Doing it for themselves: A network analysis of vocational teachers' development of their occupationally specific expertise

Doctor in Education

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Abstract

This study explores how vocational teachers in English Further Education (FE) colleges maintain and develop their subject and occupational expertise. Actor-Network Theory (ANT) is used to offer an alternative conceptualisation of vocational teachers' continued professional development (CPD) as it enables the complex networks and relations between the various actors of CPD to be mapped. In particular, this approach makes visible the alternate and competing worlds of CPD that teachers and their employing colleges inhabit. A three stage inductive mixed method research approach, congruent with ANT was taken. The first stage involved a questionnaire survey of teachers in order to begin to map the territory. The second stage involved interviewing a sample of respondents to the questionnaire, to elicit their views and perceptions. The third stage 'followed the actor' of CPD so as to understand how teachers, on the ground, maintain and develop subject and occupational expertise. Through the application of ANT concepts of multiple worlds and realities, the different worlds teachers engage with to develop occupational expertise emerged. By following the actor of teacher CPD activities two things were made explicit. First, three key drivers for teachers were identified: a) passion for subject or occupational area; b) maintaining occupational currency; and c) improving teaching and learning. Second, the mechanisms that teachers use and the networks they engage with outside of their employing organisation became apparent. It is through the different conceptualisations produced by the alternate worlds that barriers to CPD emerged. Nevertheless, it is evident that teachers act with agency and, despite the barriers identified, work hard to maintain their subject and occupational expertise. They do this in spite of, not because of organisational approaches to their professional development.

I hereby declare that, except where explicit attribution is made, the work presented in this thesis is entirely my own.

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This work is dedicated to my father, Harry North
16th December 1932 – 25th May 2010

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The reflective statement

My focus throughout my studies on the EdD has been the impact on teachers in Further Education (FE) colleges of the policy agenda in England to 'professionalise' them. In September 2001, for the first time since colleges were established from the late 19th century onwards, FE teachers were required by law to gain a teaching qualification (Statutory Instrument, 2001). This was later amended in 2007 in the new regulations that required all new teachers to gain not only a teaching qualification but also qualified status (Statutory Instrument, 2007a). Alongside this, an additional statutory instrument (Statutory Instrument, 2007b), required teachers to register with the Institute for learning (IfL) and carry out 30 hours of Continued Professional Development (CPD) each year, a record of which was to be maintained and submitted to the employer and IfL. As a teacher educator, working at the Institute of Education, I had a clear interest in how the requirements for teachers in the sector to gain Qualified Teacher Learning and Skills (QTLS) status would impact on the Initial Teacher Education (ITE) team, and our students. I have also had a long-standing concern that once students complete their initial teaching qualification, their professional development needs are neglected. I hoped that the new legislative requirements would focus attention on this neglected area and that teachers would be offered the opportunities to develop their professional skills. At the same time as the legislation was being implemented, the then Labour government established a network of Centres for Excellence in Teacher Training (CETTs). I was appointed as a project manager for the London Centre for Excellence in Teacher Training (LONCETT). This further crystallised my professional concerns. I worked with experienced practitioners trying to square the circle of how to develop a culture of Continued Professional Development (CPD) that would support meaningful professional development which met both the professional needs of teachers and the organisations that operate in the complex and complicated landscape of FE. This includes providing for

students from 14 to over 80 years of age and offering programmes from pre-foundation to degree and professional level across a range of vocational and academic subjects.

One key way in which I developed my thinking and research interests was over the engagement with the four courses that marked the start of the EdD journey. Two of these were focussed on research methods and two on identifying and working with theory and concepts. In the two theoretical courses, I was able to link policy and wider debates to my own professional interests. For the first assignment, Foundations of Professionalism, I examined the extent to which the new professional agenda was likely to be successful. This enabled me to develop in two ways. Firstly, having not written for academic purposes since completing my MA in 2002, I found writing this assignment helpful in enabling me to re-engage with academic conventions. Having received positive feedback from my tutor and further developing my writing, I gained a B grade. This boosted my confidence in my writing abilities and I felt much surer of my skills when approaching the second assignment. Secondly, this first assignment opened up new areas of thinking and critical analysis. I revisited literature and concepts familiar to me, such as the seminal work by Randle and Brady (1997a; 1997b) that explored the impact of new managerialist approaches within FE. I developed greatly in my thinking through being able to bring other theoretical approaches to bear such as Ball's (2003) concept of performativity.

For the second assignment, I developed a research proposal, the focus of which was to explore FE teachers' professional identity within the context of the new professionalisation agenda. Initially I misinterpreted the purpose of this and my draft assignment was too theoretically focussed and therefore too abstract and with not enough practical application. For the final submission, I gained an A grade by responding to the feedback given. The experience of 'getting it wrong' taught me much about reflecting on the purpose of what I am writing, and the audience it is for. It also made explicit for me that essentially research is a

practical process informed by theory, not the other way round. Through this assignment, I also developed a broader understanding of approaches to research and the wide range of methodology that can be deployed in interrogating an issue. Having taught research methodology at degree level, I expected to be reasonably *au fait* with approaches to research and investigation, but having being introduced to grounded theory (Glaser and Strauss, 1967), I was excited about what this approach could offer and planned to use it within my Institutional Focussed Study (IFS) and thesis.

The third course also focussed on research, affording the opportunity to plan and implement a small-scale enquiry. Again following the professionalisation agenda, I focussed on the development of teachers and in particular mentoring, or work-based support. This enabled me to focus on yet another strand of the professionalisation agenda, this time exploring work-based support offered to trainee teachers. This has often been neglected even though the 2007 legislation (Statutory Instrument, 2007a:3) stipulates appropriate support, determining that it, "...includes mentoring and direction in the processes and practice of teaching, including lesson planning and course development". At the time of writing the research up for this module, Ofsted (the Office for Standards in Education, Children's Services and Skills) noted that work place support through formal mentoring was still in an early development phase (Ofsted, 2009; Ofsted, 2008). The specific focus of this assignment was not to be on systems and structures that other work had explored (Broad, 2010; Hankey *et al*, 2008), but to build on work that explored the perceptions of the mentor support received by trainee teachers (Tedder and Lawy, 2009; Derrick, 2008).

The fourth course (Post-Compulsory Education, Training and Lifelong Learning), enabled me to set the groundwork for the IFS and thesis by focussing on the post-initial training professional development of teachers. I began from a structuralist perspective in order to problematise the issues around FE teachers'

professional development, situating the analysis within the context of their current working conditions. This was used to explore how contractual and practice issues may negatively impact on emerging models of teacher professional development. This was then contrasted with more collaborative and democratic approaches to professional development in order to propose a more beneficial and effective model of teacher professional development.

The four courses aided my development in two ways: firstly, in how I understood the FE sector and the possible lenses for analysis that theoretical concepts offered; and secondly, in the range of research methodological approaches that could potentially be used to explore phenomena. This then informed my approaches to, and the focus of, the IFS. In line with my professional concerns, I took the opportunity that the IFS offered to make contact with students who had previously studied for a PGCE for the Post Compulsory Sector to find out how they had continued with their professional development as teachers. The IFS served as a pilot study for the main thesis as I identified that, of the three drivers for CPD, the main one highlighted by teachers was the maintenance and development of subject and occupational expertise. That this emerged so strongly from the research was interesting as there appeared to be little policy interest in this area. There is also very little current research on FE teachers' professional development activities, particularly in relation to developing subject and occupational expertise. However, some tentative explorations are beginning to emerge, which I examine in Chapter Two of this thesis. This thesis has given me the opportunity to explore this gap in knowledge and understanding and has enabled me to identify further, perhaps more effective ways teachers employ to develop and maintain subject and occupational expertise.

One of my main development points that I wished to address through both the IFS and thesis was to extend and build upon my research expertise. With this partly in mind I used a 'mixed-methods' and 'flexible' (Robson, 2002) approach

to enable me to gain experience in collecting, handling, analysing and presenting both quantitative and qualitative data. However, at the same time this choice has also been informed by my ontological position as a researcher and that I developed through my engagement with literature concerned with research approaches, that there is no objective 'truth' to be discovered through research. This stance is aligned to that of Cohen *et al* (2000) who claim that social reality is framed by perception. It is not objective in nature or viewed as 'out there' in the real world. Through all the EdD research activities, I have developed the ability to work within ethical frameworks and boundaries at all stages of the research through collection to presentation of the data. I have also used both SPSS and NVivo in analysing data and have developed my skills and confidence in using both these software packages.

Perhaps the most important skill that I developed through the research is the confidence to move out of my comfort zone and to explore data and findings using conceptual tools that are new to me. In both the IFS and thesis, I adopted an Actor-Network Theory (ANT) approach to both data interrogation and presentation.

In summary, the EdD has been an interesting and deeply changing journey. Barnacle and Mewburn (2010) state that completing a doctorate is not just about developing expertise but is also concerned with a change in identity. I do feel that this is the case for me. Not only have I developed a range of skills as detailed above, that include my understanding and knowledge of research and theory, but my identity has changed. I have become not only a practitioner in the sector but a researcher who focuses on the sector. Through this I hope to be able to effect some change for the better for everyone involved in the FE sector.

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Chapter One: An initial statement of the problem

Introduction

This thesis explores how vocational teachers in Further Education (FE) colleges in England maintain and develop their occupational expertise, and related pedagogical practices. How teachers go about this in practical terms is by and large little understood. Unlike the substantial literature available on school teachers' professional development, there is little available on FE teachers, and even less on vocational teachers. Some recent studies have, however, focussed on Continued Professional Development (CPD) from an organisational perspective (see for example, Orr, 2009; Wooding, 2007) and there is some research about particular groups of vocational teachers, with Bound (2011) exploring the CPD needs of Australian construction teachers and Lloyd and Payne (2012) conducting a comparative study of hairdressing teachers.

This underdeveloped understanding is of particular concern as between 2007 and 2012, FE teachers in England were required by legislation to undertake CPD. What I am calling here the professionalisation agenda began with the introduction of legislation in 2001 that, for the first time since colleges began to be established in the late 19th century, required all new FE teachers, apart from those teaching solely on Higher Education (HE) programmes, to gain a teaching qualification (Statutory Instrument, 2001). This move was strengthened through further regulations in 2007 that required FE teachers, post qualification, to gain either Qualified Teacher Learning and Skills (QTLS) status, or Associate Teacher Learning and Skills (ATLS) status, dependent on their particular teaching role, although again, this did not apply to HE teachers in FE (Statutory Instrument, 2007a). This strengthened legislation also required

colleges to offer support, in the form of mentoring, to their teachers as part of the initial teaching qualification.

More importantly for this study, is that teachers were required by 2007 regulations to register with the Institute for learning (IfL) and carry out 30 hours of Continuing Professional Development (CPD) each year (pro rata for part-time staff), a record of which was to be maintained and submitted to the employer and IfL. Significantly, the legislation offered two reasons why teachers should engage with CPD and states:

> *"CPD", in relation to a teacher, means continuing professional development, which is any activity undertaken by him* [sic] *for the purposes of updating his knowledge of the subjects he teaches or developing his teaching skills.* (Statutory Instrument, 2007b:1).

This concern with the development of 'subject' specific expertise is encapsulated within the policy literature from which the legislation developed. The then Department for Education and Skills (DfES, 2002), under the previous Labour government, identified that there was insufficient emphasis on the development of subject specific knowledge and teaching skills. In a report calling for reform in FE and training, the DfES pledged to, "...ensure that staff have the opportunity to update their subject expertise." (ibid, 2002:19). Two years later, the DfES (2004) promised to ensure that all teachers were trained and qualified in the subjects that they teach. However, eleven years on, the current Coalition Government have also claimed that there are continuing problems with the development of subject specific skills, at least for vocational teachers, as evidenced in its response to the Wolf Review of 14-19 Vocational Education (2011). The government's response stated that vocational education was characterised by, "...indifferent teaching of highly specialised subjects from teachers who are not well enough versed in the courses they are leading." (DfE, 2011:2).

However, in 2012, another government commission's review, this time of FE teachers' initial training and professional development (the Lingfield Review) recommended that, whilst FE teachers should continue to engage with a minimum of 30 hours of CPD per year, this should be driven, not by legislation, but through the requirements of funding bodies. As a consequence, in September 2012, the 2007 regulations were revoked (Statutory Instrument, 2012), removing the legislative requirement on teachers to engage with CPD.

It seems that conceptualisations of teachers' professional development within the legislation, its subsequent implementation, and revocation, were that it was simple and unproblematic. However, professional development is complex and highly individualised. It is dependent on a range of variables such as context, subject or occupational area taught, the development needs of the individual teacher at a specific moment of time and at a specific point in their career. These needs will change as the teacher develops and enhances their professional knowledge. Professional development can therefore be defined, for the purposes of this study, as any activity carried out in order to develop the skills and knowledge needed to deepen understanding of the subject or occupational area taught, so as to enhance teaching and learning, whether consciously or not. Unless it is known and understood what teachers already do in terms of CPD, what they find to be beneficial and why, there is a real danger that what emerges is activity for activities' sake, especially within the performative (Ball, 2008) cultures currently found within FE. Indeed, the two 2007 statutory instruments led to a flurry of activity and attention from many stakeholders and interested parties. The government provided time-limited funding for Centres of Excellence in Teacher Training (CETTS), situated in Higher Education Institutions (HEIs). These were tasked with enabling the FE sector to implement both the requirements for CPD and the redrafted requirements for initial teaching qualifications. Colleges, through their human resource (HR) and staff development departments, provided CPD opportunities for their staff to

ensure that they were able to comply with the legislation. However, I had found in my previous research (Broad, 2011) that teachers judged the CPD activities provided by their colleges to be too generic to be able to meet their particular development needs. The non-specific nature of much of this provision meant that teachers often found little relevance for their own practice and that it had little application to the needs of their students. These CPD opportunities also tended to focus on organisational needs, rather than individual professional needs. In other words, they were staff development opportunities, focussed on organisational improvement, rather than professional development opportunities (Trorey, 2002) focussed on more nuanced needs.

The problems of implementation identified above are in part due to the complex and heterogeneous position of vocational teachers. These teachers are individually concerned with a particular occupational area and are situated within a range and variety of learning sites. These include classrooms, workshops, and specialist simulation areas, such as kitchens for trainee chefs and flight decks for trainee aircraft engineers.

This is overlaid by the complexity of the sector itself which makes it impractical to provide formal mechanisms for teachers to engage with their own occupational areas. Even though professional development is presented in the professionalisation agenda policy documents as simple and unproblematic, elsewhere in policy discourse the barriers presented by complexity have long been recognised, even if not fully understood. For example, in order to develop an outsider understanding of the FE sector, the Labour government had commissioned the Foster review (2005). This noted that the FE sector has three core areas of work, "...building vocational skills, promoting social inclusion and advancement, and achieving academic progress." (ibid, 2005:22). What this means is that colleges teach traditional vocational courses, lower level entry courses, and GCSE and 'A' level courses. However, even this detailed analysis

did not fully capture the complexity of what FE colleges do. Alongside the provision identified by Foster, there are also professional programmes such as human resource management and accountancy, foundation degrees, courses for students with disabilities, both learning and physical, and even though they are not fully funded, the sector also delivers recreational courses such as photography and pottery. The age range of students is from fourteen to beyond retirement. Dealing with this complexity and meeting the subject and occupational CPD needs of teachers engaged in teaching across this is a tall order (Huddleston and Unwin, 2013). Indeed, my previous research (Broad, 2012a), identified that in the most part, CPD activities provided by colleges take the form of attendance at short, internal, non-accredited, generic courses which do not take account of the complex needs of FE teachers and their professional development.

A statement of the aims and conceptual approach

This thesis is concerned with how CPD should be organised so that it meets the needs of teachers and serves the practical purpose of enabling them to develop their knowledge, skills, understanding and subsequently their pedagogic practice. Unless we have an understanding of this, it is problematic to begin to plan for, or even recognise, what 'good quality' CPD is. It also suggests that the ways in which teachers develop expertise related to their occupational area is much more complex that the simplified understanding within the legislation and subsequent organisational approaches to it. This research, therefore, aims to begin to fill this gap in both the literature and in practice by identifying the ways in which vocational teachers maintain and develop their occupational knowledge and skills. Defining this more succinctly, the aim of the study is to:

- Identify the ways in which vocational teachers in FE colleges maintain and develop their occupational expertise and knowledge.

However, this is not an easy task for a number of reasons intrinsically linked to the nature of what it is that vocational teachers do. First, we have to consider the complex and heterogeneous nature of vocational education and training as described above. Therefore, each teacher's professional development needs and practices will be unique to them. Second, what these teachers attempt to do in developing their occupational expertise, is to link back to and learn from, the original occupational site and context. In other words, what teachers need to know and develop is situated within particular 'other' contexts. This means that activities will be multiplicitous and complex. It is therefore important to recognise and then map this complexity in order to develop a conceptual framework that enables activities and network connections to be mapped. Actor Network Theory (ANT) offers a particularly useful conceptual framework here (see, *inter alia* Law, 2007; Mol and Law, 2002; Latour, 1987; Callon, 1986a). It offers a way of making visible the webs of relations that teachers engage with. It is the relational qualities of ANT that are important here, as ANT's distinctive offering is, "...in overcoming the descriptive resistance to dealing even-handedly with persons, things, artefacts and so forth together." (Strathern, 1999:156). This conceptual approach has in part shaped the specific research questions that this study addresses.

To fully explore the complexity I have begun to allude to, and to uncover the ways in which teachers operate and at the same time, to capture the 'lived experiences' of these teachers, I needed to pose a further set of research questions:

a. To what extent is the maintenance and development of occupational expertise important to vocational teachers and if so, why?

b. To what extent do vocational teachers believe that the continued development of their occupational expertise impacts positively on their pedagogical practice?
c. What activities do vocational teachers engage with to develop occupational expertise?
d. What organisations, bodies, companies, individuals or other institutions do vocational teachers engage with whilst carrying out these activities?
e. Where are the learning sites at which these activities take place?
f. To what extent do the vocational teachers' employers (the colleges) support their CPD activities?
g. To what extent are activities for vocational teachers heterogeneously different to those of other teachers?

Summary and structure of the thesis

This introductory chapter has outlined the rationale for the thesis. It has argued that the topic of vocational teachers' continued development of occupational expertise is little understood and that it is conceptualised within policymaking and legislation as being simple and unproblematic. However, as I have begun to suggest here, it is far more complex and also situated within alternate and multiple contexts and sites.

The remainder of the thesis is divided into six further chapters. The following chapter begins the journey of understanding vocational teachers' CPD by exploring a range of contexts within which teachers enact their professional development that includes a brief historical review, a discussion of some characteristics of vocational teachers and their professional learning which includes how vocational education and training is conceptualised, the

contextualisation of vocational teachers as situated within both occupational and learning sites and a brief review of professional learning. Chapter Three presents the theoretical and conceptual framework and is divided into two main parts. The first part extends the review of teacher professional learning from Chapter Two by examining how vocational teachers' professional learning is conceptualised and how this in turn is shaped by understandings of what is meant by vocational knowledge and learning. Following this is a brief exploration of the ways in which organisational and structural arrangements impact on teachers' CPD and how this can present barriers to engagement. The second part of Chapter Three develops an alternative way of conceptualising and analysing vocational teachers' professional learning through using Actor Network Theory (ANT). It presents a range of ANT tools that are used to explore both within and beyond the multiple and complex worlds of teachers' CPD. Chapter Four explains the research methodology used to gather data and Chapter Five presents the findings from a questionnaire survey of FE teachers. In order to address the research questions, Chapter Six discusses the findings within an ANT informed conceptual framework and is divided into three sections. The first section identifies the mediators that drive teachers to engage with CPD for occupational development purposes. The second examines the ways in which teachers maintain and develop their occupational expertise. This section also discusses the important role that professional associations play in providing forums and mechanisms for CPD for some teachers and also learning opportunities for their students. The third section sheds light on the barriers that teachers face when attempting to develop their occupational expertise. In Chapter Seven, conclusions are drawn from the discussion and are presented in response to the seven research questions. Key recommendations are given and the thesis evaluated.

Chapter Two: Researching CPD in context

Introduction

This chapter explores a range of contexts that shape and influence the nature of vocational teachers' CPD and is divided into four sections. The first section offers a brief history of vocational teachers' CPD through tracing significant policy milestones. It identifies three persistent and interrelated concerns regarding the way in which vocational teachers' professional development is planned for and supported. The second section discusses some key characteristics of vocational teachers and their CPD. It explores how vocational education is conceptualised and how this in turn impacts on CPD. The third section discusses the contextual position of vocational teachers who are uniquely situated between learning sites and occupational areas. It offers explanations as to why dual identity is important for vocational teachers in both their teaching of students and their professional development. The fourth section explores the literature concerning teacher professional learning and considers the extent, and ways in which, vocational teachers' professional development is essentially different from that of other teachers.

A brief history of teachers' professional development in England from 1944 to the present

There have been repeated calls over the last 50 years for teaching and learning improvements in FE colleges (Colley *et al*, 2007). However, this has never been addressed in terms of professional development and compared to their colleagues in schools, vocational teachers and their professional development have historically been largely absent from government rhetoric about improving

the quality of vocational education and training (Hodkinson, 1998). Of significance here and emerging from the following analysis, is that there are three recurring and interrelated concerns regarding the organisation of teachers' professional development (from both academics and policymakers) that are still largely evident today. The first is how little attention has historically been paid to vocational teachers' professional development, especially in contrast to their counterparts in schools. This is in part because of the insecure and part-time contractual employment arrangements for FE teachers and reflective of the low esteem afforded to vocational education. The second is the ways in which professional development has been situated and contextualised, in other words, where it takes place and how it is structured. The third is how CPD is funded and this has moved from central, to Local Education Authority (LEA) control, to individual colleges. This shift over time has shaped the support for professional development historically offered to vocational teachers.

Up until 1944, full-time training for technical teachers did not exist (Webster, 2012). According to Bailey (2007), technical training in colleges was mainly carried out by part-time, rather than full-time teachers and colleges tended to view releasing teachers for training as inconvenient and financially unattractive. However, a new, slightly more favourable phase of teacher development began with the 1944 *Education Act*. For the first time, this envisaged a cohesive education and training system of primary, secondary and further education. Alongside this was introduced localised planning for FE through the new LEAs. These LEAs were tasked with planning and providing the full-time and part-time further education provision within their boundary area. Significantly, enshrined within the Act was the establishment of the Ministry for Education, led by a Minister of Education, invested with the power to plan and provide training for teachers. However, unlike for schools, this was never enacted for FE teachers. What the Act did accomplish, however, was to give political focus to FE

teachers' training needs. The McNair Report (1944), which followed quickly on the heels of the Act, recognised that the situation was not ideal and argued that the time was ripe to introduce a system of training for technical teachers. The report stated that provision for initial teacher education should be situated within technical colleges and taught by technical teachers. Arguably, this aimed to address the difficulties of providing contextual and specialised teacher education. Over 60 years later, this lack of specialised knowledge is still seen as a problem by policy makers and is a central theme in much of the policy surrounding the 2007 legislation (see for example, DfES, 2004).

In 1972, the James Report reignited debates around teacher professional development and a holistic and developmental, three-strand approach was suggested. Firstly, there was a proposal for a wide range of rich professional development activities. These ranged from evening meetings and discussions, weekend conferences and other short-term activities, to long courses leading to higher degrees and advanced qualifications. Additionally, periods of secondment to fields outside teaching to widen individual's experience were suggested. Secondly, whilst much of the report focuses on the compulsory sector, towards the end it makes it very clear that FE teachers should be treated no differently to their colleagues in schools:

> *In the same way, each FE college should have a suitably qualified member of staff designated as its professional tutor, with similar responsibilities for drawing up a training programme for its staff, All FE teachers in full-time service should have the right to third cycle* [CPD] *facilities on a scale not less than that suggested above for teachers in primary and secondary schools. (James Report, 1972:13. para 2.26)*

Third and perhaps most importantly, the James report also recognised the needs of the large number of part-time teachers in the sector:

> *The many part-time specialist teachers who work in FE should have opportunities to take suitable part-time courses of education and training. (ibid 1972:13. para 2.26)*

This has particular resonance today given the continuing casualised nature of contractual arrangements for FE teachers. These arrangements manifest in a highly insecure workforce that has a higher percentage of part-time and casual staff with the exception of hospitality, than any other sector of the economy (Wallis, 2008).

