessions, “draws on individual experiences and students’ need to experiment...uses real-world scenarios from individual experiences, the links with local businesses.” Finally, OP20, a surgeon and teacher, was clear about his reliance on “tacit knowledge, e.g., learning from students, teaching that is based on evidence, team learning [with peers and learners] and the use of real-life patients feedback”.

The penultimate process – occupational recontextualization – refers to the activities that teachers as practitioners, e.g. clinicians in Emergency Medicine, perform in work settings other than teaching. The concepts by Clarke and Winch (2004), Eraut (2004), Hager (2004), Hodkinson et al. (2004), and Winch (2014) help to structure the typology (Figure 1). The examples are taken from the 21 participants (Table 1).

Clarke and Winch (2004) are advocates of the front-loaded approach to occupational learning which is the acquisition of theoretical know-how at a teaching institution before it can be used in work contexts. They view this know-how as ‘applicable theory and practice appropriately informed by theory’ (Clarke and Winch, 2004, p. 519). Eraut (2004) focuses on the work-related contexts of learning. He offers a classification of know-how of theoretical knowledge, methodological knowledge (relating to procedures), practical skills and techniques, generic skills (e.g., IT and interpersonal communication) and general knowledge (e.g., cultural values). His explicit knowledge is those of the disciplines and knowledge resources (like the Internet) and tacit ones such as understanding of contexts, stakeholders, decision-making, and judgement). Hager (2004) also subscribes to learning in work settings and goes further to argue that learning can occur purely in work environments alongside occupational practices. Hodkinson et al. (2004) develop a human dimension of workplace learning that includes workers’ prior knowledge, understanding and skills, their dispositions/abilities and their sense of belonging to the workplace. Winch (2014) takes Eraut’s typology and widens it in its inclusion of these knowledge types. They are systematic knowledge (i.e., a theory that is applied in work contexts), technique (as procedural), skill sets for specific occupational contexts. Others include transversal abilities (which includes planning), management abilities (such as patience) and occupational capacity (i.e., awareness of the impact of the occupational practices with the wider society). The typology framework does not privilege one approach (e.g. front-loaded) to another (e.g. learning at work). It merely uses the different classifications to offer a classification of know-how via the recontextualization processes. Drawing from these classifications where there are overlaps such as theoretical knowledge, techniques and skills, and abilities, a typology of occupational recontextualization know-how is created again using the two knowledge classifications of explicit and tacit forms (Figure 1).

Drawing from the empirical evidence, examples of OR are included below. Examples of theoretical knowledge include OP3's description of equine "knowledge of show jumping, dressage, a theory of horses getting into a box..", and OP18 is conscious of the need of "retention of [his] theoretical knowledge [of Emergency Medicine] for practice." Regarding systematic knowledge, OP19, who teaches on an undergraduate medical education programme, stresses the relevance to "move from disciplinary knowledge, e.g., anatomy which is purely theoretical to a more applied form, e.g., bones and feet using a spiral curriculum [in teaching]." Staying with emergency medicine, OP16 mentions the "use of pattern recognition and 'fast-slow thinking' in decision making in his professional practice. This illustrates the technique and methodological knowledge as well as systematic knowledge. In the knowledge of the workplace, OP8, a teacher of accounting, mentions "teachers need industrial experiences especially the Association of Accounting Technicians (AAT) students ask teachers for practical examples" and OP18 emphatically stresses that an "accident and emergency ward is different to other wards." AAT qualifications are offered at up to the first-degree level.

For the tacit varieties, knowledge of the occupation and its wider environment include remarks by OP1, a teacher of gas servicing, where "real life experiences, e.g., being called to a house the next street from mine" to inspect a gas leak where the house eventually blew up. OP3, in equine studies, indicated "occupational knowledge was practical knowledge in the old days with Harvey Smith's [famous and colourful equestrian rider] 'get on the horse and get on with it' no-nonsense approach". OP10, in dental hygiene, emphasised skills of "how to handle/manage an anxious child, adult with learning difficulties, strategies (drawing from behavioural science)...communication with children and the use of body language" in her dental clinic. Of prior/occupational knowledge, OP14, in dental hygiene, refers to the use of "life experiences to connect with patients and explain to them why you're doing something, e.g., tooth brushing." OP19, in medical education, mentions her unusual past life experiences with her professional practice and teaching "life journey from banking, directorships, and general practice in the National Health Service (NHS) before teaching years 1 and 2 undergraduate medical education in the community and first degree in physics and music". NHS is a publicly funded national healthcare system in England.

