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Vocational Teachers' Knowledge, Experiences and Pedagogy

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Abstract (6457 words in total incl. Fig. 1)
This chapter aims to address the two issues of teacher knowledge and pedagogy of VET in the English FE sector. Drawing from a larger research project, it uses the empirical findings from the questionnaire survey and semi-structured interviews of seven FE participants, who teach on VET provisions.

In addressing the issue of teacher knowledge, a delineation of teaching knowledge, relevant disciplinary knowledge (Becher, 1994) and theories of learning (Bernstein, 1996) are included. Typologies of teacher knowledge (e.g. Clandinin, 1985; Shulman, 1987; Loo, 2012) are employed to offer a wider perspective of teacher knowledge. From an occupational perspective, conceptions of theoretical knowledge, knowledge of procedures, skill sets, dispositions and past work know-how are drawn from researchers such as Bernstein (1996), Eraut (2004) and Winch (2014). The teacher know-how is used to conceptualise a VET pedagogy framework. Using a Bernsteinian conceptualisation of knowledge types, the processes of recontextualization are used. These processes offer insights into how teacher knowledge may be modified through selection, relocation and refocus for application in a VET pedagogic setting.

Using examples of the empirical data, the types, sources and application of VET teachers' know-how are delineated. In this delineation, the theoretical framework draws on concepts such as knowledgeable practice (Evans, 2016), practice architectures (Kemmis and Green, 2013) and Systems 1 and 2 (Kahneman, 2012). The concepts offer additional insights into how VET deliverers use their know-how towards the final choice of the relevant teaching strategies in their specific pedagogic settings. This chapter finally offers contributions and implications resulting from this study.

Keywords
Experiences; Knowledge; Occupational; Pedagogy; Teachers; Technical and vocational education and training

Introduction

This chapter contributes to the 'VET Teacher/Trainer Education' section and on the two themes of teacher knowledge and experiences, and vocational pedagogy. This chapter starts with Brian Simon's premise that there has been a lack of a rigorous pedagogical approach in England. He suggested that this was due to the views of a then homogeneous socio-cultural elite such as the independent fee-paying schools ('public schools') and the well-established higher education institutions of Oxford and Cambridge. They viewed the character development of males as more important than a professional approach to teaching and learning (Simon, 1981). This amateurish and pragmatic approach continued in the further education or post-compulsory education sector in England. Coffield (1998) critiqued the amateurish manner concerning the lack of conceptual definitions such as pedagogy and vocational education and training. The unprofessional approach coupled with undefined concepts remained in spite of the

continual emphasis on the importance of teaching and learning in the UK (e.g. Department for Education (DfE), 2010: DfE, 2016) and internationally (Tatto, 2013).

Against the above backdrops, this chapter aims to address the issues of teachers' knowledge and their experiences, and the pedagogy of vocational education and training or technical vocational education and training (TVET). TVET is an internationally recognised term to denote work-related provisions (United Nations Educational, Scientific and Cultural Organization, 2012). This term is preferable as it dissociates the English context of work-related studies where issues of the academic-vocational divide and socio-cultural aspects have impeded robust research in the sector (Loo, 2018). The post-compulsory sector in England offers a wide range of teaching settings. It includes FE colleges, adult and community learning providers, armed and uniformed services, commercial organisations and independent training providers, industry, specialist colleges, prisons and offender learning institutions, public-sector organisations, and voluntary and community sector organisations (Education and Training Foundation, 2014). The students include 16 plus, adult and lifelong learners who may have varied learning abilities. This sector is known for offering additional learning opportunities for those leaving compulsory education. The provisions are diverse with over three-quarters of the provisions in work-related areas. The popular programmes (regarding the estimated number of teachers) are in the Visual and Performing Arts and Media, Health, Social Care and Public Services, Foundation Programmes, Business Administration, Management and Professional, and Hospitality, Sports, Leisure and Travel (Frontier Economics Limited, 2014, Table 15). By implication, these lecturers of vocational-related courses will have the requisite TVET or occupational experiences in addition to their pedagogic experiences. The access to occupational programmes and additional learning opportunities are some of the characteristics of the FE sector in England.