As a consequence of the James Report, the late 1970s saw a considerable increase in the provision of staff development in colleges. However, it was not entirely as envisaged within the report which suggested the setting up of regional professional centres. Rather, many colleges appointed staff development officers to promote and co-ordinate CPD (Cantor *et al*, 1995). Nevertheless, at this time, LEAs were still very much involved in the professional development of FE teachers and provided them with additional development opportunities.

The opportunities afforded by the James Report (1972) were continually built upon and developed thus, by the mid-to-late 1980s, the provision of staff development was diverse and mature. There were over a 100 centres providing FE staff updating opportunities in specific vocational and curricular areas (Professional Industrial and Commercial updating, 1986). There was also the Further Education Staff College (at Coombe Lodge near Bristol) which came out of the Willis Jackson Report (1957). Although traditionally providing training to managers, Coombe Lodge increasingly offered what was known at the time as in-service education and training (INSET) to 'other ranks' (Professional Industrial and Commercial updating, 1986). To support this varied provision, there were three sources of funding; from the Department of Education and Science (DES), LEAs and colleges themselves, who were expected to provide for some staff

development events such as conferences, short courses and seminars out of the existing college budget.

However, these halcyon days were relatively short-lived and the late 1980s marked a sea change for the sector, reflected in the provision of CPD. According to the FEU (1986), the focus of FE teachers' professional development turned to specific organisational needs, as colleges were forced to respond to policy change, in particular the Youth Training Scheme (YTS). The YTS scheme was preceded by a similar, but short-lived scheme, the Youth Opportunity Programme (YOP). The impact of YOP programmes on colleges and their teachers is recounted by Unwin (2004:182) as, "The unemployed young people who poured into colleges of further education..." The issue, she argues, was that these new students were unlike the traditional day-release apprentices that colleges were used to teaching and they presented, "...a considerable pedagogic and curriculum challenge." A second change was that for the first time, teachers were strongly encouraged to record their CPD activities. An example of this approach was that the FEU (1987), produced a self-profile for teachers to record their CPD. This was an early example of what was later described as new managerialist approaches (Randle and Brady, 1997a), to the organisation and management of FE colleges that marked the emergence of a target driven culture impacting on teachers as encapsulated in Ball's (2003) concept of performativity. In terms of CPD, this approach emerged again in the 2007 regulations that required all teachers to maintain a record of their CPD.

The final dismantling of the relatively rich provision of professional development came with the *Further and Higher Education Act* (1992). This removed control of colleges from LEAs. Colleges were 'incorporated' on April 1st 1993, transforming them into free standing corporations. The implication of this was that the varied funding streams for professional development set up by the James Report (1972), disappeared almost overnight. Financial control for all

aspects of the running of a college was devolved directly to senior managers and board of governors in individual colleges and of course, this included funding for professional development. This meant that all CPD previously provided by and through LEAs ceased.

Consequently, as provision was determined by each college, it varied widely. For example, according to Cantor *et al* (1995), London colleges devoted varying sums to staff development from one to four percent of their total budget. Compounding the repositioning of CPD as being a direct college expense, colleges were also responsible for CPD for all their staff, not just teaching staff. As a consequence, many colleges adopted a 'whole organisation approach' and what money was available was diffused through the whole organisation. This led to the emergence of short, in-house, workshops and conferences. These were, on the whole, delivered by internal staff to keep costs low which meant that CPD opportunities became more insular, with less opportunity for vocational teachers to network outside of their organisations.

This analysis shows that there are three problematic and persistent challenges to the planning and provision of CPD for vocational teachers. These are: a) the impoverished nature of vocational education and the subsequent impact of this on vocational teachers; b) how their CPD should be organised and structured; and c) how best to fund and support it. These three issues still impact on current arrangements for vocational teachers' professional development opportunities.

The above review shows that whilst there were periods of policy interest and intervention, it was never sustained. This lack of sustained interest from policymakers has led to the sector being described as the 'Cinderella' of the education service (see, *inter alia*, Jephcote, *et al*, 2008; Edward, *et al,* 2007; Bathmaker and Avis, 2005a; Bathmaker and Avis, 2005b; Randle and Brady, 1997b). Yet, paradoxically, according to Avis (2009), the FE sector has in recent

years, been subjected to 'policy hysteria'. This is in part a result of cutting colleges free from local control and subsequent government attempts to regain more centralised control. It is also in part due to concerns about the UK's levels of skills when compared to international competitors (DBIS, 2011; Leitch, 2006; DfES, 2005). Colleges are called upon to play a major role in raising skills levels and, in order to do that, they are also required to ensure their teachers have the necessary expertise. For example, Foster, recommended that the DfES produce a workforce development strategy that focussed on, "...improved and consistent continued professional development including improving vocational expertise." (Foster, 2005:75).

However, it is not clearly known or articulated what it is that vocational teachers do, or need to do, in order to maintain and develop their vocational expertise. My main argument throughout this thesis is that the professional development needs of vocational teachers are different from those of other teachers, mainly in that they are teaching applied and contextual knowledge and skills. There is also a high level of currency in many occupational areas, with techniques and approaches subject to constant change and adaptation. This means that teachers need to link back to the original occupation to ensure that they are continually refreshing their understanding in context and keeping abreast of these industry changes. The following three sections develops this contextualisation further by exploring the characteristics of vocational education and vocational teachers in a little more detail, positioning vocational teachers as necessary links between learning and occupational sites and reviewing some key literature on teachers' professional learning.

Some characteristics of vocational teachers and vocational education

The purpose of this section is not to offer authoritative definitions of what vocational education and training is. Rather, it serves to explore how vocational education is conceptualised and positioned and how this subsequently impacts on the organisation of CPD. The first conceptualisation I want to address was first articulated in the preceding section on policy history that 'technical' or vocational provision has long suffered from low esteem. This is partly due to vocational education and, therefore, vocational teachers, being positioned negatively within a deficit model of education, which is subsequently seen as an inferior and second best route for many young people. As Billett (2011:2) explains, large parts of vocational provision are, "...reserved for those with poor outcomes from schooling, and who are unable to secure access to higher forms of education." The consequences of this are explained by Misra (2011), who compares vocational teachers to other teachers within Europe. She states that their role as vocational teachers and educators is often overshadowed by their colleagues teaching general education due to the greater emphasis placed on both academic education and credentials.

Within this conceptualisation of vocational education as a deficit model, can also be seen crude Cartesian dualisms of theory/practice and skills/knowledge (Moodie, 2002). There are three main interrelated problems of adopting these Descartian dualist approaches to the understanding of education and training. First, it reinforces notions of a vocational and academic divide whereby one is seen as practical, applied and somehow worth less, and the other as rarefied, pure and somehow preferential. Positioning vocational education in this way allows justification, if not explicitly then implicitly, for less favourable funding of vocational provision. Fletcher and Owen (2005), offer an analysis of the ways in which different funding levels within schools and colleges lead to FE provision

being significantly underfunded in comparison to schools. Consequently, colleges who cannot, like many schools, draw funding from the local authority for CPD, have to fund teachers' CPD from contrastingly impoverished budgets.

Second, it shapes vocational education and training as narrow and instrumental. Whitty and Willmott (1991), explain this narrow characterisation as the ability to perform a task against a set of criteria. This, according to Winch (2000), positions vocational learning within behaviourist models, whereby education is seen as little more than conditioning. This then leads to the third problem, wholesale adoption of competence based approaches to teaching and learning that view it as simple transmission of decontextualised and codified knowledge. This in turn heightens control over teachers by turning the focus to the regulation of outputs and performance and away from inputs, of both knowledge and culture (Jones and Moore, 1993). The concern is that, as shown earlier, this has led to CPD provision that is similarly conceived as simple and unproblematic. Subsequently, it does not meet the development needs of these teachers. I return to this more fully in the following chapter, exploring more fruitful and beneficial ways of organising CPD. First however, I want to explore how vocational teachers can be identified as crossing boundaries and situated between learning and occupational sites.

Linking learning sites and occupational sites

The role of vocational teachers is to teach their students occupationally specific skills and knowledge, and to enculturate them into a specific occupation or industry. In this way, they can be seen to act as a bridge for their students between the two worlds of learning and occupation. As professionals, vocational teachers have dual identities, as a teacher and also as an expert within a specific field. Felstead *et al* (2010), define identity as a perceived sense

of belonging to a social entity, such as an occupation. Because of the way in which teachers bridge teaching and occupation, they by necessity belong to two social entities and therefore have two distinct but interrelated identities. The importance of recognising this is explained by Nespor (1994:11), who, reflecting on undergraduate students and how their professional identity is forged states:

> *People need labs, notebooks, computers, equations, and colleagues to be 'physicists'; suits, offices, memoranda and organizations to be 'mangers' (and the whole pathway that leads people into configurations with these elements is the key here, not just possession of them). Drop a student of physics or a manager on a deserted island without their tools and colleagues and the questions of what they 'know' and in what sense they've learned are rendered moot.*

This particular conceptualisation of the nature of professional identity enables a more nuanced understanding. It makes apparent that vocational learning is not just concerned with transmission of occupational knowledge and skills, but also with a web of relations, assembled as an individual becomes an expert. Significantly for teachers' CPD, it means that what is learnt it is not something that can be possessed and taken simply and unproblematically from one place to another. Therefore, once a practitioner moves away from a particular occupation, the web of relations that they were part of, disassembles.

In practice, therefore, CPD by necessity, needs to focus on keeping 'alive' this occupational identity. However, the problem this raises for the organisation of professional development is that vocational teachers are drawn from many occupational backgrounds and arrive with very convoluted and interesting histories (Jephcote *et al*, 2008). This particular conceptualisation raises issues, however, of how vocational teachers are perceived. For example, Spenceley (2006), suggests that FE teachers have little homogeneous identity and rather

than an allegiance to the teaching profession, allegiance often remains with the original profession and alludes to this being a detrimental position. Similarly, in an earlier and much quoted study, Robson (1998), even though she recognises that it is the occupational identity that gives FE teachers their credibility as teachers, also sees it in unfavourable ways. She suggests that it leads to a fragmentation of the sector and similar to Spenceley, it also leads to there being no clear collective professional identity.

Whilst these two issues may generate problems in other areas, in terms of professional development and improving teaching and learning, that teachers hold an identity developed within the original occupation is essential. It may not make for a homogenous FE professional identity but is encapsulated in the complexity that I am attempting to portray here. The challenge therefore, is not to try and forge a homogenous professional identity but to recognise vocational differences and then work to develop mechanisms that support teachers in keeping alive their original vocational identity.

Teacher professional learning

Since 2010, two government agencies, the Quality Improvement Agency (QIA) and the Learning and Skills Improvement Service (LSIS), have been tasked with, "...accelerating quality improvement." (LSIS, 2010:1). Prior to that, significant amounts of money had begun to be spent. For example, £30 million was paid directly to colleges and other providers in the academic year 2007 to support workforce development (LSC, 2007) and a subject learning coach initiative, which, according to Coffield and Edward (2009), had little noticeable effect on teachers' CPD. These and other initiatives have in turn attracted the interest of researchers, most significantly in identifying the ways in which policy has shaped practice.

Initially, this interest focussed on structural and organisational issues. In a study with human resource managers in FE colleges in the north of England, Orr (2009:485) stated that none of his respondents, "...indicated that it [the CPD requirement] had made a significant difference to practice." Instead, the requirement had encouraged the implementation of systems to record CPD and only two organisations in his study had not implemented systems for recording CPD. These systems included, "...master spreadsheet[s]...databases...and 'frameworks'." (ibid, 2009:486). In a similar study in London, Wooding (2007) found that the CPD requirements were being linked into existing quality assurance mechanisms and staff appraisal systems, a relatively recent move as prior to the legislation, staff development tended to sit outside of human resource departments. However, in contrast, an Ofsted publication (2010) found that few organisations had formal structures for planning and organising CPD. The differences in findings between the studies and Ofsted's claim is probably because at the time they were conducted, the legislation had very recently been introduced and organisational procedures to meet the requirements had not had time to properly become established. However, how these systems actually impacted on teachers' CPD has not as yet been fully traced.

For studies that focus on vocational teachers, one needs to move outside government and policy drivers and indeed, in some instances, outside England. Bound (2011), in a study of Australian construction teachers, examined how successful CPD was in encouraging these teachers to adopt alternate pedagogic practices. The wish was that teachers would move towards a more flexible mode of teaching that utilised a range of e-tools to enable a more flexible curriculum model to be developed. She found that whilst short workshops on these e-tools inspired teachers to consider the possibilities offered through e-learning, it did not necessarily lead to a wholesale take-up of utilising these for teaching and learning. To overcome this lack of transfer from teacher

development to teaching and learning, she suggests that professional learning should be planned so that it is highly contextualised to the workplace. Whilst this study is useful in furthering understanding of the importance of both learning context and forms of CPD, the focus was concerned with the development of pedagogic and e-learning skills, rather than the development of occupational knowledge and skills. It therefore does not help in understanding vocational teachers' CPD needs for occupational purposes.

Closer to my study, is a comparative study of hairdressing teachers in England, Wales and Norway (Lloyd and Payne, 2012). This identified three ways in which hairdressing teachers maintain and develop their occupational expertise. These were, through working occasionally in a friend's salon, by suppliers of hairdressing products running workshops in the college salons and, through collaborative learning within the college by sharing ideas and reflecting on practice. Whilst the identification of these approaches are useful to some extent, I suggest that these forms of CPD may not offer rich experiences and, therefore, not fully benefit teachers in their professional development due to the relatively narrow nature of these types of activity. The first type of CPD activity will be dependent on the type of work that a salon does. It may be that it works at the cutting edge so to speak, but it may also be a salon that serves a local community, providing an everyday service. In this instance, whilst the teacher will be able to 'keep their hand in' and maintain a commercial speed, they may not necessarily be able to hone and develop skills to any great extent. The two other approaches are both bounded by the organisation, with manufacturers attending college, and colleagues working with each other.

These findings can be further developed here as, whilst Lloyd and Payne (2012) did allude to teachers valuing these activities as a way of inspiring students, they did not substantively explore the benefits of these activities to the teachers or their students. Exploring this in more detail, especially from the perspectives of teachers, would begin to open up the link between effective

CPD and improved teaching and learning. An area of interest that would benefit from greater exploration here is whether teachers engage with CPD for occupational development purposes because they themselves can identify direct causal links between this and improved pedagogic practice.

As I mentioned earlier, there is a relatively wide and mature body of literature on school teachers' professional development. Whilst this is not directly transferable in all instances, there is however, a rich seam of work that focuses on school teachers' professional development that can be mined for the purposes of this study. This literature suggests that collaborative approaches have long been recognised as being effective by providing the richest opportunities (see for example, Goodson and Hargreaves, 1996; Hargreaves, 1994). In their study, Hodkinson and Hodkinson (2005), found that high levels of collaboration within teaching departments bring an additional dimension to learning. It is richer and not bounded by notions of formal learning. Learning is informal and on-going whenever teachers are together through discussions, consultations, and sharing of materials and ideas. However, there are three interrelated limitations in the approaches to conceptualising and understanding professional learning presented by the literature, predicated on a dualist stance, breaking teacher professional learning into a dichotomy of either/or. Teacher professional learning is either formal or informal, and it is done in collaboration or isolation. First, these either/or approaches do not recognise the complexities of the FE sector, nor do they realise the importance of linking classroom and learning sites to original industry and occupational sites. Second, they do not take account of vocational teachers' dual professional identity, which I highlighted earlier as being important. Third, is that school teachers' professional development tends to be bounded by the school and at its widest, by the LEA. For vocational teachers, the learning site, if they are collaborating with other occupational experts, may move beyond the organisation in significant ways. What this short analysis of some of the current key literature

does is to begin to highlight the significance of understanding, and conceptualising, the nature of vocational learning and where it is situated, which now requires examination and is explored in the following chapter.

Summary

This chapter has presented a range of contexts that shape and influence the nature of vocational teachers' CPD. Through tracing significant policy milestones, three persistent and interrelated concerns regarding the way in which vocational teachers' professional development emerge. The first is how little attention has been historically focussed on the training and development of vocational teachers, which is largely grounded in fragile employment arrangements for FE teachers, reflective of the low status of vocational education. Second is in how it is situated and contextualised, where it takes place and how it is structured. Third is how it is funded, which in turn shapes the support for professional development that has historically been offered to teachers. By exploring the more recent policy interest, it becomes evident that the particular professional development needs of vocational teachers are not clearly understood. This has had a negative effect on the provisions of teachers' professional development. Finally, the conceptual and contextual positioning of vocational teachers can be seen as vitally important if they are to successfully link learning sites to occupational sites.

The following chapter begins by building on this by offering ways of conceptualising vocational teachers' professional development. It then presents the ANT conceptual framework used.

Chapter Three: Literature review of teachers' professional learning and conceptual framework

Introduction

The first part of the chapter further develops an understanding of vocational teachers' professional learning begun in the previous chapter. Here the focus moves to how it is conceptualised and how this in turn is shaped by current conceptions of both the nature of knowledge and learning, and of teachers' professional learning. I suggest why these conceptualisations may be limiting to the development of a clear understanding of teachers' professional development. Through this first section, I begin to raise some concerns regarding barriers that teachers may face in their attempts to maintain and develop their occupational expertise and, drawing on the literature, suggest ways in these barriers may be negated. The second section of this chapter, in recognition of the complex and heterogeneous nature of FE teachers and their professional development, presents Actor Network Theory as an alternative conceptual framework for exploration and analysis.

Conceptualising and situating vocational teachers' professional development

Before researching vocational teachers' professional learning, it is necessary to arrive at an understanding of what in meant by 'knowledge' and 'learning' within the vocational context. Both policy discourse and traditional approaches to knowledge and learning appear to see these terms as unproblematic and thus far, I have also used these terms in unproblematic ways. They are both

however, contested terms that require unpacking. An example of the unproblematic ways that professional knowledge and learning tend to be understood can be found in my earlier research (Broad, 2011). I found that CPD activities provided by colleges tend to take the form of attendance at short, internal, non-accredited courses that were provided either in response to policy, or to organisational needs. Occasionally, these courses were concerned with classroom practice. There was no evidence that these courses ever focussed on the development of occupationally specific skills and knowledge and teachers reported that they found these courses to be of little benefit. Driving this particular type of provision are assumptions that all knowledge can be codified and therefore transmitted to learners that then emerge, in terms of teacher professional development, as short courses delivered to teachers in straightforward and unproblematic ways.

These approaches in part, are driven by how knowledge is understood. For example, Guile (2010), argues that the conceptualisation of knowledge within government policy is abstract and seen as separate from the social practices that codify work-based knowledge. Eraut *et al (2000),* argue that much work-based knowledge, which I maintain teacher professional development is concerned with, is over formulistic, that it is planned by the providers of this knowledge in a deliberate and outcomes driven way, so that it can be easily measured. By extension, they suggest that policy makers consider the codification of professional knowledge to be unproblematic. This can be seen in the ways that teachers have been required, by the legislation, to record their CPD hours. It has, for these purposes, been codified into easily measurable hourly units. This is summed up by Eraut *et al* (2000:232), who express concern that within the current policy formalistic paradigm, for knowledge to be valued it has to be, "...assessed and codified in propositional form."

The problematic implications for vocational learning of these particular approaches to identifying and codifying knowledge can be seen in the work of

both Wheelahan (2007) and Young (2008). Wheelahan uses a Bernsteinian analytical framework of categorising knowledge as either *vertical*, esoteric, conceptual and abstract, or *horizontal*, mundane, contextual and material. She argues that competence based education and training is impoverished because it does not encompass vertical knowledge. Young, using a similar Bernsteinian framework, argues for vocational 'curriculum unification' in order to create the right conditions for acquisition and production of vocational knowledge. He suggests that to achieve this, strong classification and framing is required, and hence, that knowledge needs to be codified. He further suggests that in order to achieve this, and to bring knowledge back in to the vocational curriculum, requires the services of specialists in academic subjects. The problems here are that both these perspectives view knowledge as a hierarchy, with some forms being superior to others. They are also in danger of falling into the trap of not recognising the importance, is similar ways to policy discourse, of knowledge that is not easily identified and codified. Canning (2012:46), expresses concern with privileging one particular form of knowledge over others and argues that these approaches derive from a, "...very English discourse of knowledge..." and that these 'other' forms of lesser knowledge within the discourse are the vocational. Guile (2010), offers an alternative view that gives tacit knowledge primacy and recognises that individuals learn different types of knowledge in different ways. This is supported by my earlier findings (Broad, 2011), that suggest that for most teachers, meaningful professional development (or the learning of new knowledge) is carried out in a range of ways and contexts. This underlies Canning's (2012:58), view that vocational knowledge should be understood as 'useful knowledge'. He, however, arrives at the main problem by arguing for a new language through which to understand vocational learning and suggests this new language, "...combines the new with the old and re-invents itself for a post-industrial era."

These debates concerning the ways in which both vocational and professional knowledge is understood, is not just abstract and it has practical implications for the ways learning is understood, with codified forms of knowledge influencing traditional approaches to learning. I would argue that, to understand professional vocational learning in meaningful ways, requires a move away from siloised conceptions of knowledge as hierarchical traditional disciplines. Language in the literature is not always helpful and often researchers themselves talk about occupational areas taught in colleges as 'subjects' (see for example, Lloyd and Payne, 2012) and 'disciplines' (see for example, Loo, 2011). Whilst these short-hand uses are helpful ways of offering shortcuts to understanding and conveying concepts, I want to distance my own position from these terms and to envisage vocational teachers' professional learning more widely than these terms convey. They tie us to traditional notions of learning that focus on the individual and see learning as a formal process (Hager, 2011). A further concern with conceptualising knowledge as subjects and disciplines is echoed in those raised by Hargreaves (1991), over the ways in which teachers can become balkanised. This is similar to Christensen *et al's* (2010), concept of siloisation which they argue prevents boundary crossing. The balkanised way in which teaching staff are organised is also identified as one on the problems facing FE (Edward *et al.*, 2007). The importance of this positioning here is that for professional development to be meaningful, it may necessitate teachers crossing both organisational and siloised boundaries.

One of the problems, according to Hager (2011), of these generally accepted and traditional approaches to understanding learning, is that learning is seen as independent of context and therefore seen as being able to be transferred unproblematically to a range of diverse contexts. He challenges this by stating, "It seems that skilful practice of occupations is both holistic and significantly contextual, rather than atomistic and context-free". (ibid, 2011:22). Thus, it becomes clear that traditional approaches to understanding knowledge and

learning create problems when applied to vocational teachers. They do not address the contextual issues raised by Guile (2010). Vocational teachers spend all or some of their day-to-day working lives in classrooms and workshops that are situated, by definition, away from the practice site of the occupation being taught. This in turn, raises questions as to the effectiveness of learning new trends, knowledge and skills that are used within the occupation, away from the original and situated site where these are practised and developed.

The importance of situatedness is affirmed by vocational teachers themselves who recognise the importance of context and being able to link learning sites to original occupation sites. Teachers in Robson, *et al's* (2004) study, said that an important aspect of teaching and learning was sharing their experiential expertise with students. They brought contextual knowledge into the classroom through artefacts from the workplace, such as a childcare teacher using examples of children's work. Their teachers talked about how they brought typical and occupationally situated norms and values into the classroom. One of their teachers stated that what they were doing was, "...making their students into professional chefs." (ibid, 2004:191). From this, we can further identify that vocational learning is concerned with how knowledge and skills are somehow transferred from occupational to learning sites. Arguably, one of the ways in which teachers can facilitate this is, if it is contextualised, is through their CPD. If approached in the right ways, CPD is an activity that has the potential to enable teachers to link between the occupation and the classroom. Without activities that enable them to do this, then by extension, CPD and also teaching and student learning, would be impoverished.

Organisational and structural impacts on teachers' professional learning

The discussion thus far has concentrated mainly on teachers as individuals, although it has raised the importance of collaborative learning and begun to situate it within their wider occupational network. It has not however, situated them within the context of their employing organisation. In my earlier work (Broad, 2011), I identified structural barriers to engagement with CPD. For some teachers, the ways in which their work role was organised could be a barrier. One significant example was teachers who did not possess a strong subject or occupational identity, such as mathematics teachers who deliver Functional or Key Skills. They found themselves isolated in terms of collaborative professional development opportunities. Rather than being situated with other maths teachers, they were placed within vocational areas. Due to this, they found collaborative learning opportunities difficult to access.