The final recontextualization process – integrated applied recontextualization – offers insights of the final pedagogic activity, i.e., teaching strategies/approaches. This section focuses on typologies of the related factors of teaching strategies and the much under-researched tensions surrounding continuous professional development (CPD) needs (Figure 1).

For factors relating to teaching strategies, IT support is referenced by OP1, in gas fitting, in his "use of software like SOCRATIVE of crossword games and questions. OP14, in dental hygiene, refers to the professional standards and research activities in facilitating her teaching. OP1 again uses "analogies of tractor and bicycle types" to illustrate the flow of gases in the working of a gas boiler as an example of the occupational relevance applying metaphors and analogies. OP5 and OP10 emphasise the dual professional dimensions of teaching and occupational practice. The tensions surrounding CPD include generic and specific (such as discipline-related) offers as

expounded by OP12 where he lamented his college offered too generic CPD courses and not specific to his subject of accounting. Other like OP21 in Emergency Medicine, indicated that there are both internal and external CPD opportunities in her institution. OP19 wanted CPD provisions around “leadership and management issues” though, for her, these were not necessarily similar roles. Finally, OP11, in dental hygiene, wanted a more macro approach to CPD to include inputs on “mental illness awareness and counselling for occupational colleagues.”

Conclusion

This chapter focused on the recontextualization processes of occupational deliverers across the three academic levels of TVET, first-degree and professional education offers. The chapter further developed the recontextualized activities of the teachers to create typologies of each of these activities relating to content, pedagogy, occupational and finally integrated applied pedagogy for use in teaching sessions. In doing so, the findings offer not just a theoretical framework of occupational teaching pedagogic processes, but it also contributes a classification of each of the four recontextualizing activities that may apply to other disciplines other than the ones featured here. As shown in the discussions, none of the four recontextualization processes is discrete but inter-connected such as the symbiotic relationships between teaching and occupational practices. The inter-connectedness may account for its complexity on the one hand and elusiveness on the other to researchers to date in arriving at a credible conceptual framework. As shown above, the pedagogic activities of these teachers of occupational programmes are very conflated to accord an easy understanding. The conceptual framework has four forms of recontextualization to offer deep pedagogic insights.

The typology may be applied across the three academic levels. It enables the users such as deliverers, teacher trainers, and other stakeholders greater clarity as to the types of know-how/capacities (i.e., knowledge, abilities, skill sets and understanding) that are codified or tacit. This comprehensive definition of teaching knowledge offers its users much wider scope to comprehending this complex activity.

The implications affect the stakeholders, managers and policymakers. For stakeholders such as teachers and teacher educators, the teachers’ pedagogic, occupational and life experiences and practices could be included and offered credible space for teaching. For teacher training, trainees could be given opportunities to reflect on their teaching practices along with peers to use the typology. This approach would facilitate the trainees’ education of integrating the different forms of know-how such as disciplinary and pedagogic knowledge, occupational and real-life experiences, and abilities and skill sets. Managers can use the typology in the planning of CPD in both teaching and work organisations so that these professionals are continually updated in their teaching and work practices. Policymakers can offer supportive structures including funding to facilitate the professionalisation of these occupational deliverers.

References

Banks, F., Leach, J. and Moon, B. (1999). New Understandings of Teachers’ Pedagogic Knowledge. In J. Leach and B. Moon (Eds.) *Learners and Pedagogy* (pp. 89-110). London: Paul Chapman Publishing.