This chapter examines the TVET teachers' knowledge (including their occupational experiences) and its relevance on the pedagogy concerning teaching strategies. Even though the focus is on TVET delivery in England, the findings may have implications for the equivalent work-related programmes in other countries. In elucidating this focus, the chapter has five sections following this introduction. The second section investigates the conceptual framework of TVET teachers' knowledge and pedagogic activities and the following section on details of the supporting research project. The fourth section delineates the findings and discussion using empirical data. The final section ends with contributions and implications resulting from this investigation.

Conceptual framework of vocational teachers' pedagogy

This chapter begins with a dual professional approach (Handal, 1999; Robson et al., 2004; Peel, 2005) to understanding teachers' pedagogic activities where they refer to their teaching and professional/vocational know-how including knowledge and experiences. These two practices – teaching and vocational - offer a starting basis to theorising a framework. This ontological approach of starting from knowledge acquisition and application is derived from researchers such as Bernstein (1996), Eraut (2004) and Winch (2014). For this chapter, knowledge is defined eclectically to capture the varied forms of know-how in delineating a vocational teacher's pedagogic knowledge. The delineation of the acquisition and application of know-how also offers the theorization of a conceptual framework, and this separation of knowledge, for this chapter, merely offers a logical discussion structure. In reality, the separation of the two

aspects of knowledge may not be simple and often complex. In arriving at a conceptual framework, only the circumscribed accounts of the relevant theories are employed and not exhaustive accounts to satisfy the aims of the chapter.

From the teaching practice dimension, Becher (1994), Bernstein (1996) and Smeby (1996) suggested that knowledge of the relevant disciplines, such as psychology and sociology for the education field, is required as a starting basis. Included in the relevant disciplines may be theories of learning where teachers are needed to acquire and understand how learning may occur and that the eventual pedagogic strategies/approaches may result (Becher, 1994; Bernstein, 1996; Smeby, 1996). Bernstein classifies knowledge into two forms: vertical and horizontal discourses. The former type represents theoretical knowledge that is "explicit, coherent, systematically principled and hierarchical organization of knowledge" and "a series of specialized languages, each with its own specialized modes of interrogation and specialized criteria as in the humanities and social sciences" (Bernstein, 1996, p. 172). These two vertical knowledge structures – hierarchical and horizontal - offer ways of classifying subject areas where hierarchical knowledge may include areas such as biology, chemistry and physics. These areas are similar to Becher's (1994) classification of hard-pure disciplines. These areas have significance in vocational learning such as equine studies (biology) and gas fitting (chemistry and physics). From the 'horizontal knowledge structure' variety of vertical knowledge, social sciences areas such as sociology (e.g. learning theories) may be used in education. Bernstein offers a link between vocational training and compulsory education where he viewed horizontal knowledge structures as strong and weak grammars. His link with vocational learning such as in the area of crafts (especially pottery) is indicated below:

> 'Crafts' are often acquired through apprenticeships where mastery is more a tacit achievement than a consequence of an explicit pedagogy. This suggests from the point of view of this paper that 'crafts' could be regarded as *tacit* [Bernstein's use of italics] horizontal knowledge structures.
>
> (Bernstein, 1996, p. 181)

This passage is relevant to this investigation as Bernstein acknowledges the learning of crafts can be a form of vertical discourse despite the fact that his primary concern is in compulsory education. This link with vocational learning offers conceptual space to explore theoretical knowledge and pedagogy.

Turning to teaching knowledge, Shulman (1987) offered a typology. It consists of general pedagogical knowledge (compromising of principles and teaching strategies for classroom management and organisation), pedagogical content knowledge (which is a combination of content and pedagogy), knowledge of learners, knowledge of the educational contexts (such as team members and teaching institutions) and knowledge of educational values. Other researchers have developed from this typology by focusing on the tacit aspects as opposed to Shulman's more explicit nature of teaching knowledge. Loughran, Mitchell and Mitchell's (2003, p. 870) tacit investigation was a listing of the "rich array of information, ideas and understandings that inform teachers' practice". Verloop, Van Driel and Meijer (2001) used the above two studies to focus on teachers' practical knowledge and beliefs, and they offered six categories related to subject matter, students, learning, and intuitive aspects of teacher know-how, subject specificity and teachers' know-how. Verloop et al.'s cognitive foci provide another perspective to Shulman's explicit teaching know-how and Verloop et al.'s tacit