The main barriers to engagement with CPD that I found in my previous research were because of limited time and funding. Similarly, but in relation to occupational development, rather than general CPD, Lloyd and Payne (2012) found time was a barrier in their study of hairdressing. For their teachers, this was compounded by issues of work intensification. This lack of time is further compounded by the nature of CPD itself. Misra (2011), explains that CPD activities by nature, are very time intensive but by drawing on European reports, argues that it is necessary for vocational teachers to be given time away from teaching to enable them to keep abreast of occupational and industry changes. The former government agency in the UK, responsible for

overseeing FE workforce development, also identified time as a barrier, alongside a lack of organisational support in general (LLUK 2008).[1]

Similarly to Fuller and Unwin (2003), in their identification of expansive and restrictive learning environments, other writers highlight the essential role of managers in enabling or disabling workplace learning. Page (2011), distancing his debate away from dichotomous power and resistance approaches whereby managers hold power and workers resist, highlights that resistance for FE is micropolitical and that FE managers engage in both covert and overt acts of resistance. Arguably, it is through these resistive practices that teachers may find opportunities to engage with meaningful professional learning. Most important within Page's study is that one of the purposes of covert or 'decaf' forms of resistance is that it serves the purpose of offering, perhaps only illusory, a sense of freedom. What this may mean is that even if managers have no real power to open up spaces for teachers' CPD, they may be able to offer up to teachers an illusion of space, thus in some small way empowering teachers. Shain and Gleeson (1999), offer a more transformative view of the power of middle managers. Whilst they do not specifically focus on CPD, they argue that middle managers can and do play the role of ideological buffer between senior managers and teachers that enable them to filter the worst excesses of the market reforms for FE. They identify three approaches taken by middle managers to the directives from senior managers. Middle managers may position themselves as 'willing compliers' who exhibit a deep commitment to the FE institution and its corporate image or as 'unwilling compliers' who, they argue, are disenchanted with the managerial ethos and thus feel angry and frustrated. In both these approaches the stance taken by the manager may not open up spaces for teachers to engage with their own identified CPD. The third

[1] Lifelong Learning UK (LLUK) was the Sector Skills Council for the Lifelong Learning Sector from 1st January 2005, to 31st March 2011 when it was abolished.

approach identified by Shain and Gleeson is that of 'strategic compliance' and it is this line management approach that may offer the greatest opportunity for opening up space for CPD for teachers. The attributes of a strategic complier is that, "...of artful pragmatism which reconciles professional and managerial interests." (ibid, 1999:474). They argue that these managers use innovative strategies in an attempt to work round issues and problems. What this may mean for teachers as they attempt to engage with CPD is that, as much as they can, within the limits of the organisational system, managers open up space to enable teachers to engage with professional development.

This chapter thus far, has explored some of the ways in which vocational knowledge and learning are understood and the ways in which this has had an impact on conceptualisations of learning and professional development. Through this, I have attempted to raise the importance of context for both vocational teaching and learning, and for the professional development of vocational teachers. This context has examined firstly, the occupational contexts that teachers need to learn from in order to inform their classroom practice, and the organisational context that has the power to enable or disable their CPD activities. I now wish to turn attention to the conceptual framework used to examine the complex phenomena of vocational teachers' professional learning.

Actor-network theory as a conceptual and analytical approach

There are two key reasons why I have chosen to use Actor Network Theory (ANT) to explore how vocational teachers maintain and develop their occupational expertise. The first is the complex and heterogeneous nature of the FE sector as explained in Chapters One and Two. ANT will enable an untangling and, therefore, more detailed examination of this, which in turn will

reveal the patterns of what it is that teachers do. The second is, as I noted earlier, that for teachers to be able to maintain and develop their expertise, necessitates them accessing original occupational sites, where the vocation is practised. ANT facilitates, through allowing one to 'follow the actor', a mapping of the pathways and mechanisms that these teachers use to access new workplace knowledge.

There are very few instances of ANT being used in the field of teachers' professional learning and where it has been applied, it has been in relation to technology. Rizzo (2003), has used the concept in broad terms, alongside that of Engeström's (2001) expansive learning theory, to explore ways of encouraging secondary school teachers to adopt Information Communication Technology (ICT) for pedagogic reasons. Samarawickrema and Stacey (2007), have used ANT to explore the development of technological approaches in relation to teacher development on distance learning programmes, within a Higher Education Institution (HEI).

Similarly, there has been relatively little uptake in the use of ANT within the field of education more generally. Where it has been used, it has been mainly as a vehicle for following the trajectory of policy as it moves through networks and organisations, and impacts on teaching and learning. For example, Hamilton (2010), argues strongly for the use of ANT for policy analysis, and uses it to explore the implementation of a literacy policy initiative. Gholamreza and Wolff (2009), have used the ANT concept of boundary objects to explore the problems of the implementation of policy in the maritime vocational education arena. Mulcahy (2010), has used ANT to examine how educational standards are used, and how they impact within vocational education, and uses the concept of the 'performative' to identify how knowledge is made through action. Similarly, Fenwick (2010a), has used the concept of immutable mobiles, drawn from ANT analysis, to explore policy enactment.

Crossing the boundary from policy to practice, ANT has begun to be used to explore classroom practice, especially in the context of literacy. Burgess (2008), using an ethnographic ANT approach to explore Individual Learning Plans, conceptualises these as an artefact, and tracks the trajectory from policy formation to the classroom. Edwards *et al* (2009), have used the ANT concepts of translation and boundary objects to explore both the literacy curriculum demands, and students' own practices around literacy. Edwards (2009), uses the ANT concept of symmetry to explore the divergent interpretation of a particular curriculum across three educational sites.

The first reason for using ANT here is to enable a nuanced and detailed exploration of the complex phenomenon of teachers' CPD which, by its very nature, presents practical and methodological problems, as it is, "...not possible to know messy objects." (Law and Singleton, 2005:333). This complexity is not just an abstract metaphor but an accurate, technical, realistic characterisation (Saldanha, 2002). Mol and Law (2002), define complexity as when things don't add up and suggest that by recognising and acknowledging complexity, it offers an alternative approach to understanding messiness. ANT then offers ways of understanding and dealing with the unpredictable and fluid materiality of the world which is described by Law (2002), as a multiplicity of heterogeneity. By opening up the heterogeneous, complex and messy nature of the terrain to be studied, approaches that enable the demystifying of teachers' CPD by unravelling what it is that teachers do in practical terms becomes possible.

The second reason is to map teachers' trajectories as they go about maintaining and developing their occupational expertise. ANT was developed in the 1980s as a reframing of social theory, and in part grew out of the discipline of science, technology and society (SIS) (Waltz, 2006). Perhaps most confusingly, the title, 'Actor-Network Theory', does not actually describe what it is and is misleading. First, it is actually not viewed as a theory (Law, 2007). Theories try to explain a phenomenon or event in some way and according to Law (2007:2), ANT,

"...instead tells stories about how relations assemble or don't." According to Callon (1999), this lack of a strong theoretical approach is one of the key criticisms of ANT, but as he argues, this is in fact an actual strength as it then enables a refocusing onto the action, rather than the actor. This is particularly important here as it is the actions that teachers take as they pursue their professional development activities that this study aims to map. Additionally, Callon (1987) explains that an actor-network is neither an actor nor a network. Rather, it is a web of relations whereby all actors and entities are linked to one another. Accordingly, Latour (2010) explains that ANT has very little to do with the study of social networks, or with the study of organisational structures and networks. Indeed, ANT analysis was developed as a reaction to the overly globalised concepts of such things as institutions and organisations. Neither is it a study of what is produced by networks. As explained by Latour (1987:21), studying the fabrication of scientific facts was to not analyse the final products, but to:

> *...follow scientists and engineers at the times and at the places where they plan a nuclear plant, undo a cosmological theory, modify the structure of a hormone for contraception, or disaggregate figures used in a new model of the economy.*

I maintain that both methodologically and conceptually, following teachers in their occupational development is the same as Latour following scientists and engineers. What is important here is not just what teachers or scientists as actants develop, whether it is a nuclear plant or the development of occupational knowledge. The importance is in the ways in which they do this and for teachers, learn about their original occupation.

What ANT offers then, is a new and different approach to analysing how teachers go about maintaining and developing their occupational expertise by enabling the complexity of interrelations to be observed. It is the relational

qualities of ANT that are important, as ANT's distinctive offering is, "...in overcoming the descriptive resistance to dealing even-handedly with persons, things, artefacts and so forth together." (Strathern, 1999:156). This relationality enables an approach of radical symmetry that treats all actors, whether human or non-human, as equal (Fenwick and Edwards, 2010). It is this very symmetry and relationality that enables a move away from some of the dualisms such as human/non-human, meaning and materiality, big and small, macro and micro, social and technical, nature and culture (Law, 2007). It moves away from a dualistic approach by decentring the object. In other words, the teachers do not reside at the centre of the actor-network, analysed through an either/or approach, thus all actors and entities, all the things that exert power are followed. Therefore, actor webs always consist of both human and nonhumans (Saldanha, 2002). What is unique within ANT is this very approach and other analytical approaches ignore the role of non-human things as they are viewed as being different to human things (Waltz, 2006). Waltz argues that when non-human things are taken into account, they are usually seen as either tools serving human aims, or as over-determined agents of change. What they are not accorded is any form of social agency. What this conceptual positioning enables, is to take account of all entities in a relational way, within the teachers' CPD network. These, if staying in accordance with ANT conventions, may include such things as the context and site of both where the CPD activities take place and then where the newly developed skills and knowledge developed are enacted. It may also include occupationally specific tools, such as wood saws for carpenters and scissors for hairdressers, that are used, or learnt about, and the people that teachers come into contact with to learn from. This in turn will open up new actor-networks, those that these new individuals or tools reside within. This pattern of enactment and network relations begins to again highlight the complexity of the territory of teachers' CPD and thus the imperative of an ANT approach.

Even though the above begins to evidence the possibilities of ANT, it has been criticised for having a number of limitations. Central to these are the epistemological and ontological approaches (Cordella and Shaikh, 2006). This stems from the position that, "There is no such thing as a purely social actor or purely social relation" Whittle and Spicer (2008:612). What ANT therefore does is bring together social constructivism and realism (Saldanha, 2002; Miettinen, 1999). Cordella and Shaikh (2006), however, argue that ANT cannot be seen as constructivist as within ANT, reality emerges not from the interpretations of the researcher, constructing theory, but from the interplay between different actors, both human and non-human. This leads to the second limitation that lies within the concept of symmetry in that ANT fails to conceptualise adequately the distinction between non-humans and humans (Walsham 1997). This has lead to accusations from both Miettinen (1999) and Bourdieu (2004) of Machiavellianism, whereby the actor, the prince, the spokesperson, tends to be human, rather than non-human, leading to extreme asymmetry. This may be because within the complex phenomena that ANT attempts to study and analyse, it is difficult to map all the actors or to structure the relationships between all of these. The temptation is to favour the human actors over the non-human.

A further limitation linked to conceptualisations of actors, is that of agency. Whittle and Spicer (2008) explain that, despite ANT being positioned within anti-essentialism, it relies on notions of inherent agential capacities on the part of the natural and material, non-human objects. This raises issues as to whether both human and non-human actors are endowed with agency or whether it is emergent from action within networks (Cordella and Shaikh, 2006).

This section has offered examples of how ANT has been used both within education and more widely, and has presented a case as to why this is an apt and necessary way of exploring vocational teachers' CPD activities. It has also

explored some pertinent critiques of ANT to be borne in mind when deploying ANT. In the next section, I present and explain the particular ANT approaches and tools that I employ in the study. These enable detailed analysis of five distinct aspects of professional development. The first is the multiple worlds of teachers' CPD that each conceptualise and shape professional learning in different ways. Second are the ways in which, through processes of translation, the conceptualisations and forms of CPD are shaped. The third is the ways in which teachers circulate within their own CPD networks and the extent to which, and types of power, they can exert over this. The fourth that I present are ways of understanding, through the concept of space/ time, how teachers access alternate worlds. This is further developed and from this, the fifth aspect emerges. These are the tools that enable analysis of the mechanisms teachers use to access knowledge and skills from their original occupation to then bring back to the teaching and learning site.

Identifying the multiple worlds of teachers' CPD

One of the distinctive approaches offered by ANT is the concept of multiplicity which enables a radically different analytical approach. As Fenwick and Edwards (2010) explain, the usual view of social constructivists is that there is one world, and that different perceptions are brought to bear on this. ANT enables a reshaping of ontology and highlights that the reality we live with is one *performed* by a variety of practices and makes clear that there is no single, natural, or material reality. For Law (2007), the debate is about what is real, what is out there, and how reality is achieved. The assumption behind ANT is that with performance being defined as, "Material processes, practices, which take place day by day and minute by minute." (Law and Singleton, 2005:775), reality is formed through action in the here and now and has no form outside of this performance. Consequently, as reality is performed in different ways by

different actors within alternate Actor-Networks, this reality is multiplicitous. The distinction that, "...reality does not precede the mundane practices in which we interact with it, but is rather shaped within these practices." (Mol, 1999:75), is important here as it then becomes the context within which action is found, and the action itself, that shapes reality. ANT approaches therefore explain complexity and contradiction through there being multiple realities and worlds, and that alternate Actor-Networks inhabit these.

This ontological position of there being different realities has been applied in practical and research situations. Law and Singleton (2005), in their attempt to map the trajectories of patients with liver disease, found that it was difficult to identify a common trajectory of treatment. In line with ANT notions of multiple worlds, they argue that their difficulty was because of 'messy objects' caused by different perspectives of these objects. Their particular object was the treatment of liver disease and they found that it had different significance for patients, specialists, general practitioners and relatives, "It simply means different things to these different groups." (ibid, 2005:333).

In previous explorations of teachers' CPD and through using the concept of multiplicity, I identified three distinct worlds that shaped CPD that are: a) policy CPD world; b) organisational CPD world; and c) teacher CPD world (Broad, 2011). In the study here, the concept of multiplicity will be used to explore in detail the teachers' CPD network for occupational development and will make visible the other worlds that theses teachers engage with in pursuit of this. This is important as, because of the nature of the different occupational areas and sites where individual teachers teach, their CPD will each take different trajectories. These worlds that I wish to map here are not, however, entirely disconnected. They are not hermetically sealed, they do overlap and there is slippage between them. The importance of this here is that it seems likely that there are numerous worlds, similar to the worlds within worlds as indentified by Unwin *et al* (2005). These worlds have the potential to impact on how

teachers maintain and develop occupational expertise, and the interrelations between these may be helpful or hindering to teachers as they engage with CPD. Of particular interest here, are the occupational worlds that teachers may engage with and connect to, in order to keep their knowledge and skills current. These will offer teachers opportunities to connect with the latest trends and thinking for their specialist area, and may enable teachers to link to experts and other interested and interesting colleagues.

Using the process of translation for tracing the multiple worlds of teachers' CPD

One of the ways of tracing the influences of these alternate worlds is through the process of translation. This is a central proposition within ANT which is often referred to as, "...the sociology of translation." (Callon, 1986a:1; and see also, Fox, 2000; Law 1992). Translation, according to Law (2007), enables one to see that networks and interrelations are always insecure, and that they are susceptible to failure. It is through continuous negotiation/ re-negotiation that a network stabilises. This means that the process of translation is seen as an open process where almost anything could happen. These features of ANT opens up the possibilities for the analysis of teachers' CPD as, due to the complexity of the FE sector discussed earlier, each individual teacher may develop both unique and numerous connections. However, this does not mean that the actors within an ANT network are seen as being atomistic. Fenwick and Edwards (2010), describe translation as what happens when entities, both human and non-human, network together to form links and chains of actions. This is a significant interpretation as even though within ANT, connections forged through the process of translation are seen as unstable, necessitating continuous negation and re-negotiation, for Fenwick and Edwards (2010), the end result of the process of translation is that of a chain or network of actions

and things that have become stable and durable. It is this very tension between stability and instability, along with the ways in which networks become stable, that is useful here for examining the networks that teachers may, or may not, develop in order to maintain occupational expertise. As I explore later, it will necessitate teachers building and developing links outside of their employing college and it is important to be able to judge both the ease in which teachers can do this and the effectiveness of these links.

Perhaps the earliest and most well-known early ANT-based studies that developed and used the concept of translation, is that of the scallop fishermen of St Brieuc Bay (Callon, 1986a). Callon followed three researchers through the construction and deconstruction of nature and society. These researchers followed the fishermen of St. Brieuc Bay as they worked on sustaining the scallop beds on which the fishermen and local community relied. This process of translation, developed by Callon to hold to the conventions of symmetry, consists of four moments of: 1) problematisation; 2) interessement; 3) enrolment; and 4) mobilisation. He classifies these as moments as they are not separate phases but, he argues, in reality overlap.

The moment of **problematisation** works to identify the issues that require a solution (Boelens, 2010). It enables actors who hold alternate views to be aligned in the same direction. The process of problematisation, "...directs the heterogeneous actors to support a specific network definition and to work in the same direction." (Christiansen and Varnes, 2007:286). In Callon's study, the issues identified through the problematisation moment were that the scallop stock at Brest had dwindled due to the effects of starfish combined with a lowering of water temperature. This was compounded by the fishermen who were making substantial profits from overfishing the remaining stock. Problematisation is hypothetical and propositional. It is done through framing and selection and exclusion, by deciding what is included in the network and what is not. It is concerned with, "...displacements of goals and interests, and

also, displacements of devices..." (Callon, 1986a:18). In other words, defining not only what is allowed inside the actor network, but what is kept out.

The next moment of translation, as mapped by Callon, is **interessement**. The problematisation stage presents hypothetical ideas and in the case of the scallop researchers, was in reports and articles presented and have not as yet been tested in practice (Callon, 1986a). Interessement is where the propositional and hypothetical ideas that provide a solution to the identified problem are imposed and stabilised. The task here is to ensure that the actors within the emerging network are made interested in both the problem and the solution and that they become linked into the emerging network.

The third moment of the translation process is **enrolment** and here certainty is strived for. Callon explains that, no matter how strong and convincing the arguments made in the problematisation and interessement stage, "...success is never assured." (ibid, 1986a:16). For Callon, it may be that the St Brieuc Bay scallop does not behave in the same way as those witnessed by the researchers on their fact-finding mission to Japan. The reason for this instability is that the moment of enrolment, whereby actors are brought into a unified network of associations and that of interessement, where solutions are locked into place, are two sides of a coin (Nespor, 1994) and there could easily be slippage of the emergent and developing alliances. For the actors to be enrolled, they must be willing (or be coerced) to do so. It is here that alliances are fashioned within the network (Edwards, 2002). However, as Hamilton states (2010), the successful process of enrolment takes investment of resources, strong alliances between actors and the skills of policy implementers to make systematic changes feasible. Thus, success is never assured.

The final moment of early ANT translation is **mobilisation** where the few become the spokesperson of many. In Callon's analyses of the St. Brieuc Bay scallops fishermen, the few who made up the spokespeople represented both

the scallop fishermen and the researchers. They came together in a small room over tables and charts and committed the wider populations of scallops and fishermen to a particular action. They are mobilised. These spokespersons speak for the group's existence. They are constantly working to justify the group's existence. They invoke rules and precedents (Latour, 2007). A range of tools are drawn from this process of translation in order to examine and explore teachers' occupationally focused professional development and are explained below.

Exploring within network worlds

Latour (2007), makes a distinction between those actors within a network that act as intermediaries and those as mediators. Both of these are things that circulate through a network and perform particular functions. An intermediary transports force or meaning without changing it. Latour gives examples of paint brushes in a classroom, the sign directing visitors to reception, and the university calendar of dates. These are things that just sit there. They may be used in some way, or direct people in various directions. In a way, they can be handled as if they have been 'black boxed'. Black-boxed is used to describe either a network, or an entity within a network, that has become taken for granted, or has become immutable (Edwards, 2009). Whittle and Spicer (2008), give an example of the process of black boxing as when a prototype is turned into an off-the-shelf product. In terms of teachers' CPD, the legislative requirement can be identified as an intermediary that has been black-boxed. I showed in my earlier study (Broad, 2011), that the legislation for CPD carried meaning through the teachers' CPD network, acting as an intermediary, but it did not work as a mediator to change teachers' practice around CPD in significant ways. In other words, for the purposes of the analysis in this study, the legislation can be 'black boxed'.

A mediator also circulates through the network but can transform, distort and modify meaning. Latour (2007) notes, there are endless numbers of mediators in any network and that each can become complex, leading in multiple directions. Of interest is as Latour explains, their input is never a good predictor of their output. In other words, how a mediator behaves within a network cannot be predicted. Actors within a network can also change and consequently, an intermediary becomes, through the force of other actors, a mediator and in turn alters or exerts force on other actors within the network. For example, if the intermediary of a paint brush is used to paint graffiti, it becomes a mediator. This offers a useful analytical tool for CPD and enables the intermediaries and mediators to be identified, alongside the ways in which they work to change practice. However, as Latour (2007) argues, without careful analysis, whether entities within an actor-network are behaving as intermediaries or mediators is not certain and thus necessitates, within ANT, that the analysis follows the actor to find out where it leads and what it does.

Emerging here is that mediators within networks appear to act with agency and have power. Usual approaches to understanding agency are through the dichotomy of determinism/ free-will. Hard determinists would argue that all human action is a causal effect of a set of factors outside the agent's control (Foot, 1957). At the other end of the continuum, sits proponents of free will with Sartre (1958), arguing that to deny the essential human reality of free will is 'bad faith'. The ANT approach takes the analysis away from these time-worn understandings by, according to Munro (2009), moving conceptions of agency away from human consciousness. However, this does not mean that ANT approaches are deterministic. I am not saying here that teachers do not have free-will in deciding their CPD activities. It more as described by Waltz (2006:10), who states that the process of translation is not deterministic and that this is due to the unpredictability of network connections in that, "...entities negotiate the connections when they come together."

What ANT instead does, is offer two clear alternate approaches to understanding agency, through the process of symmetry and of network connections. A key proposition of ANT is that of symmetry, that there is no *a priori* supposition that non-human things are any different to human (Edwards, 2009; Waltz, 2006). However, this analytical approach must be handled with care as Waltz (2006) explains, it is not that non-humans are given a status equivalent to humans, it is that ANT does not attribute status, category or significance to a particular actor or thing. Rather, it investigates the interactions between things, whether they are non-human, human, ideas or concepts. This is important as if all actors and actants are treated equally, it allows an exploration of the agency of all of these actors and actants within a network.

By moving concepts of agency away from humans and by endowing all entities within an actor-network as having agency, what becomes clear is that agency is distributed and goes beyond the individual (Berndt and Boeckler, 2009). Therefore, power to act is situated within the assemblage, rather than with individual actors and actants and is a manifestation of the associations being made and unmade within the network. Therefore, the quality of teachers' CPD will be determined by the network connections that they are able to link with and to. Munro (2009) suggests that, in order to understand ANT approaches to agency is to focus on effects rather than intentions, will or consciousness. Analytically, this can be used to identify how assemblages or nodes within the teachers' CPD network come together to perform. If power is conceptualised as action forced by a range of entities, then these assemblages or nodes should be able to be identified. They will circulate and leave traces.

Similarly, therefore, the power that teachers have to pursue their own indentified CPD can be seen as relational, situated within networks, and contingent on the enrolment of others (Horowitz, 2011). Power can therefore be seen as being distributed throughout the actor-network as it is seen as an

attribute of the quality of network connections themselves, not as a separate force, capacity or thing commanded by individuals (Jewson, 2007). By following the actor of occupational development, the distribution of the power forcing its emergent action can be traced.

Moving between and beyond alternate actor-networks and worlds

In order to shed light on how teachers maintain and develop their occupational expertise, it is necessary to explore the ways in which they can access these different networks of the original occupation. However, before exploring the interplay and connections between the teacher and their specialist occupational areas, it is helpful to rehearse some key fundamental approaches within ANT. An actor-network is composed of animate and inanimate heterogeneous elements. It is neither reducible to an actor alone nor to a network, but is simultaneously an actor, networking various elements and a network capable of redefinition and translation (Callon, 1987). Thus, neither actors nor networks are predictable or stable. The entities within the network, and the network, constantly perform, bringing new entities in, excluding others, redefining what they are and forging new links and nodes to other networks. Therefore, actor-networks are fluid and the chains of links they make, as they perform, will be diffuse and open to change. This presents a challenge for tracing the links and connections between the multiple worlds of teachers CPD as they cross from learning sites to occupational sites.