- Barnett, M. (2006). Vocational knowledge and vocational pedagogy. In M. Young and J. Gamble (Eds.) *Knowledge, Curriculum and Qualifications for South African Further Education* (pp. 143-158). Cape Town: Human Sciences Research Council Press.
- Becher T. (1994). The Significance of Disciplinary Differences. *Studies in Higher Education*, 19, 151-161.
- Bernstein, B. (1996). *Pedagogy, Symbolic Control and Identity: Theory, Research, Critique*. London: Taylor and Francis Limited.
- Bullough, Jr. R. V., and Stokes, D. K. (1994). Analyzing Personal Teaching Metaphors in Preservice Teacher Education as a Means for Encouraging Professional Development. *American Educational Research Journal*, 31(1), 197-234.
- Cameron, L. (2008). Metaphor in the construction of a learning environment. In E. A. Berendt (Ed.), *Metaphors for Learning: Cross-cultural Perspectives*, (pp. 159-176). Amsterdam: John Benjamins Publishing Company.
- Clandinin, J. (1985). Personal Practical Knowledge: A Study of Teachers' Classroom Images. *Curriculum Inquiry*, 15(4), 361-385.
- Clarke, L. and Winch, C. (2004). Apprenticeship and Applied Theoretical Knowledge. *Educational Philosophy and Theory: Incorporating ACCESS*, 36(5), 509-521.
- Collins, H. (2010). *Tacit and Explicit Knowledge*. Chicago: University of Chicago Press.
- Eraut, M. (2004). Transfer of knowledge between education and workplace settings. In H. Rainbird, A. Fuller and A. Munro (Eds.) *Workplace Learning in Context*, (pp. 201-221). London: Routledge.
- Evans, K., Guile, D., Harris, J. and Allan, H. (2010). Putting knowledge to work: A new approach. *Nurse Education Today*, 30(3), 245–251.
- Fry, H., Ketteridge, S. and Marshall, S. (2014). *A Handbook for Teaching and Learning in Higher Education: Enhancing academic practice*. Abingdon: Routledge.
- Hager, P. (2004). Front-loading, Workplace Learning and Skill Development. *Educational Philosophy and Theory: Incorporating ACCESS*, 36(5), 523-534.
- Handal, G. (1999). Consultation Using Critical Friends. *New Directions for Teaching and Learning*, 79, 59-70.
- Hodkinson, P., Hodkinson, H., Evans, K., Kersh, N., Fuller, A., Unwin, L., and Senker, P. (2004). The significance of individual biography in workplace learning. *Studies in the Education of Adults*, 36(1), 6-24.

- Huddleston, P. and Unwin, L. (2013). *Teaching and Learning in Further Education: Diversity and change*. Abingdon: Routledge.
- Lakoff, G., and Johnson, M. (1980). *Metaphors We Live By*. Chicago: The University of Chicago Press.
- Loo, S. (2012). The application of pedagogic knowledge to teaching: A conceptual framework. *International Journal of Lifelong Education*, 31(6), 705-723.
- Loo, S. (2014). Placing 'knowledge' in teacher education in the English Further Education teaching sector: an alternative approach based on collaboration and evidence based research. *British Journal of Educational Studies*, 62(3), 337-354.
- Loo, S. (2018). *Teachers and Teaching in Vocational and Professional Education*. Abingdon: Routledge.
- Loo, S. and Jameson, J. (2017). Introduction: vocationalism in the English context. In S. Loo and J. Jameson (Eds.) *Vocationalism in Further and Higher Education: Policy, Programmes and Pedagogy* (pp. 1-6). Abingdon: Routledge.
- Loughran, J., Mitchell, I. and Mitchell, J. (2003). Attempting to document teachers' professional knowledge. *Qualitative Studies in Education*, 16(6), 853-873.
- Lucas, B., Spencer, E. and Claxton, G. (2012). *How to teach vocational education: A theory of vocational pedagogy*. London: City and Guilds Centre for Skills Development.
- Nonaka, I. and Takeuchi, H. (1995). *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York: Oxford University Press.
- Peel, D. (2005). Dual professionalism: facing the challenges of continuing professional development in the workplace? *Reflective Practice: International and Multidisciplinary Perspectives*, 6(1), 123-149.
- Polanyi, M. (1966). *The Tacit Dimension*. London: Routledge and Kegan Paul.
- Robson, C. (2002). *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*. Oxford: Blackwell Publishing.
- Shulman, L. S. (1987). Knowledge and Teaching: Foundations of the New Reform. *Harvard Educational Review*, 57(1), 1-22.
- Smeby J-C. (1996). Disciplinary Differences in University Teaching. *Studies in Higher Education*, 21, 69-79.
- United Nations Educational, Scientific and Culture Organisation (UNESCO). (2012). *Building Skills for Work and Life*. 3rd UNESCO TVET Congress, Shanghai, 16 May.