approach Clandinin (1985) uses the concept of 'personal practical knowledge' to denote a teacher's experiential history, both professional and personal. This form of know-how is further developed by Loo (2012) where teachers' occupational practices are explicitly included in teaching know-how. Finally, Banks, Leach and Moon's (1999, p. 95) teachers' professional knowledge model incorporates the "complex amalgam of past knowledge, experiences of learning, a personal view of what constitutes 'good' teaching and belief" that draws on the earlier literature sources. In short, teaching know-how may have the following characteristics: explicit, tacit, cognitive, practical, pedagogy-occupation-life-related experiences that are relevant to teachers.

Similarly, knowledge concerning occupational practices requires a base of disciplinary or theoretical know-how that may be explicit. The base may include knowledge of procedures, skills (e.g. interpersonal and intrapersonal ones which are tacit), techniques, transversal abilities, project management abilities, personal capabilities and occupational awareness (Eraut, 2004; Winch, 2014). This occupational knowledge base constitutes a wide spectrum than a pedagogical one. It includes a worker's past know-how (including theoretical and procedural knowledge and experiences), understanding of work and specific job contexts, skills (such as technical and non-technical ones), workers' dispositions and perceptions of the work environment, which they operate.

The occupational know-how has elements of explicit and tacit forms. The individual aspect of tacit know-how may be scientific (as suggested by Polanyi [1966]). Collins (2010) offers three types of tacit know-how. They are relational tacit knowledge where individuals view it as either secrets or that it is not known to others; somatic tacit knowledge which people can perform such as riding a bicycle; and collective tacit knowledge where people use knowledge (e.g. linguistic rules) as part of society. Nonaka and Takeuchi (1995) offer the final variation of tacit knowledge. It is tacit knowledge, which resides in people and is used in commercial activities. Collins' collective tacit knowledge is posited in the Western tradition and Nonaka and Takeuchi's in the Japanese one. Also, Collins' CTK resides in society whereas Nonaka and Takeuchi's in business organisations (Loo, 2017). These tacit knowledge types offer useful insights into understanding the tacit aspects of teachers' know-how and how they may be applied.

The applications of teaching and vocational/ occupational knowledge may be understood through the processes of recontextualization (Bernstein, 1996; van Oers, 1998; Barnett, 2006; Evans, Guile, Harris and Allan, 2010; Loo, 2012, 2014a). Knowledge may be modified through selection, relocation and refocus in another setting (Bernstein, 1996). From a teaching perspective, a learning theory such as cognitive constructivism (from psychology discipline) as advocated by Bruner (1996) is used in an educational setting. This setting includes contexts that relate to the academic level of the programme (e.g. in health and social care), the types of learners and the specific aspect of the curriculum in which this know-how is applied. From an occupational/vocational angle, physics as a discipline may be used in the area of gas fitting. From a recontextualization process, the nature of the disciplinary knowledge is changed and similarly from the users such as teachers and learners concerning the specific vocational area (Loo, 2012; 2014a). This modification of knowledge and users' perspectives is contrary to Bernstein where even after recontextualization, the vertical knowledge remains the same.

The recontextualization process is situated in dynamic environments, and it involves people in socio-cultural dimensions. The process is also context related and can be innovative (van Oers, 1998). It occurs in teaching and work-related activities at the TVET academic level (Loo, 2016). There are different types of this process. Barnett (2006) suggest two types: reclassificatory recontextualization which is viewed as a toolbox of applicable knowledge and pedagogic recontextualization for teaching. These identifications of recontextualization processes offer insights into how theoretical or disciplinary knowledge may be used for teaching vocational programmes where disciplinary knowledge is made relevant to the specific vocational area. Evans et al. (2010) use four types of recontextualization to provide a greater understanding of teaching and learning. They are content recontextualization (relating to the specifications of a programme), pedagogic recontextualization (relating to teaching), learner recontextualization (relating to the strategies that a learner employs to acquire and understand the relevant know-how), and workplace recontextualization (relating to the procedures and protocols of the workplace). Loo (2012, 2014a) provides explicit insights into how the recontextualization processes may be used in vocational teaching from the teachers' perspectives.