This fluidity can be identified within vocational teachers' original occupations. These occupations and industries change and develop. With new approaches and techniques being constantly introduced, they do not stand still. An example of this can be seen in hairdressing. It follows fashion and trends. Is hair straight or curly this season? What is the latest colouring technique, is it

one, two or three tone? What is the best way to achieve this 'look'? This new and developing knowledge is not going to be crafted within FE colleges, but at the cutting edge of fashion, within the original industry sites. The questions this raises, is how teachers access this new knowledge and how can occupational and learning sites be connected to one another? What this requires is that these particular vocational teachers need to inhabit both worlds. This necessity was also identified by Barnacle and Mewburn (2010), in their study of doctoral students, who they found occupied multiple and overlapping worlds, and by Law and Urry (2004), who explain that the ANT approach of performance leads to the idea of multiplicity and that realities overlap and interact with one another. This makes sense for teachers as the engage with CPD, as their engagement will be multiplicitous. The task then, is to use ANT to establish the ways in which associations take place, not only within institutions, but how they, through a process of translation, network across a whole variety of institutions and networks. For Munro's (2009) doctoral students, these multiple worlds of other institutions and networks include science, government, the factory and markets. For vocational teachers these other worlds may include the original industry or occupation, the employing college and teachers of the same occupation working in other FE colleges.

Perhaps one of the most useful studies for understanding how vocational teachers can access multiple networks is that by Nespor (1994), who studied physicists and managers in the making through undergraduate programmes. The central question to his study was how activity in one setting, such as a classroom, related to activity in settings distance in space and time, such as other classrooms and workplaces? The main difference between Nespor's study and the one here is what is being transported across space and time. For Nespor, it was traditional knowledge disciplines. For vocational teachers, it is occupational expertise. However, the important factor is the ways in which this study enables a reconceptualisation of practical and applied learning within a

space/ time continuum, which conceptually discards the false notion of artificial organisational boundaries and allows for greater exploration of the ways in which teachers learn. What is required, and what a space/ time approach offers, is to further develop the analysis of how these multiple worlds connect, so as to indentify the mechanisms that enable teachers to access occupational expertise.

The analysis now needs to move to exploring in more detail, the mechanisms that teachers can potentially mobilise in order to bridge into the alternate occupational and industry worlds. Earlier, in the explorations of Callon's moments of translation, I identified that spokespersons are influential within the moment of mobilisation, by effecting action within the actor-network. These speak for the few to the many, and thus have links to the alternate worlds. Within ANT approaches, there are three other additional ways in which connections can be made. These are through boundary objects, obligatory passage points (OPPs) and transcription devices. It is to these conceptual tools that I now turn.

Conceptual tools for identifying links and paths between alternate actor-network sites and worlds

One of the most influential approaches for exploring how multiple worlds intersect and relate, is through the 'after-ANT' concept of boundary objects. The concept is used widely within ANT and consequently it carries slightly different meanings. For Latour (1996), boundary objects work to link the local to the global, in other words, compress time and space. For Gholamreza and Wolff (2009), boundary objects refer to entities that act as an interface between different social worlds and cross different community boundaries. Star and Griesemer (1989) explain that they are both plastic enough to adapt

according to need, but robust enough to maintain a commonly held identity across social worlds or alternative networks.

For theorists working within ANT, they also take different forms. For Star and Griesemer (1989), boundary objects are produced when actors from multiple worlds collaborate to produce artefacts. In Star and Griesemer's case, these artefacts are representations of nature within a natural history museum. For Christiansen and Varnes (2007), boundary objects can be either material objects such as templates used for transferring data between organisational units, or immaterial objects such as a shared vision. Bowker and Star (2000:289), conceptualise boundary objects more widely in that for them, they are the same as any other entity within a network, and can be, "...stuff and things, tools, artefacts and techniques, and ideas, stories and memories."

Where boundary objects reside also differs between ANT theorists. In Gholamreza and Wolff's (2009) usage, they are entities interfacing between different social worlds which suggest that for them, they reside on the edge of the actor-network. The concept of boundary objects has been used within communities of practice in similar ways (see for example Wenger, 1999). However, Edwards *et al* (2009), warn of Wenger's over-simplistic use within communities of practice in that within this concept, boundary objects are seen as bridges that sit on the edge of communities. Within an ANT approach, they argue, boundary objects can reside at any point within a network. Bowker and Star (2000), see boundary objects as sitting more centrally and also inhabiting several actor-networks at the same time, whilst being able to satisfy the informational requirements of each.

This flexibility over how boundary objects can be conceptualised and understood is useful here. Those entities, actors and artefacts, which link the alternate worlds that make up teachers' CPD for occupational purposes, can be explored usefully using this flexible concept. What is equally important

analytically, are the ways in which they are understood to be enacted. The creation and management of boundaries objects requires both collaborative work and communication between the two worlds (Star, 1990). This means that within all the worlds that have potential to support teachers in maintaining and developing their expertise, there needs to be a commitment to it and the will to commit resources.

The second analytical tool that can be employed in examining how different worlds interconnect is that of 'early-ANT' theory of obligatory passage points (OPPs) from which Star and Griesemer (1989), developed their concept of boundary objects. OPPs differ from boundary objects in two significant ways. First, boundary objects are normally described as an individual actor or type of entity such as a mandatory document (Christiansen and Varnes, 2007), whereas an OPP is an assemblage of things. For example Law (1986), identified the river tributaries of Lisbon as an OPP that enabled a small number of people to influence events half-way round the world. Second, a boundary object is an entity that connects worlds, whereas an OPP acts as a funnel that all things must pass through to bridge alternate worlds.

Callon (1986b), explains that the success of the translation process can never be taken for granted and he sees OPPs as a key component for a successful translation process. OPPs work by responding to identified problems by enabling a particular, specific and chosen solution to be positioned as the only way forward, as the one answer, thus, certain actors and entities become indispensible. An example of this can be found in Callon's (1987), study of the development of an electric motor vehicle. This new vehicle is presented as the solution to pollution and traffic problems, but is plagued by short battery life issues that need to be resolved. The French electric company, EDF, as the developer of these batteries, positions itself as the solution and becomes indispensible. They situate themselves as the only company with the facilities and expertise, situated within their laboratories, to enable these batteries to be

developed. The assemblage of the EDF has become an OPP, it has become, "...a passage way through which all things must pass." (ibid, 1987:26). The network effect of this is that they have power and for Callon it is within the way that the EDF laboratory has positioned itself that invests it with the power as an OPP.

Easily identified here is that OPPs, unlike boundary objects, are not individual actors within the network but are made up of an assemblage of actors. Similarly for Nespor (1994), exploring how knowledge travels across space and time from workplaces to the classroom, the OPPs that enabled this to happen were identified as the physics and management courses under study. This can be used in two distinctive ways. Firstly, one can examine whether the colleges who employ teachers are positioned as OPPs for teachers' CPD for occupational development, meaning teachers have to pass through and use the college in order to access CPD. If so, then the analysis turns to the ways in which colleges are positioned. In all likelihood, this will be concerned with enabling teachers to access appropriate support and resources. Secondly, as I am arguing here, to maintain and develop their occupational expertise necessitates teachers finding pathways that link to the original occupation. They need somehow to access the knowledge and skills that resides not within their employing organisation, but the world from which they have come. The question then becomes whether there are any OPPs that enable teachers to access this, and if there are, what forms these entities take.

The third and final analytical tool for identifying potential ways in which teachers are able to access alternate occupational sites or worlds is that of inscription devices. These are a distinct form of entity within ANT, conceptualised as artefacts that carry meaning. The concept of inscription devices was developed by Latour (1987:68), whose initial definition was, "...a visual display of any sort of scientific text..." It is a semiotic representation of laboratory work, the effort and resources mobilised to make scientific facts and serves as a junction between two worlds by presenting to one a visual

representation of the other. In an example given by Latour (1987), a particular laboratory instrument, a physiograph, produces a raw image, a representation of some scientific findings. This raw image has been, in ANT terminology, enacted into being within the laboratory. It then becomes a figure within a scientific journal and through this journey it has become an inscription device, a shorthand diagrammatic account of laboratory work, which can connect to other worlds and spaces. It has become a looking glass, enabling the reader of a scientific journal to see into the laboratory.

From this early ANT usage, the concept of inscription devices, through its use in a variety of contexts has widened. For Munro (2009), it can take other forms and begins with the invention of writing. From this invention, a sealed letter of instructions can be sent far and wide, thus mobilising at a distance. The distinctive feature of inscription devices however, is that they are miniaturised and mobile representations of one world within another alternate world. Mützel (2009), believes they serve a specific purpose in that through them, actor-networks can become durable. This occurs through the way in which practice is transformed into material entities. In other words, the ethereal here and now is turned into a permanent artefact that records it *ad infinitum*. More recently, Ceulemans *et al* (2012), have classified teacher professional standards as transcription devices. Within this work they have again widened their reach and view them as, "...all types of transformations through which an entity becomes materialised into a sign, an archive, a document, a piece of paper, a trace." (ibid, 2012:39)

However, Frankham (2006), arrives at the heart of the matter when he explains the mobile nature of inscription devices means that they can travel over distance. This is the important attribute for teachers' CPD for occupational development. Inscription devices may be useful for understanding how teachers cross boundaries into the occupational and industrial worlds in order to gather new skills and knowledge. They may act as a form of boundary object

or OPP that enables these teachers to access new knowledge. What transcription devices there are that link teachers to their industries is not, however, clear and it is the work of this study to uncover this.

Summary

This chapter has explored current conceptions of both the nature of knowledge and teachers' professional learning. Through this I have highlighted some limitations in current approaches to understanding teachers' professional development. I propose a move away from seeing vocational knowledge and teacher professional learning as codified and decontextualised, and able to be transmitted via simplistic means. I have also begun to raise some concerns regarding barriers that teachers may face in their attempts to maintain and develop their occupational expertise and ways in these barriers may be negated. In the second section of this chapter, I developed an alternative way of conceptualising and analysing vocational teachers' professional learning through using ANT to explore the multiple and complex worlds of teachers' CPD. In addition, I have argued that ANT can also offer ways of tracing how teachers transverse these worlds to capture occupational knowledge and skills. The following chapter describes the methodological approaches used for data collection.

Chapter Four: Research design and methodology

Introduction

This chapter explains the ontological and epistemological positioning of this study, the research tools used, and how these were designed, developed and implemented. The key concern, given that so little is known, is to uncover how these teachers go about developing and maintaining their occupational expertise and the ways in which they then try and bring this into the learning sites, their classrooms. From this, it is important to establish whether this is actually meaningful. By this I mean, does it actually matter whether vocational teachers keep up-to-date? Therefore, I wanted to find out, from the teachers themselves, whether CPD actually made a difference to their practice and had an impact on their pedagogic practices. Finally, as these CPD activities are so well hidden, I wanted to identify the ways in which other worlds impact on teachers as they maintain and develop their occupational expertise. The purpose of this study therefore, is to explore these activities from the perspectives of teachers and to identify what they consider to be of value in aiding them in maintaining and developing their occupational expertise. The aim of the research is to:

- Identify the ways in which vocational teachers in FE maintain and develop their occupational expertise and knowledge.

To fully explore the ways in which teachers operate within the complexity of FE, and to capture the 'lived experiences' of teachers, I formulated the following research questions:

a. To what extent is the maintenance and development of occupational expertise important to vocational teachers and if so, why?

b. To what extent do vocational teachers believe that the continued development of their occupational expertise impacts positively on their pedagogical practice?
c. What activities do vocational teachers engage with to develop occupational expertise?
d. What organisations, bodies, companies, individuals or other institutions do vocational teachers engage with whilst carrying out these activities?
e. Where are the learning sites at which these activities take place?
f. To what extent do the vocational teachers' employers (the colleges) support their CPD activities?
g. To what extent are activities for vocational teachers heterogeneously different to those of other teachers?

In order to enable me to meet the research aims, this study adopted a mixed methods (Robson, 2002) and reflexive approach, congruent with ANT (Whittle and Spicer, 2008) of eliciting both quantitative and qualitative data. This enabled an emergent understanding of the key issues for teachers' professional learning for subject and occupational development purposes, prior to exploring this in more and deeper detail through qualitative approaches.

Research approach

As little is known about how teachers maintain and develop their occupational expertise, this study will build theory, rather than test hypothesis of already established theory. Drawing from ANT, what is important here is to enable the research to follow the actors, the respondents, as they go about developing their occupational expertise. As explained by Freeman (2009:440), the epistemological position of ANT is rooted in pragmatics, not logic, and that it,

"...takes place on the ground, as practitioners (including researchers and policy makers) talk and write about new ways of doing things." Therefore, in collecting and analysing the data, I needed to, "...learn from the actors without imposing any *a priori* distinctions upon them." (Callon and Latour, 1981:1). A similar, and therefore, useful research approach, is grounded theory whereby epistemology and ontology are, "...joined at the hip." (Bryant and Charmaz, 2007; Clarke, 2005). Within both these approaches, research methodology and analysis develop concurrently, with the interrelated aspects each informing the other. In line with ANT, the values underpinning grounded theory are that the area of research is approached with as few preconceptions as is possible. Glaser (1992), states that the tactics of grounded theory will encourage the researcher to take a 'blank slate' approach, in order that research material developed can be analysed in, as much as is practicable, a value free environment. Similarly, Law (1992:380) explains that, if we want to understand, then it is important not to start assuming whatever we wish to explain and, "...instead we should start with a clean slate."

Drawing on the stated approaches of both ANT and grounded theory, and following Glaser and Strauss, (1967), the research methodology used in this study involved three stages of data collection. The purpose of the first stage was to begin to develop an understanding of how teachers in the sector, in general, went about maintaining and developing subject and occupational expertise. The second stage began to focus more specifically on vocational teachers. It was concerned with refining and deepening the understanding of teachers' CPD for occupational purposes. It was here that I attempted to trace the trajectories and map networks of teacher's engagement with activities. The third and final stage saw me 'following the actor' of occupational development and here I had the potential to cross sites and boundaries, so as to follow the teachers wherever their development activities led.

The approach taken in this study is congruent with my ontological position as a researcher in that there is no objective 'truth' to be discovered through research. Social reality is both multiple and complex. It is not objective in nature, or viewed as 'out there' in the real world (Cohen *et al*, 2000). In terms of validity, therefore, there is little attempt made to capture generalisable data. The sample is not representative of teachers in the wider sector. It does not seek to generate normative data (Delamont and Hamilton, 1984), that can then be generalised out to the wider population. This doesn't mean, however, that the findings here will be of no interest to those concerned with how vocational teachers maintain and develop their occupational expertise, or the CPD needs of FE teachers more generally. I suggest in the final chapter, that this research makes a valuable contribution to the literature, as it offers a new conceptualisation of how vocational teachers seek to maintain and develop their occupational expertise.

Ethical considerations

This study followed the Social Research Association (SRA) guidelines (2003), and the British Education Research Association (BERA) guidelines (2011). Due to the nature of the study and the possible impact of insider research (Mercer, 2007), as I was at times researching into past students, some of whom I may have taught, special consideration was given to the BERA guidelines on 'Responsibilities to Participants'. All the potential and actual participants are responsible, mature adults, and following Diener and Crandall's (1978) definition of informed consent, were made fully aware of the aims of the research and that they were free to choose whether to take part. They were also informed that they were free to withdraw from the research at any point.

At the questionnaire stage, all potential respondents could opt out of the electronic questionnaire by clicking a link that would remove their contact details from the questionnaire database. At interview stage, only those who agreed to take part in the follow-up interviews, by giving their contact details in the questionnaire, were included. They were given further information about the study and were asked to sign a consent form. All interviewees were offered an electronic copy of the thesis so that they could comment and have any reference to themselves, if they so wished, removed prior to any aspect of the study being made available for publication.

At the third stage, all those teachers who were being observed were made aware of the research through the distribution of information sheets. A potentially more important issue was that as I was observing student competitions, they were, on the periphery, potential research subjects. In protecting these students, I chose not to pay any attention to them as research subjects and they do not form any part of the study here.

Stage One: Questionnaire design and implementation

Distribution of the questionnaire

The key reason for using a questionnaire was that as so little was known about FE teachers' perceptions of CPD, I needed to begin by scoping more widely before narrowing the focus onto vocational teachers' development of occupational skills and knowledge. I also wanted to collect information from a reasonably wide range of respondents. In addition, the initial questionnaire would enable me to both indentify themes for further exploration and to identify suitable respondent for follow-up in the interviews.

In October 2011, an e-mail (Appendix One) was sent to 171 e-mail addresses which contained a link to the electronic questionnaire (Appendix Two). The sample was chosen by purposive means and consisted of past students from initial teacher education courses from two universities in London, who draw their students from across London and the South East. These former students were working in a range of sites including colleges and other forms of training provider. The e-mail explained the nature of the research and the ethical considerations. Ten e-mails 'bounced,' meaning that they were no longer live, thus, 161 questionnaires were delivered to respondents. By the time the cut off point given to the potential respondents was reached, 43 had completed the questionnaires. An initial reminder was sent via e-mail (Appendix Three) which elicited a further 31 responses and a final reminder elicited a further 14 responses. The final number of questionnaires completed was 88, giving a reasonably high response rate of 51 percent. Bryman (2008), drawing on the work of Mangione, states that a response rate over 60 percent is acceptable, whilst to be excellent should be above 85 percent. However, given that these were sent to relatively old e-mail addresses, the response rate generated here is within the boundaries of what would be expected. Further, some of these would have gone to duplicate addresses, and some would have gone to those no longer teaching in colleges. Therefore, even though the response rate was not quite 60 percent, it was satisfactory given the nature of the contact details.

Design of the questionnaire

One of the main considerations for the use of questionnaires is cost and time, and Denscombe (2007) explains that they are cost effective in producing large amounts of data. However, this is not the only consideration and similarly to interviews, questionnaires can generate both quantitative and qualitative data. The data generated from the questionnaire here was mainly quantitative,

although some qualitative data was also generated to explore 'under the surface' of closed responses.

The questionnaire was designed to be distributed electronically using proprietary survey software. Therefore, a key design consideration was to divide the questions into sections of a length that could easily be read on a computer screen (see Appendix Two). The first section of the questionnaire gave brief information about the study. The second section collected demographic data including gender, length of time since qualification, type of employment contract, job title, type of organisation the respondent taught in, and whether they still taught in the sector. The third section was designed thematically, to answer the research questions. Three main themes were addressed: 1) an exploration of the subject and occupational specialism of the respondent, the extent to which they taught this and any other subjects they taught; 2) the development of occupational expertise, activities carried out, and whether the teachers faced any barriers; and 3) professional associations that teachers engaged with for occupational development purposes. The fourth and final section asked respondents to provide a contact e-mail and telephone number if they were willing to take part in follow-up questionnaires, and 40 agreed by giving contact details.

Piloting

The questionnaire was piloted with two experienced teacher educators and four experienced vocational teachers. Four suggestions were given for improvements to the questionnaire: a) to add the category of 'fractional' contract to the possible types of employment contract teachers could be employed on; b) to add 'private provider' to the organisational type that the teacher was employed by; c) to offer a list of options, under barriers to engagement, as I had originally had just an open question here; and d) to

change the wording on membership of a professional association, in light of which, I added a response as to whether the respondent knew of an association but was not a member. Through piloting, it was found that the questionnaire took about ten minutes to complete. This was felt to be appropriate as I did not wish to intrude overly on the time of the respondents.

Using the results from the questionnaire

The data from the questionnaire were analysed using SPSS software and the findings are presented and analysed in Chapter Five. The findings were used to identify suitable respondents for the follow-up interviews and to begin to identify possible professional associations to be followed at Stage Three. The questionnaire was also used to identify four key themes for further exploration:

1. **Occupational updating**. All respondents stated that occupational updating was either very important or important to them, whilst almost 20 percent said it was either not important, or not important at all, to their employer
2. **CPD activities.** The most frequently identified were reading and on-line activities. This is counter to the research explored in Chapter Two, that suggests collaborative learning is the most beneficial, and the findings in my earlier study (Broad, 2011). I also wanted to explore whether teachers felt that their engagement with these activities improved their pedagogic practice
3. **Funding and time**. These emerged as barriers to engagement with CPD for occupational development. I also wanted to explore whether there were any other barriers that these teachers faced and what strategies they had for overcoming these
4. **Engagement with professional associations.** This seemed to be a way that some teachers accessed CPD for occupational development purposes and I wanted to explore this further in two ways: a) what role these associations

played and the form they took; and b) why did some teachers not use professional associations.

Stage Two: Interview design

Interviews were seen as essential for data collection as this study is an exploration of teachers' perceptions of their engagement with CPD for occupational development purposes. This is because, as both Robson (2002) and Bell (2005) explain, an exploration of perceptions requires a level of flexibility that interviews can offer. As Foddy (1993:1) states, interviews enable an exploration of past experiences, beliefs, values and attitudes, in other words, "...subjective variables that cannot be measured directly." Therefore, interviews can elicit perceptions of feelings and views and these cannot be gained by using closed or pre-specified questions.

Purposive sampling was used to select seven respondents for interview. As I explained above, the questionnaire was sent to teachers working in colleges and other institutions. However, the interviews needed to be focussed on teachers in FE colleges and this left me with a potential sample of 24. I was only interested in vocational teachers, teaching students on programmes with strong links to employment. This left a potential sample of thirteen. As there was some overlap of subject areas, random sampling was used to ensure there was only one teacher for each occupational subject area. This left nine teachers and from these, I purposefully chose the final sample of seven. As I had a particular interest in how teachers used professional associations, I chose four that stated they belonged to a professional association in the questionnaire (hairdressing (respondent A), applied sciences, business studies and early years teachers). A construction teacher, who was not a member of a professional association, was also included. I included a graphics teacher as this teacher taught in a specialist art college and I wondered whether this particular context

would give an alternate slant to this teacher's experiences of CPD. The final teacher I included in the sample was a teacher of people with learning difficulties as one of the drivers within this specialist area is that students should be taught vocational skills, such as catering and horticulture. I decided it would be interesting to see how this teacher positioned himself - whether as a specialist in the students' needs or as a vocational teacher and the impact this had on his CPD.

A semi-structured interview schedule (Appendix Four), was developed to capture data on the four themes highlighted above. Interviews took place over a two month period in December 2011 and January 2012. At the start of the interview, an information sheet, explaining the study (Appendix five), was given to the interviewees. The interviewees were also asked to sign a consent form (Appendix Six) to indicate that they understood the nature of the study and the research ethics. All interviews were recorded and fully transcribed, and subsequently analysed using NVivo software, to identify themes and patterns in the data. The key findings are presented and discussed in Chapter Six.

Stage Three: Following the actor of occupational development through observation and participant observation

Stage three of the research methodology was focused on 'following the actor', a research approach first introduced by Latour (Latour, 1987). The final approaches and methods were planned and designed on the ground, rather than set in stone beforehand, as I wanted to remain as reflexive as possible to the emergent data. However, the overriding aim was to explore how teachers used professional associations in order to develop and maintain their occupational expertise. I identified two professional associations for teachers, the Association of Hairdressers and Therapists (AHT) and the Association of Painting Craft Teachers (APCT), and contacted them both in December 2011.

Due to financial and time constraints, I could only follow one of these in the depth I wanted. I used purposive and convenience sampling and chose the AHT as they seemed to be more active and gaining access was easier.

Observations and related activities

Much of the data generation was through observation at events organised by the AHT. Cohen *et al* (2000), highlight a key strength in observation in that it enables data to be collected in 'live' settings. In other words, data is collected on the ground, in real time, as it happens. Robson (2002), explains that observation is a direct way of gathering data in that people are not asked about their views, feelings and attitudes, rather the researcher observes what they do. In my view, observation provides a means to generate further data alongside that from questionnaires and interviews to allow for triangulation. This reduces potential researcher bias and can improve validity (Cohen *et al*, 2000). Nevertheless, a distinct disadvantage of observation is that it is both costly and time-consuming, necessitating the researcher having to travel to distant sites in order to carry out observations in their naturally occurring settings.