Verloop, N., Van Driel, J. and Meijer, P. (2001). Teacher knowledge and the knowledge base of teaching. *International Journal of Educational Research*, 35(5), 441-461.

Volkman, M. J., and Anderson, M. A. (1998). Creating professional identity: Dilemmas and metaphors of a first-year chemistry teacher. *Science Education*, 82(3), 293-310.

Winch, C. (2014). Know-how and knowledge in the professional curriculum, In M. Young and J. Muller (Eds.) *Knowledge, Expertise and the Professions* (pp. 47-60). London: Routledge.

Appendices

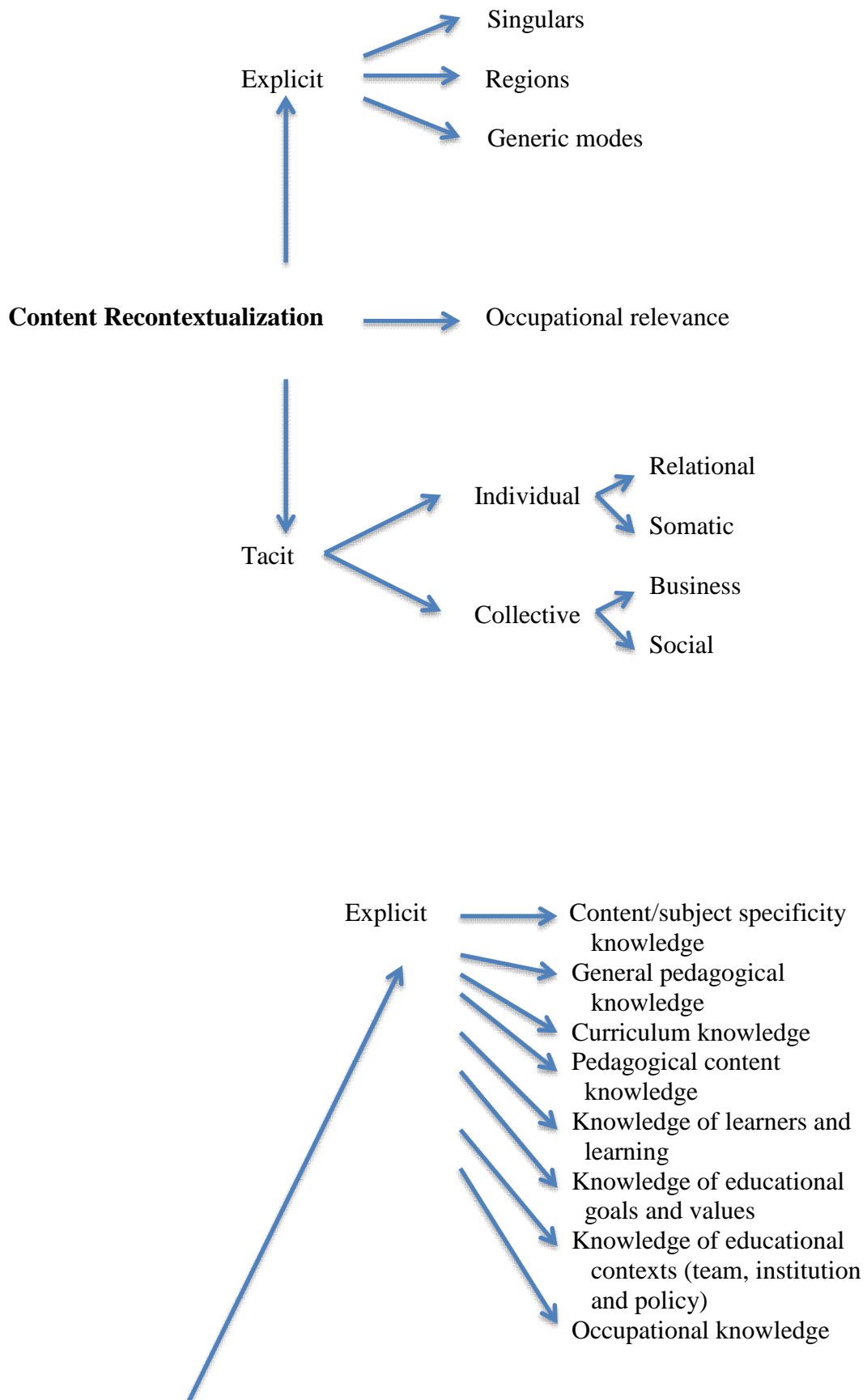
Table 1. Details of participants

Participant Gender Age	Teaching institutions Level of academic qualifications	Full-time/Part-time Years of teaching experience	Disciplinary areas	Occupational/ life experiences
OP1 Male 50s	FE college Level 4	Full-time 15 years	Gas services	Worked in the gas service industry as an engineer and as trainer and assessor
OP2 Female 50s	FE college Level 5	Full-time 8 years	Health and social care	Worked as health and social care worker and nursery nurse in the early years and childcare areas
OP3 Male 40s	FE college Level 4	Full-time 3.5 years (4 years p-t)	Equine studies	Worked and performed in the equine industry and related governing bodies
OP4 Female 40s	FE college Level	Full-time 5 years	Equine studies	Worked in the equine industry
OP5 Female 50s	FE college Level 5	Full-time 13 years (6 years in HEIs) Currently 0.6	Art and design Fashion and textiles	Worked in banking and retail (craft and museums) Currently working as a fashion designer
OP6 Female 40s	FE college Level 4	Full-time 7 years	Travel and tourism	Worked in the airline industry as part of a cabin crew for 8 years
OP7 Male 40s	Adult and community Level 5	Part-time	Art – painting and printmaking	Working as a printmaker and architect