In addition to the possible types of recontextualization processes, there are relevant concepts that add to the understanding of practitioners in vocational work settings carry out their roles. The next three frameworks foci on learners and they acknowledge a socio-cultural dimension. Kemmis and Green (2013) use 'practice architecture' to indicate the sayings, doings and relatings of these users in the respective work organisations. Evans (2016) identifies 'knowledgeable practice' as a means to understanding how formal and informal learning can occur in workplace settings and beyond. Learning occurs when mentoring, coaching and peer learning happen where these activities impact both learners/workers, either individually or collaboratively, and the specific work institutions. Kahneman (2012) uses his Systems 1 and 2 to explain how decisions are made in areas of work. System 1 is reliant on a worker's intuition that is based on experience and is irrational. It offers a quick decision. System 2 relies on rational and cognitive interactions, which is a slower form of decision-making process.

From the above eclectic and relational approach of defining teaching and occupational knowledge, it offers insights into the types and sources of know-how that are needed for teaching and vocational working. These forms of know-how are applied in pedagogic and work settings through the various recontextualization processes and three identified practices. The next part maps out a conceptual framework to illustrate how these types of know-how may be used in facilitating a teacher with vocational experience to carry out the pedagogic activities on a TVET programme.

The theoretical framework (Figure 1) draws from the above literature reviews and is structured initially with the dual professionalism dimensions of teaching and TVET / occupational practices (starting from the left-hand side). Starting with the teaching practice, disciplinary knowledge is referred to for teaching purposes. Examples of learning theories such as behaviourism and social constructivism are derived from the subjects such as psychology, sociology and business management (Loo, 2014b). This knowledge needs to be applied to the content or specifications of the specific TVET programme to ascertain how this can be made relevant to use for teaching. The process of relocating and refocusing of knowledge is termed content recontextualization. The

modified type of know-how is known as pedagogic knowledge, which can be used for teaching. This stage also includes another aspect of curriculum development where the other type of disciplinary knowledge such as from the subjects of physics and biology may also be made relevant to the specific TVET area. An example of gas flow theory in physics will be required for learning and teaching in the gas fitting specifications. How this is made relevant to the learners will be the task of the curriculum developers and deliverers via content recontexualization.

The pedagogic knowledge is then applied for teaching purposes, and the process related to this is pedagogic recontextualization. This is where the pedagogic knowledge is selected and refocused for teaching. Examples include a series of lessons or a one-day long session, depending on the structure of the provision, and the identification of the specific aspects of the specifications that need to be delivered at the appropriate academic level. The typologies of teaching knowledge mentioned earlier would be relevant to this process. Also related to this recontextualization process is the 'work knowledge'. This know-how refers to the nature of the teaching institutions that the teacher works in and knowledge of its aims (e.g. visions of the institution), systems (e.g. IT and mentoring) and protocols (e.g. regulations governing extra curricular activities). It can have both individual and collective dimensions. The know-how may be tacit or explicit, and it can consist of skill sets (e.g. interpersonal), knowledge resources (from colleagues and the Internet), understanding (of situations, contexts and stakeholders), and involves decision-making and professional judgement. Notions of 'knowledgeable practice' and 'practice architectures' regarding the organisation's practices such as the mentoring system and the articulations with peer teachers and stakeholders are useful in understanding this complex activity.

Both types of work and pedagogic know-how are included in this complex application in the teaching process and are called pedagogic recontextualization. The modified form of know-how is applied pedagogic knowledge. Included in this complex amalgam of know-how is the teacher's belief or vision along with other pedagogic dimensions such as subject area, learner types, academic level etc. to influence the eventual choice of an appropriate teaching strategy in a specific teaching session in the final recontextualization process – integrated applied recontextualization (IAR). Before this process is discussed, we now turn to the other dimension: TVET/occupational practice.