There are many ways in which observation can be used as a research tool. Robson (2002) places it on a continuum from structured observation, most normally used to gather quantitative data, to participant observation, a qualitative approach, particularly associated with the Chicago school of sociology and used widely in flexible designs. In planning my role as observer, I drew on Gold (1958), who offers a continuum of research roles and two of interest here are 'participant-as-observer', where the observer is part of the group under study, and 'observer-as-participant', where the researcher has less involvement in the social setting under study. I used the participant-as-observer role at events where I could take an active part, such as student competitions. The second of Gold's categories of observer-as-participant was

used when attending meetings. According to Robson (2002), when using this approach, the observer takes no part in the activity, but the status of the observer is known to the group.

The first observation was carried out was in January 2012 when I attended an AHT executive committee meeting, held over two days in Blackpool. As Robson (2002:314) states, "A key feature of participant observation is that the observer seeks to become some kind of member of the observed group." This initial observation event served this purpose; I was welcomed into the group and my role was explained to the participants. It allowed me to make contacts and to begin to explore what the key focus of my observations should be. This initial event led onto the development of an observation recording tool, described below and to further attendance at an AHT regional student hairdressing competition and the annual AHT weekend seminar/conference. I also observed a student hairdressing competition organised by a large multi-branch wholesaler of hairdressing products.

At the two student competitions attended, I took the role of 'participant-as-observer'. At the AHT competition, I found myself in the role of 'general dogs-body' taking on anything that needed to be done. As I was one of the very few there who did not have responsibility for a group of students, I could take on roles that needed high levels of involvement. I worked most of the morning registering students for the competition. This enabled me to see how teachers worked and operated on the ground when managing groups of students and the interactions between teachers of different colleges. In the afternoon, I worked in the officials' room, adding up judging scores and checking for accuracy of data. This enabled me to capture a different set of participants who were not all teachers, but were drawn from industry. At the second competition, I acted as a judge myself and I found myself closeted with two other judges, one the hairdressing wholesaler and one an experienced

hairdressing teacher from another college. This gave me yet another fertile group to observe and interview.

The final observation event was the AHT seminar/conference. This event took place in a fairly luxurious hotel over three days. Most of the participants arrived on the Friday evening and stayed until the Sunday afternoon. A full calendar of events was provided and there was ample opportunity for socialising and networking in the evenings.

At all these events, the nature of the role I took meant that I could not take field notes in real time. On occasion I was able to jot down the occasional point, but by and large was too busy to be able to do this. I therefore needed a way of being able to develop my field notes at a later date. I combined Spradley's (1980) observation checklist with that of LeCompte and Preissle (1993), to develop a specific recording device (see Appendix Seven). Ideally, I would have liked to have recorded my observations at set points in the day, but the nature of the observation, in that I was a full participant, negated this option. I therefore made notes against the checklist as the end of each day.

As part of this immersive process, informal group interviews took place (see Appendix Nine for a full list of the formal and informal interviews conducted). These were of the nature of professional discussions. I did not develop an interview schedule here but took the opportunity to develop conversations about what I was observing, ask teachers to explain more fully the topics I heard them discuss with their colleagues and to pose questions on the four themes identified in from the questionnaire. The socialising events were particularly conducive to this and I conducted a range of these over all the meals and other social activities. Informal interviews were also carried out at both competition events. At the AHT competition, I was able to talk to three other hairdressing teachers as we registered students. I also talked to two further teachers in the afternoon whilst we collated judging scores. At the

wholesaler competition, I talked to the wholesaler about his reasons for being involved in college life and the student competitions. Unlike the formal interviews at stage two, I decided not to record these more informal interviews as I felt that by doing so I would be overly intrusive. Instead, I took notes, with the respondents' prior agreement, and transcribed these at the end of each day.

I also carried out further formal interviews. I interviewed the chair of the ACPT at my workplace in March 2012 and the chair of the AHT in April 2012 at the AHT seminar/conference, adapting the interview schedule used at Stage Two. Formal interviews were also carried out with four AHT hairdressing teachers, again adapting the interview schedule used at Stage Two. One took place at the AHT competition once it had concluded (respondent B). Two of these took place in-between events at the AHT seminar/ conference (C and D). The final interview took place at my workplace (E). I also interviewed, formally, one of the competition judges. All these interviews were recorded and fully transcribed.

Casting the Actor-Net more widely

It became apparent fairly quickly, that teachers do not work in a vacuum when attempting to engage with CPD for occupational development purposes and there are three potential external networks that impact on this. First, and probably the most influential, is the employing college. I therefore conducted an in-depth interview with an HR manager for a large college, who also had the remit for staff development. The second external impact is that of the legislation. I therefore interviewed one of the IfL executives to gain their views of CPD for occupational purposes. The third area of potential impact emerged from the AHT hairdressing teachers. They have had a long established requirement from HABIA, the hair, beauty, nails, spa therapy, barbering and

African type hair sector skills body, that all teachers and assessors carry out 30 hours of occupationally related CPD per year. I felt it important to canvass their views and carried out an in-depth interview with a HABIA representative in April 2012. The requirement is enforced and monitored through two awarding bodies, the Vocational Training Charitable Trust (VTCT) and City and Guilds. I carried out in-depth interviews with representatives from both awarding bodies in May and June 2012 (see Appendix Eight for the interview schedule used with all these stakeholders). The interviews with all these stakeholders were recorded and fully transcribed.

Summary

This chapter has offered an ontological and epistemological position for the research. The three stages of questionnaire, interviews, and 'following the actor' of how teachers develop their occupational expertise were explained and how each stage built on, and was informed by, the previous section. The following chapter presents the findings from the questionnaire and Chapter Six discusses the findings from all three stages using ANT as an analytical and conceptual framework.

Chapter Five: Findings from the questionnaire survey

Introduction

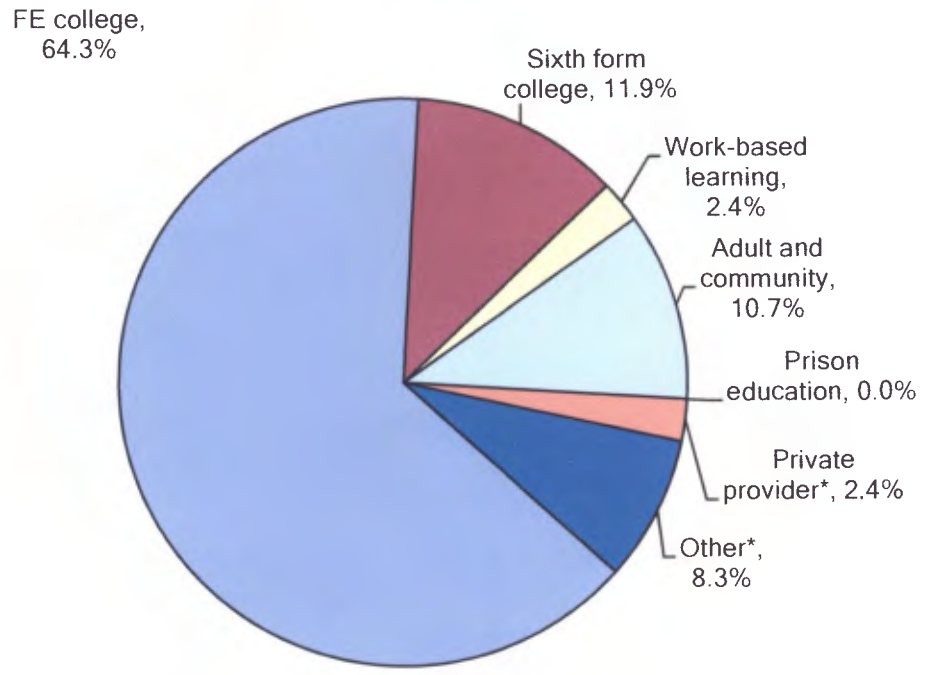
This chapter presents the findings from the questionnaire. The data is largely numerical and was analysed and presented using statistical means. Some qualitative data was also gathered and some of this, for example the subject and occupational specialism identified by the respondent, was coded in order that it could be presented numerically. Some variables were condensed to aid further analysis and these are described alongside the uncondensed variables. These and other variables were cross-tabulated to identify relationships and again these are described below.

Profile of the respondents

A total of 88 questionnaires were returned and 87 respondents indicated their gender with 62 (71%) being female and 25 (29%) male. This is in line with the latest work-force data which reported that across the sector, 70.9 percent of teachers are female (LSIS 2012). Seventy five (82.5%) questionnaires were completed fully, although the thirteen not fully completed contained very few omissions and therefore, all 88 questionnaires were included in the analysis. Chart One below, provides details on where the respondents were employed. The seven who stated 'other' with regard to site of employment all gave additional information about their employing organisation that enabled further categorisation. Six stated that they still taught in some capacity: one in a specialist college, one in a Police Training college, one schools, one in the community sector for a charity, one was employed promoting occupational health in the construction industry, one offered private tuition in pupils' homes,

and one worked for a university and arts organisation. The seventh had left teaching for work in the retail sector

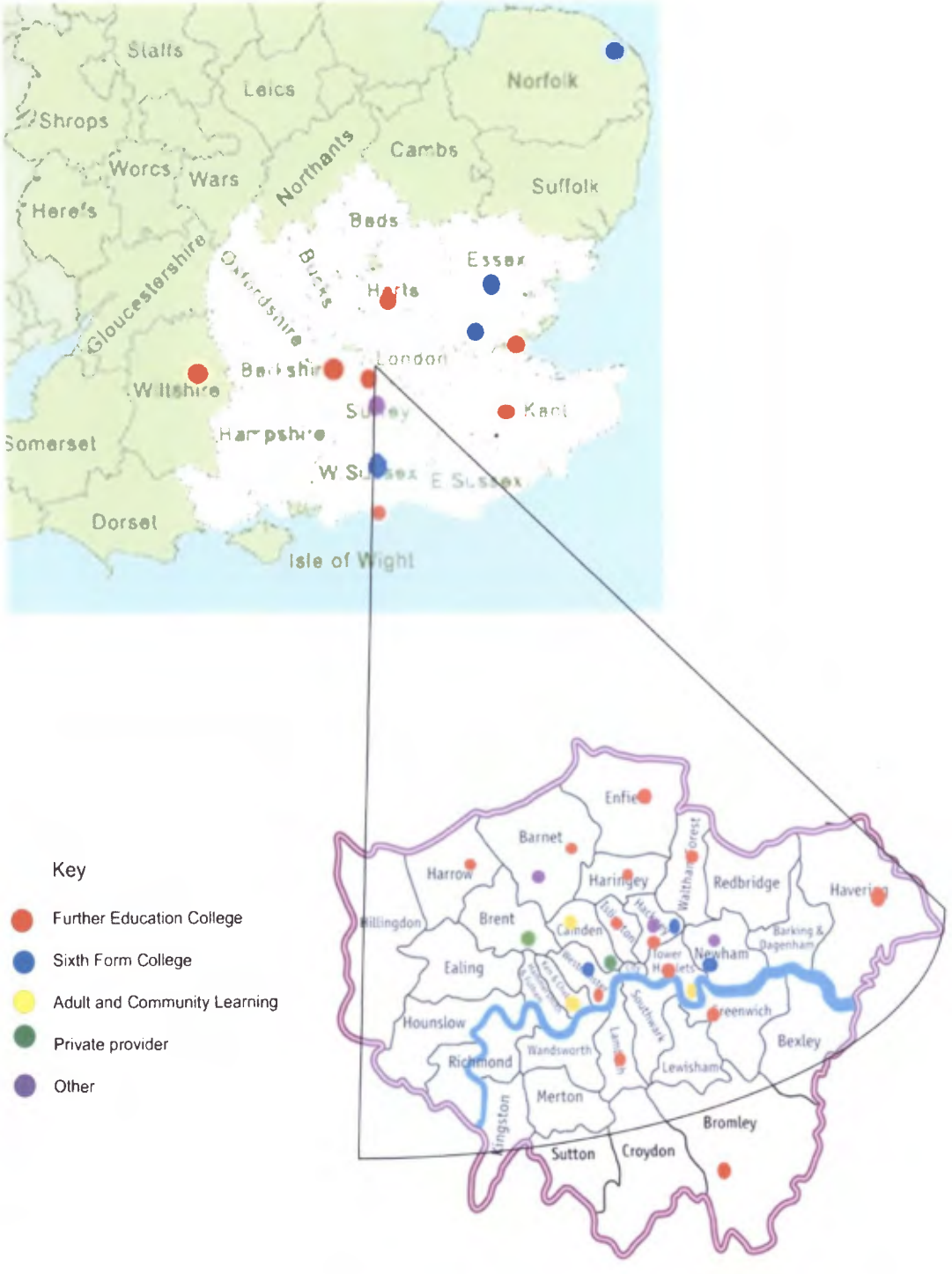
Chart One: Type of teaching organisation



Geographical spread of the teaching organisations

Where it was possible to do so, the organisations where the respondents taught were mapped. From the 83 respondents who still taught for organisations, the organisation could be identified for 70 (84%) teachers and are mapped in Figure One below.

Figure One: Geographical locations of employing organisations



Length of time since qualification gained

To indentify whether teaching experience had an impact on CPD activities, respondents were asked how long ago they gained their teaching qualification. Just over a third of respondents, 33 (37.5%), were either still completing their qualification or had completed within the previous two years. Twenty one (24%), had completed their teaching qualification two to three years ago, 23 (26%) four to five years ago and 10 (12%), more than five years ago (see Table One below).

Table One: Length of time since gaining initial teaching qualification

Answer Options	Response Percent	Response Count
Not yet completed or less than two years	37.5%	33
2-3 years ago	23.9%	21
4-5 years ago	26.1%	23
More than 5 years ago	12.5%	11
	answered question	88

This variable constituted four unequal categories and for the purpose of meaningful analysis, were recoded using SPSS into three categories: a) not yet completed or completed less than three two years ago; b) completed two to three years ago; and c) completed more than four years ago. This gave three categories where the outlining ones contained similar numbers of respondents: a) 33 respondents; and c) 34 respondents. This allowed those new into the profession to be contrasted with those who had been qualified for more than four years.

This condensed variable of length of time since qualification, therefore how experienced teachers were, was cross-tabulated against the organisation type where teachers were employed. The more experienced teachers were more likely to be employed in FE colleges and Sixth Form colleges, whereas the less experienced teachers were more likely to be employed in work-based learning, ACL or by private providers (see Table Two below).

Table Two: Type of organisation cross-tabulated against time since qualification gained

	organisation type					
	FE college	6th form college	Work-based learning	ACL	Private provider	Other
not yet competed or less than two years	15	2	2	6	2	3
more than 4 years ago	21	6	0	3	0	4
Total	54	10	2	9	2	8

Job roles

The majority of respondents (51/ 61%), were employed as main-grade lecturers and 14 (17 %) in some form of management position, either at course or departmental level. The majority of the managers (10) were employed at the lower level of course manager. All the respondents who indicated that they worked in a management role were employed in an FE college. A substantial

number of the respondents felt that they could not categorise their job role in this way and 19 (23%) gave 'other' and some offered further explanations. These included a police trainer, two who are now teachers in the schools sector, one employed in an advisory category, one a membership co-ordinator, one an IT assessor and one running an independent ESOL and literacy school (see Table Three below).

Table Three: Job role

	Response count	Response percent	Cumulative Percent
Lecturer	51	60.7	60.7
Course manager	10	11.9	72.6
Departmental manager	4	4.8	77.4
Other	19	22.6	100.0
Total	84	100.0	
Missing	4		
Total	88		

Type of employment contract

The respondents were employed on a range of contracts. More than half of the respondents were employed on contracts other than full-time permanent. Twenty two (26%) held permanent, fractional contracts. This means that they were contracted to teach for a proportion of a full-time contract, albeit on a permanent basis. Twenty (23%) did not hold a secure and permanent employment contract and were employed on either a temporary contract (four/

five %), or were more likely to be employed on an hourly, part-time basis, probably the least secure form of employment (16/19%). A further two stated that they were employed on a free-lance or self-employed basis (Table Four below). The data is in line with the most recent workforce data which reports that 40.3 percent of FE teachers are employed full-time (LSIS, 2012).

Table Four: Type of employment contract

	Response count	Response percent	Cumulative Percent
Full-time permanent	42	48.8	48.8
Fractional permanent	22	25.6	74.4
Temporary contract	4	4.7	79.1
Part-time hourly paid	16	18.6	97.7
Other	2	2.3	100.0
Total	86	100.0	
Missing	2		
Total	88		

This was cross-tabulated against condensed length of time since qualification. More teachers who had qualified more than four years ago held a full-time permanent contract (19) than those who were still gaining their qualification or had qualified less than two years ago (10). Conversely, newly qualified teachers were more likely to have a temporary contract (four to none of the more experienced teachers) or were employed on a part-time hourly paid basis (eight to six of the more experienced teachers).

In terms of employment contract, the respondents could be divided usefully and almost equally into two groups, with 42 (49%) employed on full-time,

permanent contracts and 44 (51%) employed on a range of other fractional, temporary or part-time contracts.

This condensed variable for contract type was cross-tabulated against organisation type. Twenty seven respondents in both categories were employed in Further education colleges. For Sixth Form colleges, only one teacher was employed on a contract other than full-time, which was part-time hourly paid, against nine employed on full-time permanent contracts. The reverse was true of ACL where teachers were more likely to be employed on contracts other than full-time permanent, with seven on contracts that are less than full-time permanent and two on full-time permanent contracts. This data for ACL teachers is congruent with the latest workforce data which reports that 15.4 percent held full-time contracts (LSIS, 2012). There were no teachers on full-time permanent contracts working for private providers and two on hourly paid contracts, the least secure form of contract used in the sector (see Table Five below).

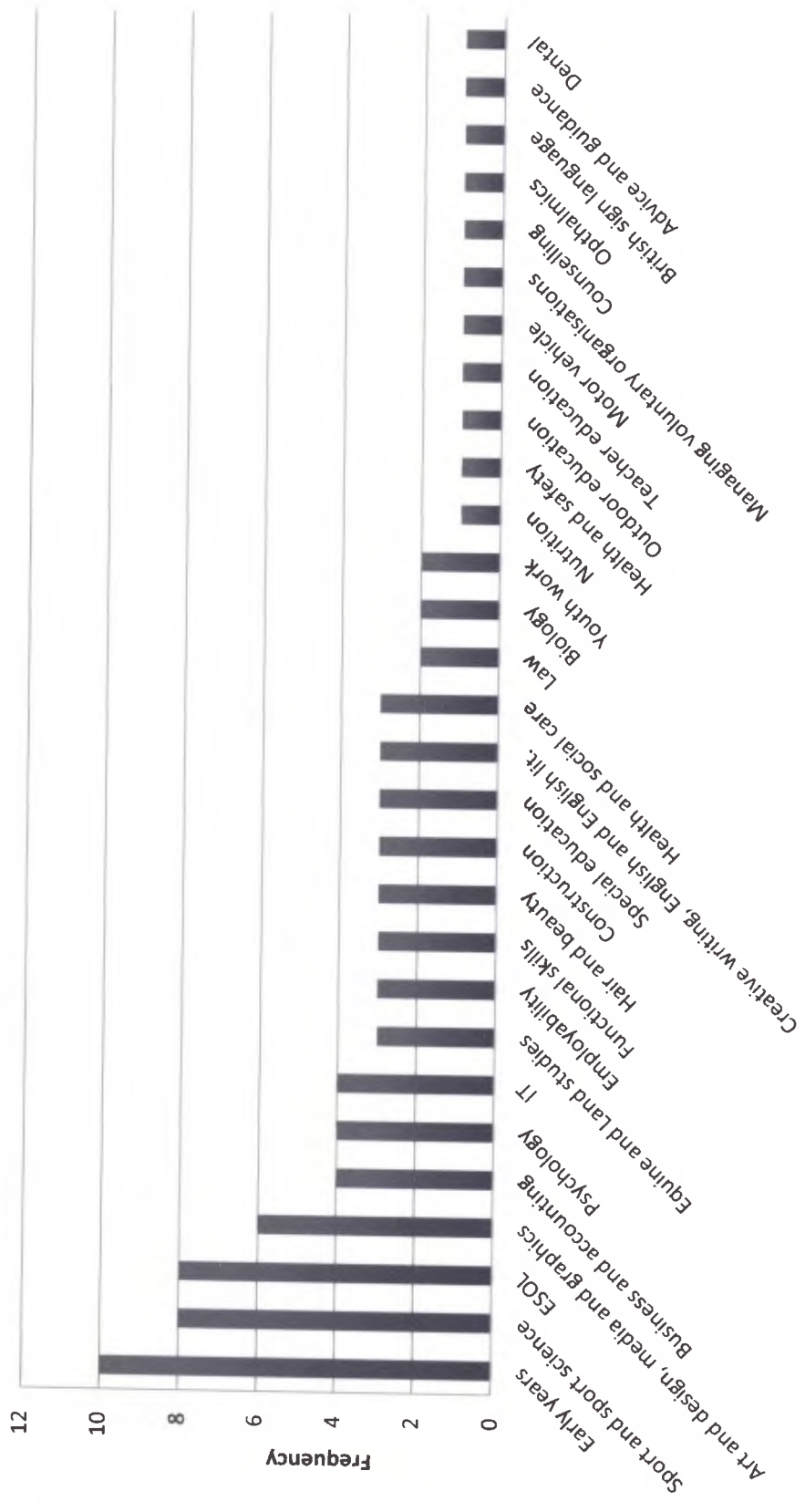
Table Five: Employment contract condensed cross-tabulated to organisation type

		organisation type					
		FE college	6th form college	Work-based learning	ACL	Private provider	Other
Employment contract condensed	Full-time permanent	27	9	1	2	0	3
	Other than full-time permanent	27	1	1	7	2	5
Total		54	10	2	9	2	8

How teachers describe their subject specialism

Respondents were asked to name their subject specialism. They were asked to self-categorise because I did not want, as researcher, to impose pre-determined categories that would influence their responses, rather I wanted to capture their own perceptions of the subject they taught. Some categorisation was used in the coding process, for example Hairdressing and Beauty Therapy teachers were categorised under 'Hair and Beauty'. Joinery, Painting and Decorating, and Plumbing teachers were categorised under 'Construction'. Functional, Key and Core Skills, both Literacy and Numeracy were categorised as 'Functional Skills'. Equine and Land Studies were also categorised into one. The final categorisation at coding was to group English, English Literature and Creative Writing into a single category. From 85 responses, there were 29 different subject categories. The most common subject specialism was Early Years with 10 teachers giving this as their subject specialism. Eight gave Sport Science and a further eight gave ESOL as their subject specialism. Six gave Art and Design, Media and Graphics. See Chart Two below for a full breakdown of subject specialisms.

Chart Two: Subject specialism identified by teachers



The extent to which subject is a perceived to be a specialism

Just under half the teachers (42%) reported being able to devote all their time to teaching their subject specialism. Eight (almost 10%) reported not teaching their specialism at all. A further 11 (13%), taught some other subjects alongside their subject specialism (see Table Six below).

Table Six: The extent to which subject specialism is taught

Answer Options	Response Percent	Response Count
Yes, all of the time	41.9%	36
Yes, most of the time	36.0%	31
Yes, some of the time	12.8%	11
No, I teach other subjects	9.3%	8
answered question		86
skipped question		2

Ten of the 11 teachers, who teach their subject specialism some of the time, work in FE colleges with one teaching in a Sixth Form college. They teach a range of subjects with no particular subject area being prevalent. Not all respondents stated which other subjects they teach, but seven did give additional information. Two teachers, one who teaches countryside management and one graphic design, both also teach functional skills. A business studies teacher also teaches tourism and, a painting and decorating teacher also teaches other teachers how to improve teaching practice. A literacy teacher is also a dyslexic specialist, an English teacher also teaches computing and an outdoor education teacher also teaches public service employment.

Of the eight teachers who do not now teach their subject specialism, three are sports science teachers who now teach business studies. A youth work teacher now supports students in their key skills development and a functional skills teacher now teaches first aid. Half of the teachers, who do not teach their subject specialism, hold full-time permanent contracts, three in Sixth Form Colleges and one in an FE college. One is part-time hourly paid and one is employed on a fractional, permanent contract, both in FE colleges. The remaining two gave 'other' for employment contract type and both are self-employed. One works as a private tutor and one free-lance in community development.