OP8 Female 40s	FE college Level 5	Full-time 15 years	Business and Accountancy	Lived and worked abroad as a Chartered Accountant and with the British Army

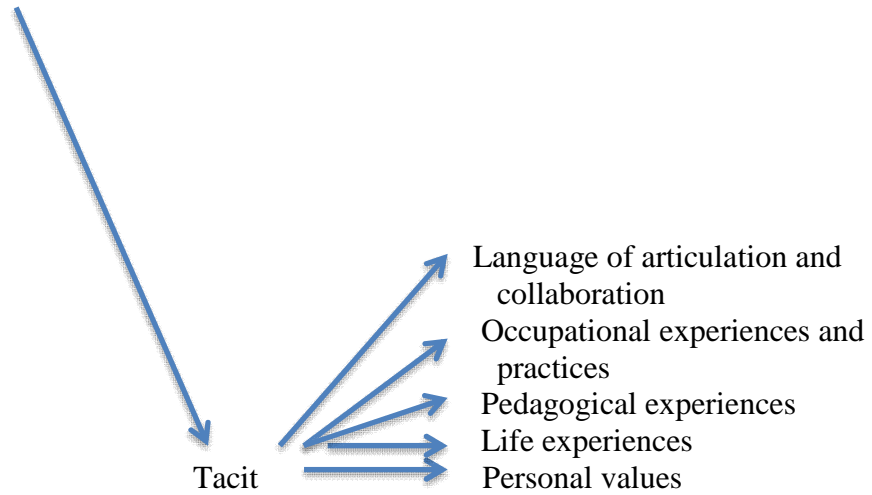
OP9 Female 50s	HEI Level 4	Part-time 14 years	Dental hygiene and psychology	Lived abroad and working as a dental hygienist for 31 years and was the British Navy
OP10 Female 50s	HEI Level 5	Part-time 15 years	Dentistry	Working as a community dental officer for 32 years
OP11 Female 50s	HEI Level 4	Part-time 20 years	Dental hygiene	Working as a dental hygienist for 25 years
OP12 Male 50s	FE college Level 4	Full-time 4 years	Accountancy	Worked in industry as an accountant and finance director for 4 years
OP13 Female 60s	FE college Level 4	Full-time 11 years	Accountancy	Worked in industry as an accountant for 18 years
OP14 Female 30s	HEI Level 4	Part-time (2 days/wk)	Dental therapist	Working as a dental therapist for 8 years
OP15 Female 30s	HEI Level 5	Full-time 8 years	Clinician (on the undergraduate medical education)	Worked as a general practitioner
OP16 Male 40s	HEI Level 5	Full-time 10 years	Emergency medicine	Working as a consultant in the Accident and Emergency
OP17 Male 40s	HEI Level 5	Part-time	Emergency medicine	Working as a locum in the Accident and Emergency
OP18 Male 30s	HEI Level 5	Full-time 1 year	Emergency medicine	Working as a trainee in the Accident and Emergency
OP19 Female 40s	HEI Level 5	Full-time 2 years	Clinician (on the undergraduate medical education)	Worked as a strategic business analyst in the banking sector, a director in a mobile communications company and as a general practitioner
OP20 Male 40s	HEI Level 5	Part-time 7 years	Vascular surgery	Working as a surgeon in several hospitals including in Accident and Emergency