This dimension refers to the working and learning processes of a TVET worker. It is relevant for those teaching in the work-related provisions as they need to rely on their occupational know-how to inform their learners. It adheres to a similar structure as in the teaching dimension. Through the content recontextualization process, the disciplinary knowledge such as physics can be relocated and refocused to suit the needs of the specific TVET area such as gas fitting. Aspects of this occupational knowledge such as gas flow knowledge can be used by the learners/workers for gas fitting. This know-how is changed from its initial disciplinary/theoretical know-how since it is contextualised to the specific TVET area requirements. This occupational knowledge is then used to frame a curriculum as part of the acquisition phase. Aspects of the curriculum are then selected, relocated and refocused for work purposes through a process of occupational recontextualization. This process involves another type of knowledge source – work knowledge. This work knowledge relates to the work institution such as its systems, protocols and other aspects relating to the work settings. Work knowledge, like in the other dimension, offers individual and collective forms

and can be tacit or explicit, includes skills (e.g. interpersonal), knowledge resources (e.g. colleagues), understanding (of contexts and stakeholders), and involves decision-making and judgement.

One may argue that the occupational and work know-how may be specific to the user or worker, as a teacher, as each has specific practices and experiences even though the training may be similar. Concepts such as 'knowledgeable practice', 'practice architectures' and systems 1 and 2' provide rich understandings of this complex work activity. This activity, together with the pedagogic activity after the pedagogic recontextualiztion process, offer insight into the final process: IAR. Thus IAR is a result of two knowledge types – applied pedagogic knowledge and applied occupational knowledge – to produce Occupational Pedagogic Knowledge (OPK) or Occupational Teachers' Capacities (OTC). From this final know-how, a teacher may ascertain the relevant teaching strategies/approaches. These approaches are dependent on contextual factors such as the TVET area, academic level of the provision, learners, accreditation of professional bodies, types of TVET artefacts and teachers' beliefs (to name a few). Some of these teaching strategies include demonstration, simulated environments, field trips and problem-based scenarios. Publications by Huddleston and Unwin (2013) and Lucas, Spencer and Claxton (2012) offer a wide selection of these pedagogic approaches. Lucas et al.'s report (2012, p. 115) acknowledges that "vocational pedagogy and practical knowledge is an under-theorized area of education" and that the report offers a "proof of concept" and not a comprehensive theory of vocational pedagogy. It appears that the report focuses on teachers and learners and that the role of knowledge (section 8.2.1) merely plays a part without a comprehensive discussion or a conceptual framework of vocational pedagogy. It, however, offers a broad survey of the teaching strategies in the FE sector rather than specifically of vocational education.

This framework (Figure 1) exhibits dynamism and fluidity in differing directions along its structure. A teacher may re-visit any of the stages of the framework (and not necessarily at the start of the two practice dimensions) resulting from either teaching or occupational triggers/incidents. This ongoing reflective process offers different perspectives, which the deliverer can utilise in future teaching activities such as a different choice of teaching strategy or a different ordering of teaching sequence from a specific part of a curriculum specification over a period.

Project details

The findings of the chapter are based on a larger project (Loo, 2018). The main research questions include, what is occupational pedagogy? and how is its related knowledge acquired and applied by those teaching on the programmes? 'Occupational pedagogy' refers to the type of teaching and learning across the academic levels of vocational/TVET, higher vocational/first-degree and professional education. Occupational pedagogy is used to denote work-related teaching and learning activities across the academic levels as well as varied occupational/professional disciplines. For this chapter, the focus is on the TVET provisions, and the disciplines that are featured in the project are airline studies, art (painting and printmaking), equine studies, fashion and textiles, gas services, and health and social care. A purposive sample of seven teachers (P1-7) in the TVET level is included from a total of 21 participants from the larger project. The research methods employed included a questionnaire survey and semi-structured one-to-one interviews. Salient details such as gender, age, pedagogic,

occupational and relevant life experiences and academic and professional qualifications were captured from the quantitative survey, following a pilot study in which the survey questions were fine-tuned. This process was carried out on the topic questions for the interviews. The interviews captured data related to the participants' perspectives of the types and sources of know-how that were applied in their teaching of work-related programmes. Documentary evidence such as programme specifications was also gathered to triangulate data from the other two research sources. The types of data were analysed using generated codes, identified phrases, patterns, themes and further triangulated the identified scenarios to form a typology. This typology was then linked to the theoretical frameworks (Robson, 2002). The analysed empirical data from the project was then used in the next section to discuss the types, sources and applications of the teachers' know-how.

Discussion

This section has two parts consisting of the acquisition and application of knowledge for vocational teaching and learning. This structure is used to parallel the conceptual framework (Figure 1), which has been derived from the relevant literature reviews.