The importance of maintaining subject specialism

Teachers were asked how important it was for them to maintain and develop their subject specialism. All the respondents stated that it was important to some extent, with none of the sample seeing developing subject expertise as not important. Within this, the majority of 64 (83%) saw it as very important. The remaining 13 (17%) saw it as important (Table Seven below).

Table Seven: Importance to teachers of maintaining and developing subject expertise

Answer Options	Response Percent	Response Count
Very important	83.1%	64
Important	16.9%	13
Not very important	0.0%	0
Not important at all	0.0%	0
	answered question	77
	skipped question	11

The respondents recorded that their employers place slightly less importance on them maintaining and developing subject expertise than they do. Sixty two (80%), thought that it was important to their employer, however, 15 (almost 20%), considered that it was not important to their employer (see Table Eight below). Of these 15, 13 teach in FE colleges, with eight being on permanent, full-time contracts, three on fractional, permanent contracts and one being part time, hourly paid. These teachers taught a range of subjects with no pattern evident in the data.

Table Eight: Perceived importance to employer of maintaining and developing subject expertise

Answer Options	Response Percent	Response Count
Very important	41.6%	32
Important	39.0%	30
Not very important	13.0%	10
Not important at all	6.5%	5
	answered question	77
	skipped question	11

Hours spent on CPD activities

The mean number of hours spent on activities per year for professional development is 56 and the median is 36.5. The mode measure of central tendency shows that the most commonly recorded number of hours is 30 (Table Nine below). Standard deviation of 70.0460 shows that there is a large spread between the number of hours of CPD carried out. In order to verify the normality of the data, given the wide variation of responses, a range of statistical methods were used. Using 95% confidence interval for mean, to

remove the most extreme numbers given by respondents, the mean showed as 45.33 hours of CPD. This alongside the positive skewness value of 4.202 shows that there is a clustering of scores at the lower end of hours of CPD carried out. The kurtosis value of 22.479 shows that the distribution of hours is peaked which means that the majority of teachers are carrying out a similar number of hours of CPD.

Table Nine: Number of hours of CPD per year and number of hours spent on activities for specific purposes

		Number of hours of CPD	Subject updating hours	developing teaching skills hours	student needs hours	organisational needs hours
N	Valid	74	68	68	66	65
	Missing	14	20	20	22	23
Mean		56.01	20.35	17.32	8.18	9.15
Median		36.50	10.00	10.00	5.50	8.00
Mode		30	10	10	10	10
Std. Deviation		70.460	29.115	32.038	7.754	8.482
Variance		4964.561	847.694	1026.461	60.120	71.945
Skewness		4.202	4.223	4.326	3.138	2.280
Std. Error of Skewness		.279	.291	.291	.295	.297
Kurtosis		22.479	22.469	20.099	13.949	7.843
Std. Error of Kurtosis		.552	.574	.574	.582	.586

Respondents were asked to give the number of hours they spent on CPD for: a) subject updating; b) developing teaching skills; c) learning about meeting student needs; and d) organisational needs (Table Nine above). The mean shows that more hours were spent on subject updating (20) than for any other purpose. Developing teaching skills was the second most frequent reason for

CPD, with a mean of 17.32 hours. Just over nine hours mean were devoted to meeting organisational needs. Finding out how to better meet student needs was the least frequent reason for CPD, with a mean of 8.18 hours. These findings are similar to those of the IfL (2009), which found that CPD was split evenly between developing teaching skills and developing subject and occupational knowledge.

Respondents were also asked to rank these, from the most frequent to the least frequent. The most frequent reason for CPD was to maintain and develop subject expertise (27). However, a substantial number (16), put this as the least frequent. The least frequent reason was to meet organisational needs (26 respondents). However, 12 also stated that this was the most frequent reason for CPD (see Table Ten below). When this data was collated into most frequent and least frequent purpose, a similar pattern emerged. Forty five respondents gave subject updating as the most frequent reason for CPD and 46 gave meeting organisational needs as the least frequent.

Table Ten: Ranking of the purpose of CPD activities from most frequent activity to least frequent activity

Answer Options	Most frequent collated	most frequent activity	second most frequent activity	third most frequent activity	least frequent activity	Least frequent collated
Subject updating	45	27	18	8	16	24
developing teaching skills	39	17	22	25	6	31
learning about student needs	37	18	19	14	19	33
activities to meet organisational needs	24	12	12	20	26	46
					answered question	74
					skipped question	14

Activities undertaken to maintain and develop occupationally specific expertise

Teachers engaged in a wide range of activities for the purposes of maintaining and developing their subject expertise. The sum of the activities undertaken adds up to more than 100 percent and shows that teachers engage in more than one type of activity (see Table Eleven below). The most frequent activity is reading journals and books (60/81%). The second most frequent activity is accessing materials, resources or communities on-line (51/69%).

Table Eleven: Activities carried out by teachers for the purpose of subject updating

Answer Options	Response Percent	Response Count
Reading journals and books	81.1%	60
accessing materials, resources or communities on-line	68.9%	51
Attending a workshop	62.2%	46
Practising in the subject specific area	60.8%	45
Involvement with a professional body	58.1%	43
Attending a short course	51.4%	38
Peer observation	51.4%	38
Accompanying students on educational trips	32.4%	24
Organising guest speakers	28.4%	21
Attending a long course	18.9%	14
Shadowing someone in the subject specific profession	13.5%	10
Industrial placement	9.5%	7
Other (please specify)		5
	answered question	74
	skipped question	14

Workshops are also an important way that teachers maintain and develop their subject expertise (46/62%). A smaller number, though still the majority (38/51%), attended short courses. Activities that occurred naturally within the teaching work-place were also used by teachers and half (38/51%) used peer observation. Many worked alongside, and with students, to develop their subject expertise, with 24 (34%) finding value in educational trips and 21 (28%) finding value in listening to guest speakers organised for students.

Teachers maintained links with their original occupation. Forty five (61%) still practised their original profession. A smaller number were able to shadow someone in the original occupation (10/13%) and a further seven (9.5%) secured an industrial placement. More than half the sample (43/58%), used professional bodies for the purpose of subject updating. This appears to be an important aspect of the maintenance and development of subject expertise and was therefore explored separately through the questionnaire and is reported on later in this chapter.

CPD activities were cross-tabulated to ascertain the impact of contractual arrangements. Nearly twice as many teachers employed on 'other' contracts attended a long course (nine) as opposed to full-time permanent teachers (five). They were more likely to use peer observation for subject updating (22) as opposed to full-time permanent teachers (16). They were more likely to read journals and books (33) than teachers on full-time contracts (27) and were also far more likely to practise in their subject specific area (27) than the full-time permanent teachers (17). Teachers on full-time permanent contracts were more likely to accompany students on educational trips (14) than teachers on other contracts (10). These differences may be due to the amount of time teachers on different contracts have available to them. For example, teachers who do not teach full-time will have more time to attend courses and to work back in industry. However, they may also be working in their original industry or profession for financial reasons if they cannot secure a permanent contract,

and using this as subject specific development is a secondary, naturally occurring, consequence.

Barriers to engagement with CPD

Almost a third of respondents stated that there were no barriers to them in maintaining and developing their subject expertise (24/32%). However, for 28 (37%), funding of CPD activities for the purpose of maintaining and developing their expertise was perceived to be a barrier. Twenty eight (37%) also stated that they could not find the time to develop their subject expertise. Twenty two (29%) stated that they needed to prioritise CPD for other purposes over their subject specialist development (see Table Twelve below).

Table Twelve: Barriers to CPD for the purpose of maintaining and developing subject expertise

Answer Options	Response Percent	Response Count
I have no problems in maintaining and developing my subject specific expertise	32.0%	24
I could not secure funding	37.3%	28
I could not identify appropriate activities	5.3%	4
I could not find the time to develop my subject expertise	37.3%	28
I needed to prioritise other CPD activities over my subject development	29.3%	22
Other*	6.7%	5
*Other (please explain)		11
	answered question	75
	skipped question	13

Eleven respondents gave 'other' barriers to CPD for subject updating purposes. These included accessing funding (three further respondents). One of these gave a specific activity that they would like to secure funding for, which was

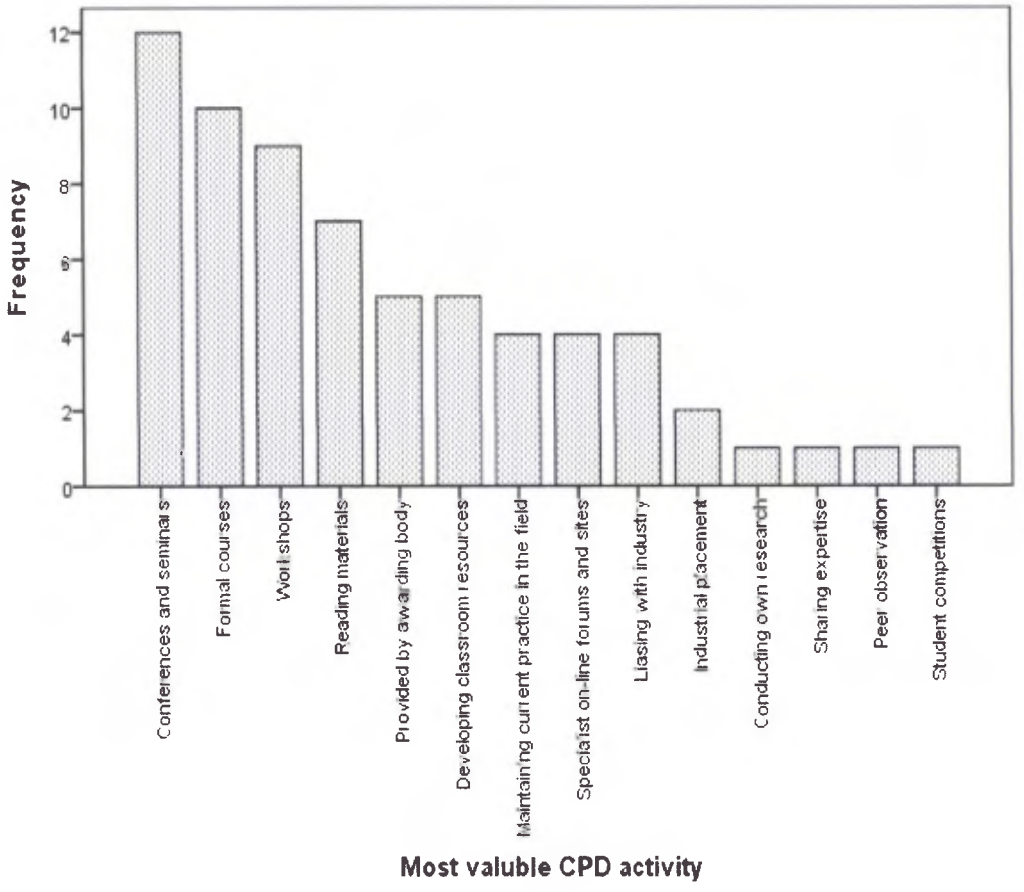
attending short, "master class" courses. Three mentioned organisational priorities that did not match with developing subject expertise. Four stated being employed part-time, rather than full-time, was a barrier and one taught a very specific subject that led to feeling isolated.

Barriers to CPD were cross-tabulated against condensed employment contract to explore whether barriers were greater for those employed on contracts which were less that permanent full-time. Securing funding was more of a barrier for teachers on the other contracts (16), than full-time permanent teachers (12). Teachers on other contracts were more likely to have to prioritise other things over CPD for subject updating purposes (13), than those on full-time contracts (nine).

Identifying valuable CPD activities

Respondents were asked to give examples of useful and valuable CPD they had done to maintain subject and occupational expertise. These were coded into 14 categories to enable analysis (see Chart Three below). The most frequently mentioned activity was attendance at seminars (12/18%). Teachers valued these when the key presenters were, "authoritative peers" or, "international". The second most frequently mentioned activity was attending formal courses (10/15%). The type and length of the course varied widely from Masters study in the subject area, through to short courses that were practical and applied. These short courses included a five day chair-making course to learn new skills in woodworking, covering traditional and new techniques.

Chart Three: Self identification of the most valuable CPD activities



A similar number of respondents (nine/13%), had found value in attending workshops. These included workshops on, "strategic management", "oral health" and those provided by manufacturers. One of the identified benefits of these workshops was that they enable practitioners to share practice. Seven (10%), found reading a variety of materials valuable if they were written by, "experts in the field" or about, "subject specific information". Five (7%), found opportunities offered by awarding bodies to be of value. These tended to be workshops on new standards and curriculum changes. The same number developed their subject expertise through developing classroom resources. Ten

(15%) maintained valuable links with their occupation. Four of these worked in their original occupation, four maintained other links with their original industry and two had been on industrial placement. New technology played a part in maintaining and developing subject expertise with four (6%) using specialist on-line forums and websites.

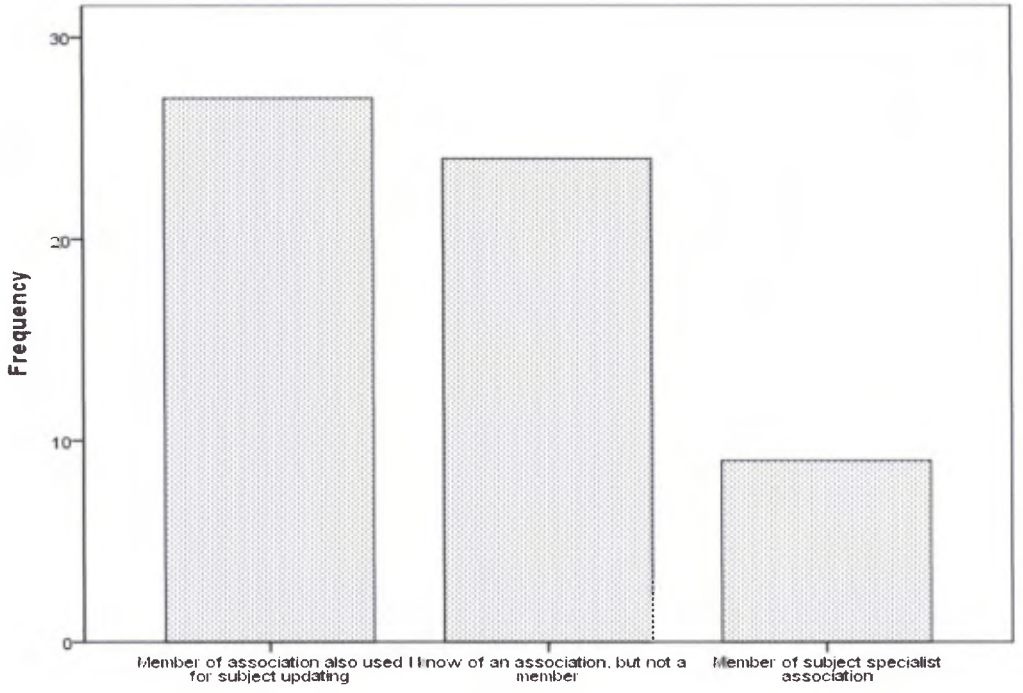
This largely supports the early findings that identified the activities undertaken to develop and maintain subject expertise. It also offers some explanations as to why an activity done individually, such as reading, can be valuable for teachers if it links to the development of subject expertise. Teachers are stating here that the materials they are reading are about their subject and often written by acknowledged experts.

Valuable activities were cross-tabulated with condensed contract type to identify whether there were any differences between those on full-time permanent contracts and those on other forms of contract. Teachers on other contracts were more likely to identify reading as beneficial (five) than those on full-time permanent contracts (two). These teachers were also more likely to find practising in their current field valuable (three) than full-time teachers (one), they were also more likely to find specialist on-line forums and sites helpful (three) than their full-time colleagues (none). They were also more likely to find liaising with industry more valuable (three) than their full-time colleagues (one). Finally, they were more likely to find developing classroom resources more useful (four) that the full-time teachers (one). The full-time permanent teachers were twice as likely to find conferences and seminars useful (eight) than those teachers on other contracts (four). Two full-time teachers identified industrial placement as useful, against none of the teachers on other contracts. These differences may be accounted for in the way that these teachers' work patterns are organised and that being on different types of contract opens up different opportunities.

The role of professional associations

Many teachers indicated knowledge, either first or second-hand, of professional associations that could be used for the purposes of maintaining and developing subject expertise. Respondents were asked three questions: a) whether they were a member of a subject specialist association for teachers; b) a member of an occupational association that could be used for this purpose; or c) whether they knew of either type of association but were not a member and sixty (68%) responded. Given that the existence of professional associations does not figure to any great extent on either the policy or literature radars, the fact that almost seventy percent could identify a professional association for subject updating is significant. By far the most prevalent type of association is a profession, industry or occupation based association that is also used for the purposes of subject updating by teachers, with 27 (45%) of those who responded belonging to an association of this type. A further nine (15%), belonged to a subject association solely for teachers. Twenty four (40%) had heard of a professional association that they could use for professional updating, but were not a member (see Chart Four below). Whilst almost a third did not respond to this question, that two thirds could identify a professional association that could be used for the purposes of maintaining and developing subject expertise is important and requires further exploration.

Chart Four: Professional associations that are or could be used for subject updating



Respondents were asked to name professional associations that could be used for the purposes of subject updating and in total, 66 different associations were given. It was not a simple task to categorise professional associations, as many serve more than one purpose. However, the organisations were categorised according to their main function as far as practicable from the information available from both the organisations' websites and my own knowledge of the FE sector. The categories were: a) Professional occupational associations that teachers also use (32); b) awarding bodies, sector skills councils and government agencies (11); c) subject specialist associations for teachers (10); d) occupational associations also providing qualifications or that require students to join (10) and; e) general professional teaching associations (three) (see Table Thirteen below for a full list of these).

Table Thirteen: Professional Associations Named by Teachers

Professional occupational associations that teachers also use		Awarding bodies, sector skills councils and government agencies	Subject specialist associations for teachers	Professional Occupational Associations also providing qualifications or require students to join	General professional teaching associations
American College of Sports Medicine	General Council of Naturopathic Practitioners	Central YMCA Qualifications	Association of British Sign language Tutors	Association of Accounting Technicians	Chartered Institute of Educational Assessors
Association of British Dispensing Opticians	Institute of Occupational safety and Health	City and Guilds	Association of Dyslexia Specialists in Higher Education	Association of Chartered Certified Accountants	Institute for Learning
Association of Professional Model Makers	Intensive Interaction	Health and Safety Executive	Association of Hairdressers and Therapists	BCS, Chartered Institute for IT	Higher Education Academy
British Canoe Union	Law Society	Institute of the Motor Industry	Association of Painting Craft Teachers	British Association for Counselling and Psychotherapy	
British Contact Lens Association	London Health and Safety Group	Joint Negotiating Committee for Youth Work	Association for Science Education	British Association of sport and exercise sciences	
British Dental Association	The Mammal Society	National Police Improvement Agency	International Association of Teachers of ESOL	Chartered Institute of Management Accountants	

Professional occupational associations that teachers also use		Awarding bodies, sector skills councils and government agencies	Subject specialist associations for teachers	Professional Occupational Associations also providing qualifications or require students to join	General professional teaching associations
British Design and Art Direction	National Child-minding Association	OFSTED	NAEGA: Supporting adult guidance for learning and work	Chartered Institute of Personnel and Development	
British Ecological Society	National childminding Association	Skills for Care	National Association of Teaching English and Community Languages to Adults	Institute of Career Guidance	
British Mountaineering Council	National Skills Academy for Social Care	Skills for Health, Care and Children's Workforce Development council	National Association of writers in Education	Institute of Engineering and Technology	
British Psychological Society	National Youth Agency	Register of Exercise Professionals (part of Skills Active, the sector skills council)	TALENT	Mountain Leader Training England	
Bullying UK	Network for Profound and Multiple Learning Difficulties	Skills for Justice			
Chartered Management Institute	Photo Fusion				

Professional occupational associations that teachers also use		Awarding bodies, sector skills councils and government agencies	Subject specialist associations for teachers	Professional Occupational Associations also providing qualifications or require students to join	General professional teaching associations
Complementary Medical Association	Play England				
European Baseball Coaches Association	Playwork London				
General Dental Council	Pre-school Learning alliance				
National Day Nurseries Association	Royal Society of Medicine				

For a number of subject areas, there was more than one respondent who named a professional association. The subject areas with the greatest number of respondents were English as a foreign language and second language (five respondents), childcare and early years (four respondents), and psychology, sports, art and ICT with three respondents from each subject specialist area. However, there was also only one respondent who could name a subject association for a number of subject areas. Most of the subject areas in the sample had an associated subject specialist association. However, there were some significant omissions. The two carpentry and joinery teachers did not identify a subject association, neither did the two employability teachers. For the carpentry and joinery subject area, this was surprising as this is a long-established subject area with a substantial history and culture. It is more easily understood for the employability subject area, as this is a relatively new subject and has little historical context or culture on which to draw.

Summary

The findings from the questionnaire reveal that maintaining and developing subject and occupational expertise is important to teachers. All the teachers in the sample stated that it was either important or very important to them. However, they perceive that it is less important to their employing organisation. Teachers engage with an incredibly wide range of activities. The most common forms of CPD for occupational purposes are through reading and on-line means. This goes against what is commonly accepted as the best forms of teacher development, that of collaborative practices but it is the content of what they read that is important in overcoming this. Reading materials tend to be written by, "experts in the field" and enable teachers to access experts from their original occupation or subject. Two key barriers to engagement with CPD for occupational development were identified; a), lack of funding and; b) lack of

time. It is most likely that the two are interlinked, as funding is needed to 'buy' time in order that teachers can be released from their teaching to attend events. A third significant barrier related to teachers having to prioritise other CPD activities over subject and occupational development. This may mean that there are conflicting demands placed on these teachers from their employing organisation. For many teachers, professional associations appear to play an important role in helping them to maintain and develop their subject and occupational expertise.

Whilst the findings reveal a rich pattern of activities and ways of engaging with CPD in order to develop subject and occupational expertise, it does not reveal the more nuanced aspects such as why this is so important to teachers, especially as there appears to be significant barriers that inhibit them from doing so. The following chapter takes this analysis further by discussing the findings from Stage Two, the interviews, and the findings from Stage Three, observations. The findings from all three stages are explored within an Actor Network Theory framework.

Chapter Six: Discussion of findings within a Actor-Network Theory framework

Introduction

This chapter discusses the findings from the interviews with, and observations of, vocational teachers. Also included are the findings from interviews with stakeholders and other informants. Alongside these qualitative findings, those from the questionnaire, presented in Chapter Five, are used to further illuminate the discussion.

The following chapter is divided into three main sections. The first section draws on the ANT approach of 'sociology of associations' (Latour, 2007), in order to identify and trace associations between the heterogeneous elements within teachers' CPD networks. Through this, the mediators that drive teachers to engage with CPD for occupational development are identified and explored. The second section explores the range of ways in which teachers maintain and develop their subject and occupational expertise. In order to do this, a range of ANT tools are employed to trace the ways in which teachers are able to develop new occupational knowledge and cross organisational boundaries. Throughout these two sections, tensions are identified that have the power to potentially inhibit teachers' full engagement with CPD activities and this is teased out more fully in the third and final section.

Why teachers engage in CPD activities for subject and occupational development purposes

Through using some of the ANT tools of 'associations' that help to explain how associations are made (Alcadipani and Hassard, 2010), and therefore how assemblages of action are formed, this section explores the reasons why teachers engage with CPD for the purposes of developing their occupational expertise. On the surface, this is not an easy task as there is an immensely wide range of subjects and occupations taught in FE. Within this study alone, of 85 respondents who gave their subject or occupational specialism, there were 29 different subjects taught (see Chart Two). This then begins to highlight both the complexity of the task at hand and also that these teacher CPD networks will be multiplicitous. Each teacher will follow their own particular subject or occupation. The task therefore, is to begin to identify commonalities within these networks to uncover firstly, whether teachers consider it important to maintain and develop their occupational expertise and secondly, to identify, in ANT terminology, the mediators that drive teachers to engage with CPD for these purposes.