OP21 Female 30s	HEI Level 5	Part-time 8 years	General practice	Working as a general practitioner partner in a medical centre and worked in Accident and Emergency
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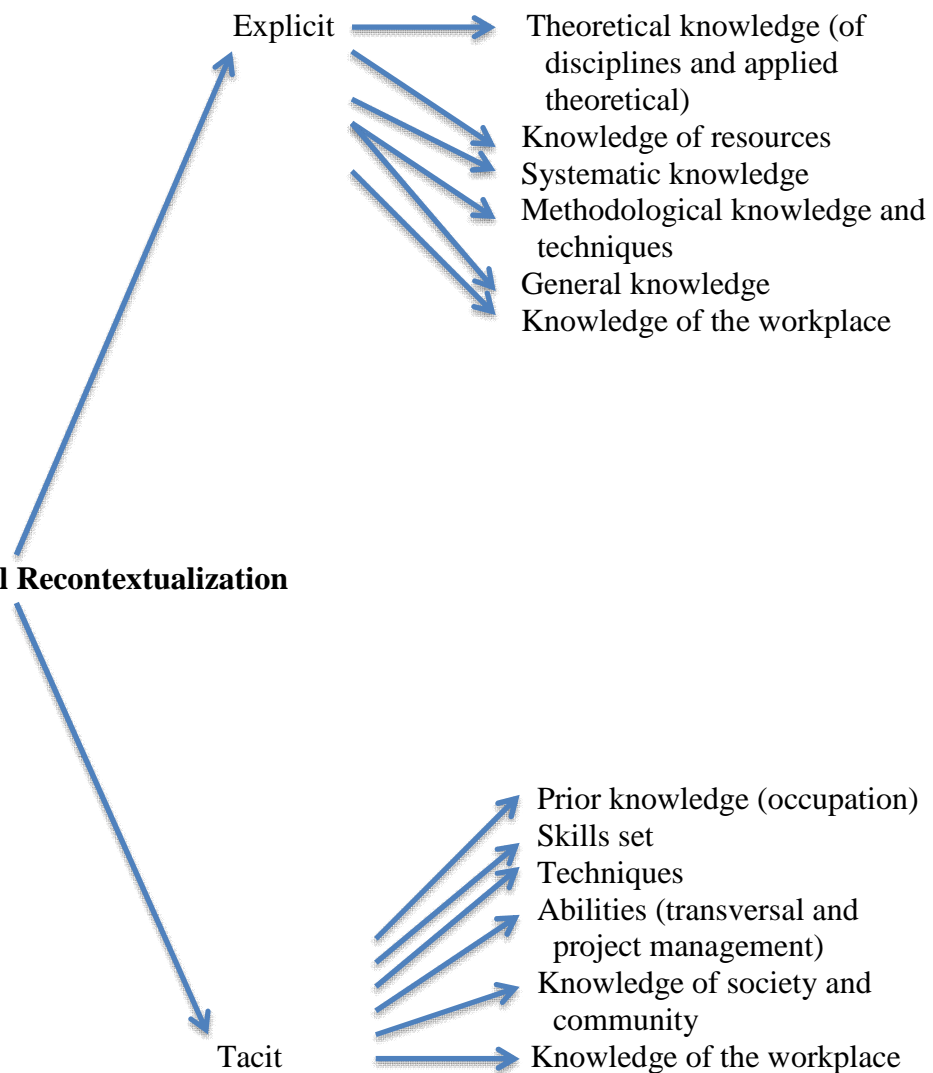
Figure 1. Typology of Recontextualization Processes