From the perspectives of the acquisition of teaching knowledge, P1 is a full-time FE college lecturer of travel and tourism with seven years teaching experience and has worked in the airline industry as part of a cabin crew for eight years. She uses her disciplinary knowledge (Becher, 1994; Bernstein, 1996; Smeby, 1996) from her first-degree in Geography, teacher training qualification (PGCE) and occupational experiences in the airline industry to teach on the Edexcel BTEC Level 3 Certificate in Aviation Operations (NO25388-L3-AOps (page 1of 66). This provision consists of mandatory and optional units, and they include The UK Aviation Industry, Health and Safety in the Aviation Industry, Aviation Geography and Terminology, Customer Service in the Aviation Industry, Human Resources in the Aviation Industry, Handling Air Passengers and Onboard Passenger Operations. She relied on her first-degree theoretical knowledge to assist her in teaching the BTEC units such as Aviation Geography and Terminology (Unit code: T/504/2281). The aims of this unit include developing "knowledge of the location of major destinations and airports of the world". The unit also enables "learners to expand their knowledge in relation to countries, capitals, hubs, gateways and air travel destinations and to recognise air travel routes through different hemispheres, International Air Transport Association (IATA) areas and sub-areas via different global indicators" (p. 1). The theoretical/disciplinary knowledge from P1's first-degree is used to make it relevant to the aviation industry provision via the content recontextualization process.

Similarly, P2, who teaches gas servicing at an FE college with 15 years teaching experiences, has worked in the gas services industry as an engineer (6 years experience) and as a trainer and assessor (13 years). He uses his occupational know-how (knowledge and vocational experiences) (Clandinin, 1985; Banks et al., 1999; Loo, 2012, 2014a) as he has "the relevant theoretical and practical skills to pass onto our students. I can also use anecdotes to put into context the theory". He views his sources of knowledge from NICEIC textbooks, industry update bulletins, and trade magazines in addition to his initial acquisition of industry-related knowledge.

For P1 and P2, from a curriculum development perspective, the disciplinary knowledge of aviation and gas services sectors respectively needs to be selected and refocused in

appropriate bit size for each lesson. Lesson planning over the duration of the one-year programme is required. Also required is the establishment of the appropriate academic level for the learners (Shulman, 1987; Verloop et al., 2001; Loughran et al., 2003). Winch (2015) suggested an arbitrary rule of equivalences, which is a level below the 'academic equivalent' provision concerning the vocational one. P2 suggested the depth of knowledge that his students needed was not the same as the Advanced level equivalent (Level 3) in the related subjects but necessary for their occupational practices. The unspecified knowledge level places the onus on the deliverer to ascertain the appropriate academic level of disciplinary knowledge for the learners, the amount for a given lesson and ultimately, the teaching strategy to disseminate it (Bernstein, 1996).

Also, participants such as P2 espoused the related pedagogic theory for their subject area where he mentioned his chargers were more likely to be kinesthetic learners. He also indicated that he would use a social constructivist learning theory to engage with his learners to aim for "at the end of the first year of the BTEC programme, the learners would have developed synthesis, analytical and critical skills and discussion abilities". For P3, a health and social care lecturer at an FE college with eight years full-time teaching experience utilised behavioural management strategies, and P1 used Bloom's taxonomy (Anderson et al., 2001) to enhance her travel and tourism students' learning. These education theories may be drawn from disciplines of psychology, sociology and business management (Loo, 2014b). To date, knowledge from the disciplines such as geography (by P1), physics and chemistry (by P2) and psychology (P3) is used to engage with their learners in their respective vocational areas. Similarly, they drew from disciplines of psychology, sociology and business management to enable them to use their learning theories to make relevant their vocational areas via the content recontextualization process.

The next part of this discussion section focuses on the applications of know-how of these teachers. Having selected and refocused the related aspects of the disciplines, the teachers would then need to apply the know-how to their specific teaching contexts. Some of these contexts relate to the appropriate academic level (Level 3), and the manner in which the specifications are delivered (such as front loaded of theory before vocational practice as suggested by Clarke and Winch [2004] and learning while in work settings [Hager, 2004]). Also, the contexts include the pacing of the content over the duration of the programme (Bernstein, 1996), the specificities of the teaching institution (Shulman, 1987; Banks et al., 1999). Finally, contexts may refer to the types of learners and the individuals' and group's requirements (Shulman, 1987; Verloop et al., 2001). The relevant process – pedagogic recontextualization – utilises the previous recontextualized know-how of pedagogic knowledge (from teaching) to modify the specifications in readiness for teaching.