The findings from the questionnaire (Table Seven) showed that it is extremely important to teachers that they maintain and develop their subject or occupational expertise. This is significant as it underlines the centrality of subject or occupational area taught to the professional identity of teachers highlighted by Robson (1998), who argued that it is the original, subject specific occupation, that gives FE teachers their credibility as teachers, and it is this that shapes perception of self.

The high level of importance that teachers place on maintaining their expertise is echoed in the amount of time they say is spent on CPD activities for these purposes, as opposed to CPD for other purposes. In the questionnaire, more than half the teachers said maintaining and developing occupational expertise

was the most frequent reason for CPD activity. They also say that they allocate the largest proportion of time to CPD for subject and occupational purposes. It is clear that the particular actor of subject and occupational development in some way exerts power within the teacher CPD network to, "...make others [the teachers] do things." (Latour, 2007:107). The concept of power as used here is that it is an attribute of the quality of network connections and not as a separate force, capacity or thing to be commanded by individuals (Jewson, 2007). It is also held within micro-interactions (Hamilton 2010), in other words, the extent to which one actor influences other actors within an assemblage or network. In order to understand the power that the pursuit of occupational development has within a teachers' CPD network, it is necessary to explore the network more fully and indentify how it has power to influence the network entities so as to make them act.

Identifying the mediators within the teacher CPD network

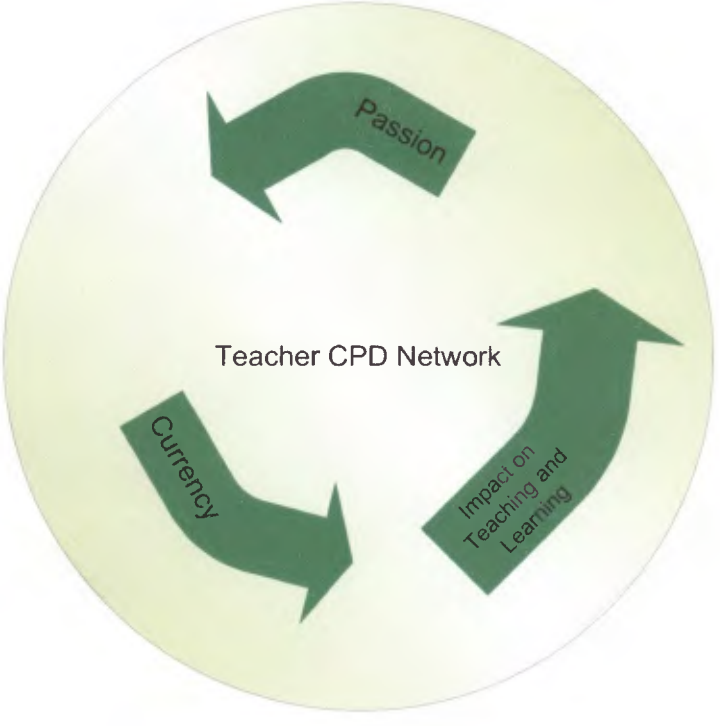
A useful approach from ANT for exploring the power of CPD for subject and occupational development purposes is through the 'after ANT' (Law, 1999) approach of defining actors or entities within the network, as either an intermediary or mediator. By tracing those entities within the network that have influence, enables an analysis of the reasons why teachers identify maintaining and developing their occupational expertise as important. An intermediary is an entity that conveys meaning through a network, "...without doing anything about it." (Boelens, 2010:39). In other words, without having impact or influence on the network, without changing it. A mediator is an entity that conveys meaning and that can, "...at the same time change, add or adjust something." (ibid, 2010:39). This type of entity has power to influence other entities within the network and it is this particular aspect of the process of transformation that is useful here. Using this concept of mediators, three

main entities within the teacher CPD network that mobilises or drives CPD emerge, as shown in Figure Two below. These are:

a) Passion for subject or occupational area
b) Maintaining occupational currency
c) Improving teaching and learning

These can be identified as mediators because they carry meaning for teachers (it is important) and it changes practice (this is why it is important).

Figure Two: A map of the mediators that drive CPD for occupational development



Passion for subject or occupational area

A common theme emerging from the interviews for why teachers engage with CPD was a high level of passion for their subject, skills and occupational area. Passion appeared to be evident no matter what it was they taught, the barriers they faced, or the contract type they were employed on. This was in terms of both what teachers said and evident in the amount of energy expended on occupational development. Using Law's (1999) analysis of how ANT can enable a move from exploring the social as a surface territory into a circulation, we can identify that this particular actor has high levels of circulation driven by the interrelations between the entities within the network. That this has high level of circulation is evident is the way that teachers themselves used the term 'passion'. The graphic design teacher said, "...the passion for it...certainly I'm very enthusiastic about design." The construction teacher said that he was, "...passionate about wood and my job, I do like knowing things about it."

Passion and enthusiasm was also evident in the energy and time exerted by teachers, even though the importance of occupational development, driven by the mediator of passion, does not appear to traverse into the organisation. Teachers said that their employer places little importance in them maintaining their occupational expertise, once they are employed, as illustrated here by the early years teacher:

> *I don't think they are in the slightest bit interested once they have employed you. So they employ you for your subject expertise, but after that...*

The construction teacher shed light on why this may be and stated:

> *But, it's not important to them, other things are and it's expensive. Like how would you go about maintaining subject specialism for carpenters and joiners? How would you go about facilitating that?*

> *You would have to get somebody in to show them a specific development and that's time, materials, money, space, all the rest of it you know and it starts adding up.*

Hence, colleges may not be providing appropriate activities for subject and occupational development and therefore teachers are active in managing their own development. Hairdressing teacher A, who is employed on a mix of fractional and part-time contracts, explained how she and her colleagues organise training events through manufacturers for students. Teachers also attend these, often in their own time, in order that they can access knowledge about new products and equipment. This reflects Lloyd and Payne's (2012) findings. Other teachers also say that they pursue development activities in their own time and largely at their own expense. The applied sciences teacher attends conferences and meetings concerning his occupational specialism at his own expense and largely in his own time. The time element of this is the most problematic for him as he is employed full-time. Similarly, the early years teacher accesses workshops in her own time, but finds this less problematic as she is a part-time hourly paid teacher. For her, the issues are more about funding, as these events are on the whole, self funded.

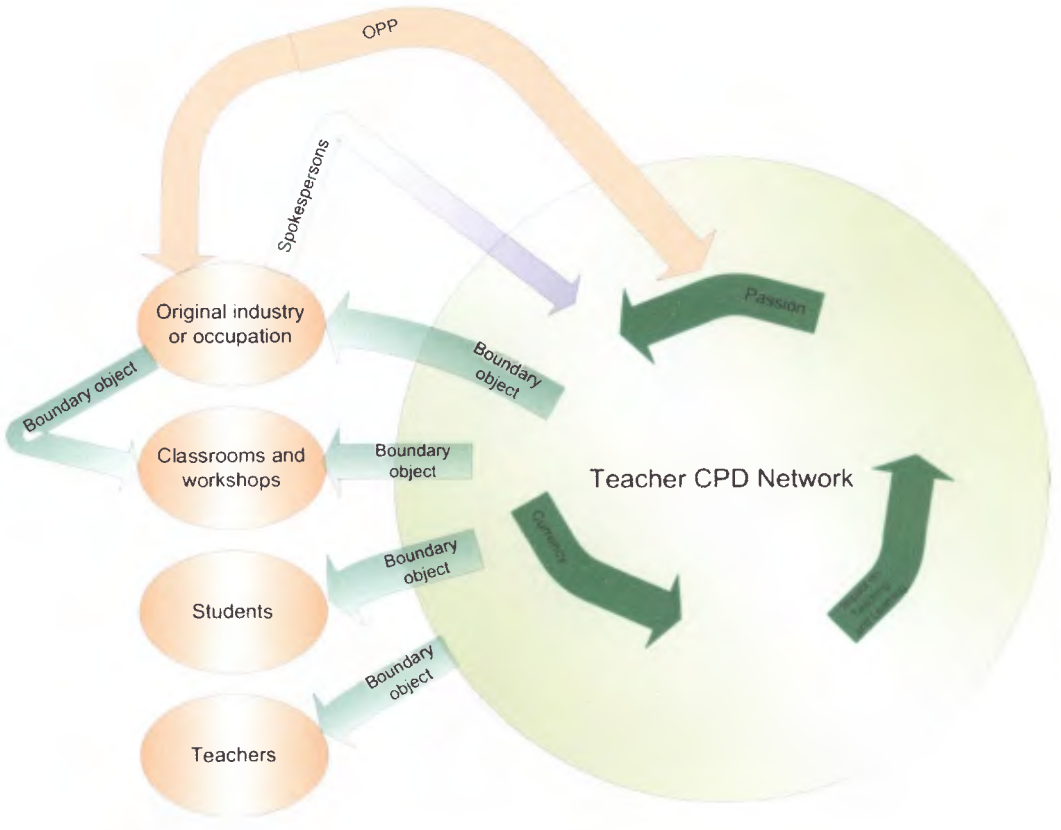
Given that colleges do not appear to play a large part in organising or providing these activities, it must be that the actors of subject and occupational development do not have the power to traverse into the organisational CPD network. This can be explained through the ANT approach of multiple worlds that coexist and overlap in the same material spaces (Fenwick and Edwards, 2011). What is important in this multiple ontological approach is, as Christiansen and Varnes (2007) explain, entities resist being enrolled into a network because there are competing possible networks to which they could belong. In other words, as explained by the construction teacher above, colleges have other priorities, other worlds, and this inhibits them being

enrolled into the occupational CPD world of teachers, driven by the mediator of passion.

This identification of the mediator of passion is not sufficient, however, in fully extending understanding of how entities within the teacher CPD network are influenced. Whilst it suggests that passion acts as a mediator, working to mobilise teachers to engage with occupational CPD, it does not explain what it is within the teacher CPD network that is working to influence or drive passion and why these teachers say they are passionate about their occupational area. In ANT terminology, it does not map other network connections, the other actors or entities, which connect and network in turn to the mediator of passion. A helpful concept in exploring this is that of boundary objects.

In the teacher CPD network, maintaining occupational expertise is closely related to the concrete practice of teaching and learning within a specific occupational area. Even though it may not bridge to the organisational boundary, the boundary object of occupational development can be seen to cross boundaries, connecting and bridging to other different worlds of occupation and industry. The boundary object of occupational expertise crosses boundaries between the original industry or occupation world, the classroom world, the students and the teacher, and four distinct worlds are traversed, as shown in Figure Three below, which I explore more fully shortly.

Figure Three: A map of the teacher CPD world, networked sites and network mechanisms



The subject or occupational expertise actor, driven by the mediator of passion, acts not only as a bridge, but as a portal into the other worlds. It enables the teachers, and their students, through their teachers, to see into the alternate world of the occupational area. This can be seen in the ways that teachers justify the passion they have for their subject. The graphics design teacher explained how his particular subject specialism acts as a bridge between industry and his own CPD. He explained that for him, this came from working in the occupation for a substantial amount of time. He said:

> *I have practiced and I know the reality and the pressures that bear on designers both in terms of the aesthetics and things and also the reality of commercial operation and making sure that you hit the deadline and making sure that the client is happy.*

The construction teacher explained it in similar terms, but also linked the past to the present, explaining at length the passion he had for traditional approaches to carpentry and joinery and said:

> *I am really into my subject, I love it. I love chairs as well as it happens, I think they are fascinating things, they are you know, they hold up the body but you know, it's almost like a negative shape of the human body if you look at a chair. But there are so many variations and types, I mean the variety of chairs out there are just incredible...England has a great history and culture of furniture making, like this particular chair and it's the Windsor chair and the development of that is just fascinating you know, it's not held together with any glue, there's steam bending involved, bending of the wood, shaping of the solid components and it takes a lot of knowledge to prepare this particular chair. It comes originally from the Windsor area, particularly around High Wycombe because they had huge forests of beech trees, pretty much all decimated now.*

Both the graphic design and construction teachers expressed some reservations, however, with having too much passion. They explained how they had worked within the occupational area, with people whom they felt exhibited these traits. The graphics design teacher said, "I have encountered obsessive designers, but I've not considered myself like that." and the construction teacher said:

> *I think also what helps in cabinet making is that you need to be a little bit OCD* [obsessive compulsive disorder] *you know, yeah, the*

> *best makers at that particular company did have that thing about detail, a real obsession with detail and you could clearly see it.*

The applied sciences teacher also identified with being overly passionate, bordering on obsession but did not view it as an issue. He said:

> *In* [the occupation areas] *we go crazy over minutiae, so you will have an association for fitting a special type of* [medical product], *you will probably get 200 people join that association. And it's not a brand but a special type of* [medical product]. *So we have associations for, within associations and it keeps on going.*

This concern of being overly passionate about subject or occupational area is further reflective of the interplay between the organisation and the teachers' CPD networks, and reinforces that the organisation is not fully enrolled or mobilised to respond to the occupational development needs of teachers. If they were, then there would, in ANT terminology, be traces of passion for both subject and occupational specialisms, as Latour (2007:31) explains, "...if a given assemble lies there, then it is invisible...If it is visible, then it is being performed..." Through this can be identified that the boundary object of occupational expertise does not cross the boundary, from the teachers' CPD actor-network, to that of the organisation. The organisational CPD network does not recognise the importance of subject, but sees the raising of the quality of provision as hinging on developing generic skills and responding to policy dictates. This can be seen in the comment from the HR manager when he explained that:

> *I don't think the first thing is let's make sure people are working on their subject specialist in response to raising the quality of teaching and learning.*

It is also evidenced in that all the teachers interviewed stated that they received very little support for their occupational development. This in turn means that the actual subject or occupational area taught, whatever that might be, is not a high organisational priority and high levels of passion for the occupational area would appear, if expressed within the organisation, as slightly odd. It is not what the organisation would expect the teacher to focus on. Rather, their focus should, according to the organisation, be on organisational priorities which were explained by the HR manager as, "You have this pressure to look at numbers and so on and so on."

Maintaining occupational currency

Occupational curriculum areas[2] within FE colleges, that serve the purpose of teaching and developing students for a career in a particular industry or occupational area, do not stand still. In ANT terminology, they have high levels of circulation. New developments within the original industry or occupation need to be reflected in both the curriculum and the pedagogical approaches. Extending the ANT analysis further, it can be identified why the maintenance of occupational currency is a key mediator or driver for teachers' CPD. What teachers are attempting to do, in maintaining their occupational currency, is to link across time and space. Time to ensure they are up-to-date, and space, learning about knowledge and skills, from one site to bring to an alternate site. This is explained by Law and Urry (2004), who state that elements, in this case new knowledge and skills, at one location have significant time-space effects elsewhere, in this instance, in learning sites. In other words, the actant of occupational knowledge and skills, acts as a boundary object, which according

[2] Occupational curriculum areas are made up of courses that lead students into a particular occupation.

to Latour (1996), links between the local and the global as shown in Figure Three above. Within the teacher CPD actor-network, the local is the teacher and students, and the global is the occupation or industry.

Changes that occur within the original industry or occupation are multifaceted and complex. They may be to do with developments in what the industry does, the introduction of new tools, or the impact of external influences. The applied sciences teacher explained the ways in which an associated occupation could impact on the curriculum he taught. He said that he and his students, when working in practice, would need to accommodate surgical techniques done elsewhere, by suggesting alternative treatments. The graphic design teacher realised that the actual conceptual and creative aspects of graphic design had not changed, but the tools used had and said:

> *The actual manifestation* [of the finished piece] *is often by computer but in reality you have had to think about it and had considerations.*

He understood the necessity to be able use new technology in the form of specialist computer programmes for graphic design. He explained that, particularly for graphics, the use of software programmes has become more prevalent and is an essential tool for the designer. These packages constantly change and evolve. For other teachers, the imperative may not be directly related to the subject, but is more concerned with the impact of policy initiatives on the way things are done within the occupation area. The early years teacher said:

> *At the moment, everybody is talking about 'school readiness' as if it's going to be the be-all and end-all, the answer to every problem in primary settings...It's just, it's one of Mr Gove's* [the current Secretary of State for Education] *new phrases...*

Here we see how policy is impacting directly on teachers' CPD in two ways: First through the legislative requirement; and second, on the subject matter. Through this, we can see that the actor-network of both the occupational area, and policy, impact on the curriculum and in turn on CPD.

This demonstrates the complexity of drivers behind the mediator of currency. The pathways of keeping up-to-date with the occupational area are made up of a multiplicity of experiences that mean different things to individual teachers and are therefore a heterogeneous process, "...a chain of associations made up of multidimensional and evolving entanglements." (Mützel, 2009:876) By working as a mediator, the particular boundary object of occupational currency may have weak network connections for some teachers, as they may not be able to make strong network connections to the original occupational area. An example of this came from the graphic design teacher, who stated that the hardest part for him was, "Keeping a handle on these changes." This is because to keep abreast of the constant changes within the original industry or occupation, the networked entities need to continually circulate and perform. Therefore, even when it appears that teachers' actor-networks are secure, they are in fact, "...merely fragile associations of heterogeneous elements." (Christiansen and Varnes, 2007:286).

In order to make these networks more stable, by enabling strong connections across multiple worlds, a further assemblage of entities or nodes is required. Fenwick and Edwards (2011:712) describe nodes as, "...one thing becomes hooked to and even changed by another...and then to another, and so on, to form an assemblage that moves." This node making is an essential part of making these actor-networks more secure, because these boundary objects do not develop or circulate in isolation, or without the influences of other actors. The creation and management of boundaries objects requires both collaborative work and communication between the two worlds (Star, 1990). It cannot be achieved in isolation, and therefore needs to assemble other actants

within both networks, of teacher CPD and occupational area, to help build bridges in order to cross the actor-network boundaries. What is required is that other actors or assemblages work, through a process of interessement and enrolment, to cross the boundaries, to network across into the other worlds.

One example of a bridge, or assemblage of boundary objects, is spokespersons from the occupational or industry world who network to and through the teacher CPD world, as shown in Figure Three above. An example of a spokesperson from practice was given by the business studies teacher. He described how a talk from a National Lottery human resource (HR) manager facilitated, for him and his colleagues, a useful discussion around key HR issues for large private organisations. This was also used in the classroom for two reasons as explained by the business studies teacher. He used the experience to show students:

> *This is what's happening in the HR world in the private sector, in a large organisation.* [and also] *So it does show to the students that I keep up-to-date with what could be happening elsewhere*

In ANT terminology, the National Lottery HR manager can be seen as a spokesperson, as the reason why he has credibility to lecture to business studies teachers is *because* he is a HR manager for a large company. This expertise is a manifestation of his own actor-network of skills, knowledge, experience, contacts and the company he is employed by. Within ANT, spokespersons are seen as assemblages, rather than individual actors, because to exert their authority requires this other network behind them. Through lecturing to the business studies teachers, the HR manager, in ANT terminology is, for them, an obligatory passage point (OPP) (Callon, 1986a; Callon, 1986b). Callon (1986b) explains, within the process of translation, obligatory points of passage are an integral part of the problematisation process in that they are used to arrive at a particular solution to a problem. The HR manager provided a

solution to maintaining occupational currency by presenting a clear way to transfer up-to-date knowledge across time and space, from the occupational site to the learning site.

These OPPs that enable teachers to maintain occupational currency are not only framed as described by the business studies teacher above, but take many forms. They are however, often framed as 'experts' in the field. They often network in a multiplicity of ways, but what is common is that they bridge through time and space. This is most evident in the case of the construction teacher in that his potential OPPs might be either current or historically based. He explained that England has a grand history and culture of furniture making. He had attended a course on making a Windsor Chair and was extremely knowledgeable about the history of this chair, its place in English furniture making and its connections back to the great furniture makers of the past, such as Chippendale. He was also knowledgeable about current high quality furniture makers and discussed the works of John Makepeace, David Savage and Mark Fish. The difficulty in this example however, is in assembling these particular obligatory passage points. It was an aspiration of this teacher to spend time training with one of these modern experts, but he could not identify network trajectories to enable this to happen. It would require powerful circulation, both within and outwith the teachers' CPD network, so as to assemble a wide range of boundary objects into one strongly networked obligatory passage point.

Exploring and employing the OPP concept further, some of the links and relationships within the teacher CPD/ occupational area network, forged by OPPs, can be identified as 'symbiotic' in that there is benefit for both actor-network worlds in creating obligatory passage point. These symbiotic relationships can be seen to be coincident boundary objects as, "...work in different sites and with different perspectives can be conducted autonomously while cooperating parties share common goals." (Star and Griesemer,

1989:411). The more prevalent types of symbiotic relationships identified are between the vocational teachers within a department and industry relevant manufacturers. An example of this was given by a hairdressing teacher (A). The college where she teaches stocks particular manufacturers' products and in return, free places are offered on courses they run. For example, the teacher attended a bridal, long hair course with one manufacturer and one on hair colour provided by another manufacturer, whose products the college was using. The construction teacher described a course he had attended that had been provided by a manufacturer of joinery equipment and tools that was also a symbiotic relationship. When asked why this course was provided, he answered that, "It's research development for them too." The manufacturer was gaining from those attending, their professional opinions of the tools. They are symbiotic because, not only is the teacher developing subject knowledge, but the manufacturer is able to reinforce themselves as the only alternative, as offering the most reliable products. In Callon's (1986a:6) words, they have, "...establish[ed] themselves as an obligatory passage point in the network of relationships they were building...which renders them indispensable."

This exploration of the mediator of currency, transported across time and space, that enable time-space to be spatially compressed (Nespor, 1994), begins to explain one of the ways in which vocational knowledge is different to traditional liberal notions of knowledge. It is applied in context and is alive. It carries particular meanings in context and across contexts and through this it is subject to change and adaptation. This offers an explanation as to why it is difficult to codify and transport vocational knowledge simplistically across contexts. The issue then, is how this currency can be recognised within a body of knowledge that has been codified and, if this approach is taken, given the ever-changing nature of vocational educational and skills, how often it would need to be recodified.

Impact of subject and occupational development on teaching and learning

To begin to identify and trace the mediator of improving teaching and learning, it is helpful to examine the ANT concept of time-space a little more fully. Nespor (1994), uses the experience of Berkeley physicists, who he argues, are closer in space-time to colleagues in Europe, than to migrant workers in the next county, and managers in New York closer to their counterparts in Tokyo, than the poor of the South Bronx. Through action, we can interact with, "...things in the immediate environment *and* with people and things spatially and temporally removed from us." (ibid, 1994:3). Applying this to vocational teaching and learning, the classroom and workshop can be seen as both geographical and metaphorical sites where passion and currency impact onto teaching and learning. They are geographical because this is where they are eventually enacted. They are metaphorical because knowledge is conveyed in abstract and complex ways, they are where stories of the original occupation are told. Because of these metaphorical links, teachers perceive that maintaining and developing their subject and occupational skills and knowledge, impacts positively on both their teaching and on their students' learning in a number of ways. In other words, they consider that it makes them better teachers. One reason centres on their concerns about their credibility as professionals, within an occupational or subject area. The early years teacher said:

> *...because with the teaching, you have got to get it right, because especially at level three and foundation degree, they'll all go away and say 'actually I think you'll find you are wrong' the law says this or something, so, probably that is a personal challenge as a teacher to get it right.*

Comments from other teachers illuminate additional ways that CPD impacts on teaching and on students. The applied sciences teacher explained the

importance of keeping up-to-date for his teaching. He began by saying that he could, if he wished to, sit back and produce the same materials for his students every year. For him however, it links to his interest in the occupational area. He said, "If you are interested and enthusiastic, you have to take a few opinions on board and you have to inform your students."