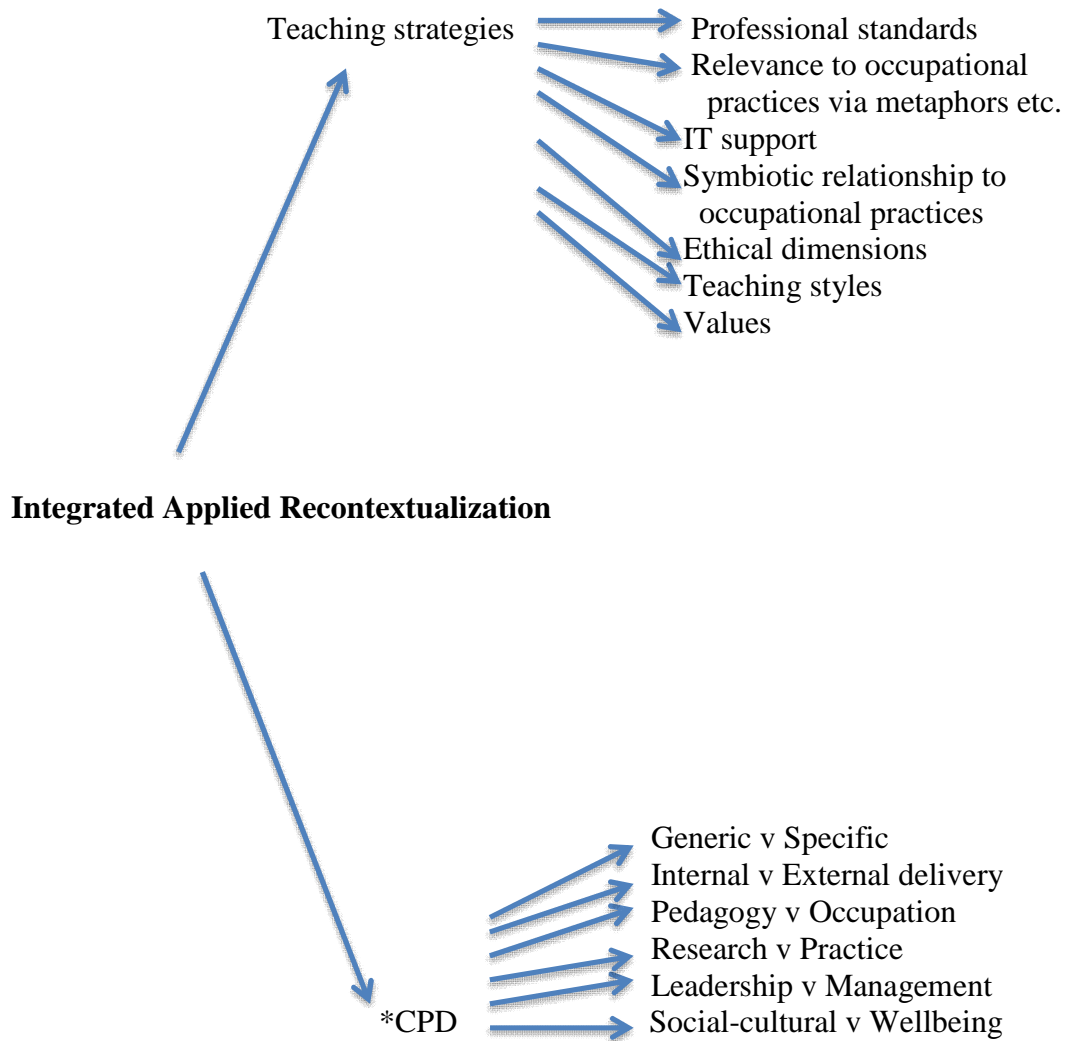


Pedagogic Recontextualization



Occupational Recontextualization





*CPD – continuous professional development