This revised knowledge is known as applied pedagogic knowledge. Equivalent to this teaching dimension is the occupational/vocational strand. It is where the disciplinary know-how is made relevant for the particular vocational area via content recontextualization to become occupational knowledge, and this is then used in the vocational practices such as P1 in the aviation industry, P2 in gas fitting services, and P3 in health and social care.

Related to the pedagogic and occupation recontextualization processes is another type of knowledge – work knowledge. For teaching, this refers to knowledge of the educational institution. It can be the modus operandi of the particular FE college of P4, a female lecturer of fashion and textiles in an FE college where innovative pedagogic practices were encouraged. They included field trips to the Alexander McQueen exhibition at the Victoria and Albert Museum, London, and holding of thematic fashion shows on *Queen Elizabeth 1* and *Petrushka*. P2 uses IT software such as SOCRATIVE of crossword games and questions to encourage his students learning of the related physics and chemistry theoretical knowledge as gas fitters. In addition to an institution's pedagogic vision, other work knowledge includes the availability of a mentoring system for teaching staff, IT systems, and institutional protocols. Examples include field trips guidelines that can frame and structure pedagogic activities (Kahneman, 2012; Kemmis and Green, 2013; Evans, 2016), which may affect the pedagogic recontextualization process. Similarly, from a vocational dimension, the work knowledge includes the structures and protocols that are in place for occupational practices. They, in turn, affect the occupational practices along with the practitioners' occupational knowledge. These recontextualization activities produce modified forms of know-how. From the teaching dimension, it becomes applied pedagogic knowledge, and from the vocational strand, applied occupational knowledge.

The combinations of the modified know-how from the two dimensions – teaching and vocational/occupational – finally undergo another recontextualization process known as integrated applied recontextualization (IAP) where the related know-how is fashioned to ascertain the choice(s) of teaching strategies/approaches for application in the classroom/teaching setting. This final modified know-how is occupational pedagogic knowledge (OPK) or Occupational Teachers' Capacities (OTC). The participants use metaphors and descriptive narratives to identify their teaching approaches (Lucas et al. 2012). P2 uses terms like "teaching in conference style", "building up layer by layer to help my learners", "workshop based teaching", and "the use of analogies of tractor and bicycle types" to illustrate the impact of gas flows of varying sizes of gas tubing. P3 has a strong notion of "differentiation" to engage with her health and social care students and identifies with "Maslow's hierarchy of needs" in ensuring a safe environment in her health and social care work with vulnerable families. Participants (such as P1 and P4) mentioned the symbiotic relationships between their teaching and occupational practices. P1 and P4 encapsulated the IAP process where "both teaching and occupational know-how are reflected in the specifications".

Summary

This study focused on how vocational deliverers used their teaching know-how to teach on work-related provisions in the TVET sector. In delineating this investigation and using circumscribed accounts of the relevant literature sources on knowledge and recontextualization processes, this chapter offers some contributions. Firstly, teaching know-how is defined broadly to include experiences, vocational practices, abilities, capacities, skill sets and judgement. Secondly, a conceptual framework of TVET/occupational pedagogy of teachers is offered using five types of recontextualization processes and thirdly, a definition of occupational pedagogic knowledge or occupational teachers' capacities is offered. Lastly, a deeper understanding of how TVET teachers acquire, make relevant and apply their know-how from the curriculum development stage to the choice and use of pedagogic strategies in

particular teaching contexts is explicated. These contributions have implications for users such as teachers, managers and teacher educators of TVET provisions, and policy makers. For educators, a clear understanding of the sources and types of teaching know-how legitimises and supports them in their complex pedagogic activities with clear implications for their continuous professional development. Managers and teacher educators need to include the eclectic definition of teaching know-how into their managerial and teacher training planning and implementation processes to support the teachers and ultimately, to enhance the learners' learning. Policymakers need to offer financial and pedagogic structures to facilitate the teachers' pedagogic roles in the teaching institutions, provisions and the relevant work settings with the aim to provide credible TVET provisions.

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