These two examples of credibility and enthusiasm further reveal the complexity of the teachers' CPD network. Credibility links to currency, and enthusiasm to passion, the other two mediators identified here. Through this, we can identify that mediators do not operate and work within the network separately. The mediators of passion and currency meet and work in a synchronous way on the mediator of improving teaching and learning. Latour (2007:220) explains this as:

> *Whenever a locus wishes to act on another locus, it has to go through some medium transporting something all the way; to go on acting, it has to maintain some sort of more or less durable connection. Conversely, every locus is now the target of many such activities, the crossroads of many such tracks...*

In the particular context of teachers' CPD, and for the particular set of connections identified here, the mediator of improving teaching and learning also acts on the teachers, driving them to maintain and develop their occupational expertise. We can identify this in the example given by the graphics design teacher who is funnelling, as an OPP, up-to-date occupational knowledge to his students. He is compelled to do this by the mediator of improving teaching and learning. His concern was with being topical and *au fait* with current industry practices and said:

> *Because if you don't know what is going on in industry then you are out of date and if you are out of date, then that is less relevant to your students who you need to pass information on to.*

The construction teacher was also working as an OPP, but in this example, rather than funnelling knowledge and skills from industry to students, he was working to funnel students into the occupation. His concern was how best he could ensure that his students were better prepared for, "the real world" of the construction industry. He could identify very clear links between his ability to do this, and him keeping abreast of current trends and new technologies within the occupation. He then linked this to curriculum design and ways of stretching his students' occupational knowledge and said:

> *I'm thinking ahead, perhaps not in the first year but in the second year, they are going to have all the work done, the minimum requirements, they are so good, there's a few of them actually, they are just chewing up the wood... keep throwing projects at them and they're just 'yeah, more, more, more' and so I'm just thinking in the second year when they have all the work done, to perhaps do something different, whether it's a bit of veneer work, whether its curved work where you know, we use vacuum bags, or some steam bending* [a technique he had recently learnt on a course].

These examples strongly suggest that teachers position themselves clearly as OPPs, thereby, "...enabling the novice to work/learn." (Fox, 2000:836). Through this, teachers accomplish a funnelling between the occupation and classroom, by, "...reframing or mediating the concerns of several actors into a narrower passage point." (Star and Griesemer, 1989:390). In other words, they hold the map that guides students into the occupational area.

A further way teachers act as OPPs, enhancing teaching and learning, is through being carriers of inscription devices. Latour (1987), defines these as a visual display of something that travels the world, connecting various points across space and time. For Latour, these inscriptions are charts, tables and maps. For teachers, they are a range of resources that they can gather up from the

occupational or subject site and bring to the teaching site. It may be as simple as being able to identify new teaching resources. The graphics design teacher uses catalogues that he collects at exhibitions to feed into his PowerPoint presentations. These resources act as boundary objects that enable translation though the process of folding. They, "...become circulated to link local sites." (Fenwick and Edwards, 2011:716). Edwards *et al* (2009), use this concept of folding to explore the literacy practices of students and it is used by them as an alternative to the concept of boundary objects. It takes further what they argue is the over simplistic notion of transfer suggested by boundary objects and the inscriptions that teachers bring into classrooms can be seen in similar ways.

However, I maintain that these inscription devices, which link actor-networks across space and time, are not only visual representations. They can also be articulated discussions. The graphic design teacher explained how information gained at exhibitions, can improve the level of dialogue he has with his students. He explained that, "You can just talk about this nature or that nature of the work." and that this gives both him and his students a powerful contextual reference for the projects that students may be working on. Similarly, the applied science teacher stressed the importance of actually working within the occupational area and that it enabled more informed discussions with his students. He said, "And it's good to be able to turn round to students and say 'when I was in practice the other day, I saw blah'..." Likewise, the construction teacher could also identify how, through conversations based on his recent CPD experiences, he could improve the experiences of his students. For him, this meant sharing his experiences with the students and entering into professional dialogs by discussing his recent experiences and asking such questions as, "What do you think?"

Returning to the ANT concept of obligatory passage points, we can identify these discussions as further ways that teachers ensure that they become OPPs to the occupational site for their students. They work in similar ways to

Latour's (1987:182) meteorologists who wish to make their weather predictions indisputable, "...to render the passage through their weather stations obligatory for everyone who wants to know about the weather." Similarly, these teachers are communicating to the students, if you want to know anything about the occupation, then come to me. They provide the link between the two worlds, of the students in the classroom and the occupational world that the students wish to enter. They also show that vocational knowledge is not just applied but is abstract and in this way can be transported across contexts. However, the ways in which practical and applied knowledge is transmitted is different, but not less than, for liberal forms of knowledge. It requires visual and aural representations. Therefore, to fully understand it, what is required is mirrored in Canning's (2012) arguments for a different language.

This section has identified the key mediators or drivers for CPD, for the maintenance and development of occupational expertise that are: a) passion for subject or occupational area; b) maintaining occupational currency; and c) improving teaching and learning. Through this, I have begun to shed light on the barriers that teachers face and begun to offer ways of understanding vocational knowledge. This section has also examined how teachers act as obligatory points of passage to operate as a bridge between occupation, and teaching and learning. As OPPs, teachers also act as a funnel between the occupational site and the learning site, bringing back and forth inscription devices, knowledge and skills. It has begun to explore some of the mechanisms that teachers use to maintain and develop their occupational expertise, such as working back in the original industry and by networking with manufacturers. I now want to explore these and other mechanisms more fully.

Individual pursuits, courses and workshops for occupational professional development

Teachers both collectively and individually engage in a wide range of activities for the purposes of maintaining and developing their occupational expertise. These follow a range of patterns from those done by the individual teacher to activities carried out in collaboration with others through courses and workshops. For some teachers, these take place away from the college where they are employed.

Individual pursuits

The most frequent activity for the purposes of subject updating is reading journals and books and the second is accessing materials, resources or communities on-line. This is an interesting finding as it suggests that teachers develop their expertise independently, through reading. In contrast, the literature identifies that collaborative learning, rather than individual learning, is the most effective form of teacher development (see for example, Hodkinson and Hodkinson, 2005; Goodson and Hargreaves, 1996; Hargreaves, 1994). However, that teachers use reading materials in paper and electronic mediums to help in maintaining their occupational expertise, does not necessarily negate them using other, more collaborative means. They also, in conjunction with reading, use a wide variety of other activities, as shown later in this section. What is important here is the nature of these written materials and who provides them. Often these reading materials are provided by professional associations and an example of these types of publication was described by the applied sciences teacher who is sent magazines from his professional association. For this particular professional area, the magazine serves two purposes. First, it helps support CPD by updating members through articles.

Second, it enables members to evidence their CPD by providing multiple choice questions that test understanding of the articles. These activities were valued by the applied sciences teacher who said that he enjoyed engaging with the content. Conversely, the business studies teacher felt that the material in the magazine he received from his professional organisation was of little practical use. He said:

> *They would be interesting if it was affecting the course I am running but it is very bland stuff that they write about...I think they are cutting back at the moment, it used to be a lovely, very big thing with pull-outs and things like that but it has gone very thin and not as much stuff.*

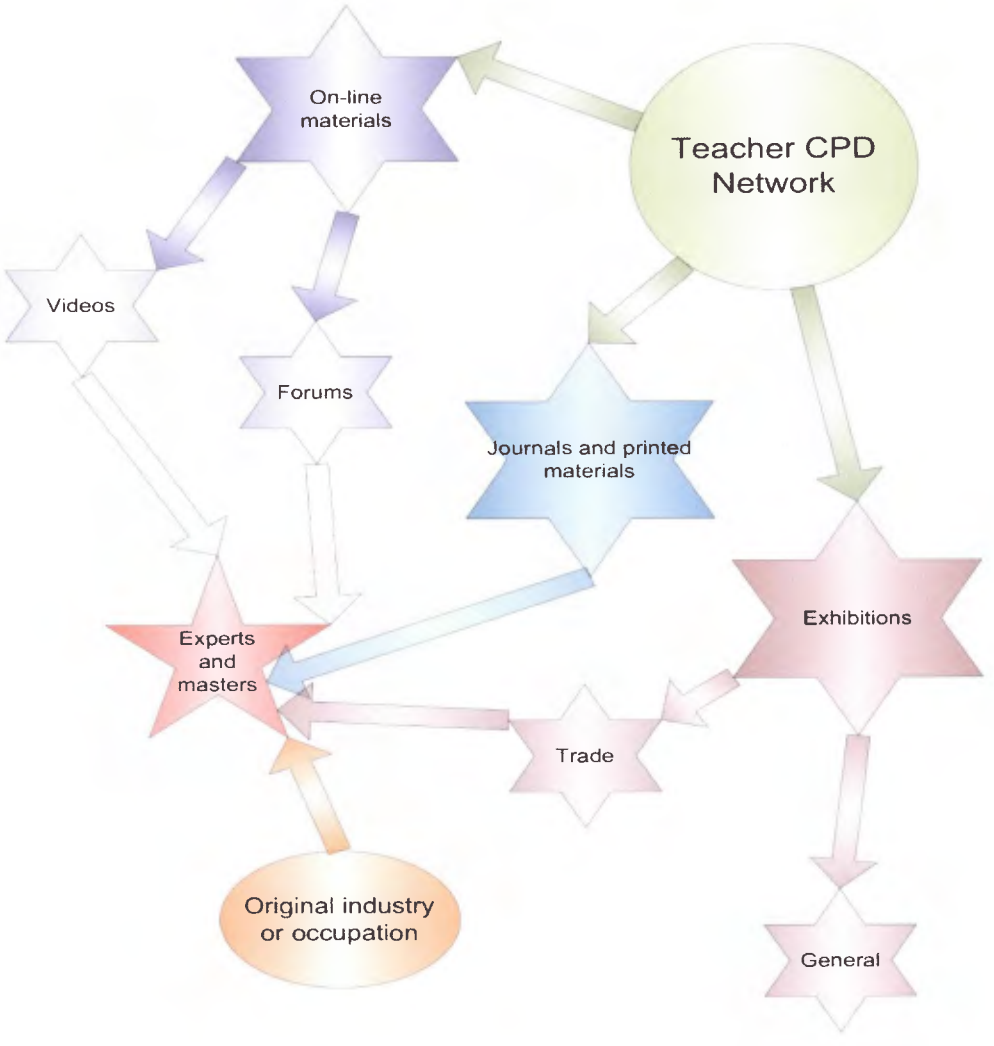
Not all magazines are provided by professional associations and many vocational areas, such as within construction and the hair and beauty industry, are served with trade magazines.

Electronic forms of individual learning can add further dimensions to paper based reading materials, for example through sharing with others. The early years teacher highlighted a chat forum, run by the British Association for Early Childhood Education. This enables her to share ideas and materials with other early years teachers. A second example is through visual media. Two AHT hairdressing teachers in the informal interviews conducted at the AHT regional competition, explained how they use 'You Tube' to access video clips on hairdressing methods. This enables them to develop new skills by watching the techniques being carried out and then practising these skills. However, a particular limitation with these electronic forms of learning is that they are not situated within context. In particular, the videos, whilst showing various techniques, may not enable transferability to other contexts, for example when working with other hair types. This decontextualised knowledge has similar

limitations to policy conceptions of work-place knowledge identified by Guile (2010).

Whilst it is recognised that these forms of professional learning are limiting, through ANT analyses, the benefits can be identified. They can enable teachers to quickly access the wider occupational world, it enables them to sit at the feet of the master, at a distance as shown in Figure Four below.

Figure Four: Map of teachers' individual activities for developing and maintaining subject and occupational expertise



In ANT terminology, they fold time and space. Nespor (1994), discussing undergraduate physics students describes subject disciplines as defining trajectories that bring students into contact with representations of other spaces and times, in order to make those absent spaces present in the form of texts. Here, we can identify the same process at work for these teachers, but rather than academic disciplines, what is being transported across time and space is occupational expertise. Quite often teachers derive their inspiration from 'experts' identified by both the teacher and those working in a particular occupation. The experts have, in ANT terminology, become, through the translation moment of mobilisation, the spokespersons for the occupation. As described by the construction teacher in the previous section, these experts may be historical, such as Chippendale, or modern masters currently working at the top of their field. Clearly, historical masters cannot be physically accessed, therefore, the only way to learn from them is through the second-hand means of books. For this teacher, even though he could identify, and had a deep level of knowledge of, both historical and current experts in his field, he had been unable to network to them physically and for him, actor-network connections could not be fully assembled. That he has this knowledge means he had to access them through these second-hand forms and in this instance, it has been partly through the trade magazines. They have become boundary objects, linking this teacher to the occupational actor-network. I would suggest that they are a particular type of boundary object, OPPs, which open windows into the occupational areas for teachers. In other words, they have framed an idea, intermediary or related entities in particular ways (Fenwick, 2009), and have enabled the folding of space and time.

These spokespersons can also be identified in the two types of exhibitions for occupational development purposes teachers attend. These are those aimed at the occupation or industry, and those provided for the general public, which teachers also use for CPD purposes. Of the exhibitions that are provided for the

industry, that described by the AHT hairdressing teachers, who were interviewed informally at the AHT committee meeting, is fairly typical. 'Salon International' is held yearly at one of the large London exhibition halls. It describes itself as being 'inspirational'. Much of the focus here is on selling products and equipment to those in the industry, but following the inspirational line, there are also a large number of demonstrations and 'cat shows' that enable, in ANT terminology, key industry spokespersons to showcase their creative skills and is represented in Figure Four above. However, HABIA, the sector skills body for the hairdressing industry, who require all hairdressing teachers to engage with 30 hours of occupationally specific CPD per year, do not see this as an appropriate CPD activity. A HABIA spokesperson said:

> *Just going on a manufacturer's course...or just going to Salon International* [trade exhibition]*...that doesn't expand their skills.*

However, an AHT hairdressing teacher, at the AHT committee meeting, explained that she found this to be a good way of her keeping up with the latest styles and fashions. Evident here, in the different perceptions of what counts as CPD, are the multiple worlds of the hairdressers, teaching their occupational area, and the standards body, setting the requirements. The exhibitions do not act as boundary objects between the teachers and standards body. They flow and circulate around the teacher CPD network and around the occupational and industry network, but are unable to cross the boundary into the standards setting world. In this instance, the process of translation has not been successful, failing at the moment of interessement, which is when one group of actors attempts to impose and stabilise their identity on other actors (Callon, 1986a).

The other form of exhibition that teachers use for occupational development are those open to the general public, but that also resonate with the occupational area of the teacher, shown in Figure Four above. For example, the

graphics design teacher had taken students to a Grayson Perry Exhibition[3] at the British Museum. He described the benefits as being able to access contemporary and topical developments that also have a graphical content and significance. He has also recently enjoyed a visit to the British Design Museum which he described as being of real benefit to his development. He said:

> *That was a great thing to look at, seeing the work, as a way of seeing stuff which has a significance to the industry.*

The use of this was contrasted with seeing design in books. He said:

> *When something is in front of you as a tangible artefact, rather than in a book, it sets the scale and that's certainly useful, any visit like that is useful.*

From this example it seems that for some teachers, using written materials are an impoverished form of CPD. They do not enable strong network connections to be made. For Edwards *et al* (2009), connections are made through the process of folding and it may be here that reading materials are not always powerful enough to cross space and time. This strongly supports the view that teachers act heterogeneously and that each will follow a unique path of CPD, finding personal and professional value for themselves. We can also begin to see that these paths are multiplicitous. For example, the construction teacher who found value in reading also described how he spends much of his free time going to museums in London and explained that, "For me it's not business, its pleasure." He described his visits to the Victoria and Albert Museum in London to see exhibitions on different furniture styles through history and said that the experiences are, "incredible". A smaller, but equally fascinating museum for this teacher was the Geffrye Museum in East London that exhibits rooms of

[3] An English artist who curated a collection of his own work alongside items from the museum's collection entitled, 'The tomb of the unknown craftsman' in 2011

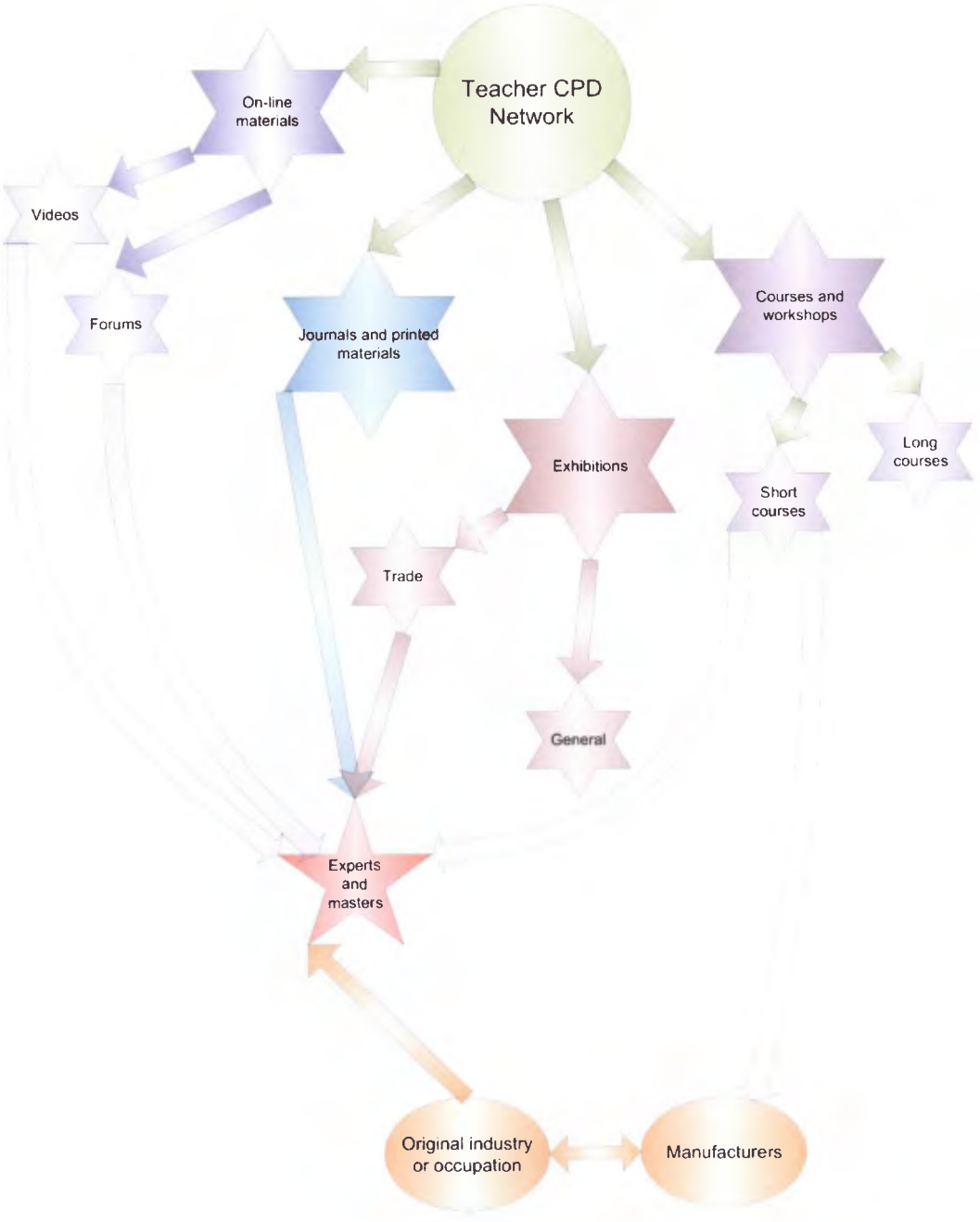
English interiors from different eras. From these comments, it appears that driving these activities is the mediator of passion, as identified in the previous section. Teachers want to, and are willing to, attend these events because they derive so much from them. Rather like Gomart and Hennion's (1999) musicians and drug users, these teachers, through a process of self-abandonment, enter into a world of strong sensations whereby active passion is performed as an actor within the network.

Courses and workshops

Courses also play an important role in enabling teachers to maintain and develop their subject expertise, offering a more interactive and participatory way of development. A variety of type and length of course were described by teachers and are further mapped in Figure Five below.

Fourteen teachers (19%) stated that they had attended a long course for updating their subject expertise. Examples of long courses were given by two teachers at interview. The teacher of students with learning disabilities is currently studying as an undergraduate for a BA in Education. The management studies teacher is currently completing a master's programme in Human Resource Management. However, even though a fifth of teachers accessed long courses, they were more likely to seek short, sharp opportunities that varied in length, from half a day to a week in duration, and 38 teachers (51%) said that they had attended short courses. Even more teachers, 46 (62%), had attended occupationally relevant workshops, which are short, often half day or one day events (Figure Five below).

Figure Five: Extending the activity map of individual pursuits



That teachers attend courses and workshops in fairly large numbers, is an interesting finding and initially seems to conflict with my earlier study (Broad, 2011), where teachers did not find value in courses and workshops, describing them as too generic and fluffy. However, explanations of this seemingly contradictory finding can be found in the nature of the courses, their purpose and focus, and who they are provided by. Those in my earlier study were provided by the teachers' employing institutions, whereby those being described here are often self-identified by teachers and often self-funded. The most important factor however, is the purpose of the course or workshop. Those described in the earlier study were generally designed in-house, to meet organisational needs and those in this study were for the purpose of occupational updating and development.

The courses and workshops here are seen as beneficial as they enable teachers to network and fold across to the occupational world. Teachers' engagement is driven by the three mediators, described in the previous section, of passion, currency and the enhancement of teaching and learning. These mediators, or drivers, transform and modify practice. Latour (2007), also states that mediators lead in multiple directions and again the activities can be seen here as self-directing and heterogeneous, as teachers follow a range of uniquely planned courses, drawn from their own particular context, occupational area and individually configured mediators.

Why these courses and workshops are more powerful than those provided by organisations is that, in similar ways to reading materials, they enable teachers to access experts and to sit at the feet of their own identified master. The early years teacher discussed how she was able to listen to Tina Bruce,[4] who she described as, "One of the leading lights in early years, she is amazing." However, this is not always an easy trajectory for teachers and they may not be

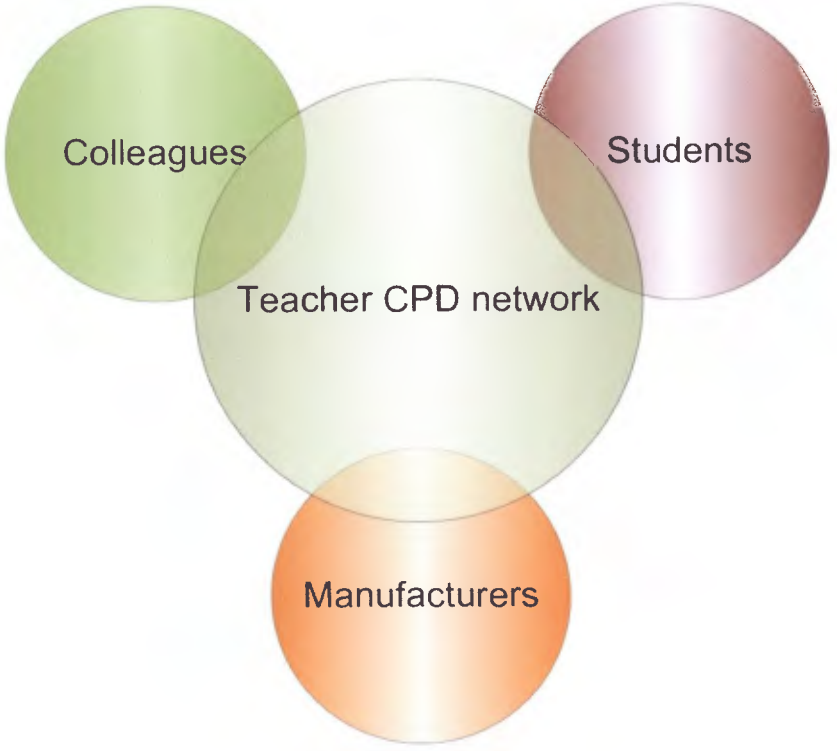
[4] An academic and consultant in early years and childhood studies

able to always use courses to connect with the occupational areas. This was the case for the construction teacher who maintained that he is always looking for interesting courses. The issue for him is that the most challenging courses tend to be run in Germany, but using tutors from other countries such as Japan. Surprisingly, the barrier to attending these courses is not language, as they tend to be taught in English, but the cost of the courses and, of course, attending so far from home. It is in these instances that teachers fall back on reading and websites to bridge across into this alternate world. However, where teachers can connect such as for the hairdressing and early years teachers, and through the week long Windsor chair making course described by the construction teacher, they are more powerful than reading. This is because these courses act as nodes which, according to Nespor (2003), are networks of action that are woven with so many commitments, identities and interests. In other words, these courses enable stronger and wider network connections to be made.

Collaborative professional learning within organisations

Even though teachers use a range of individual means for occupational development, they also find space within their organisations for more collaborative and informal activities. Emergent are three distinct, organisationally based, collaborative approaches: a) working with colleagues; b) working with students; and c) working with manufacturers, as shown in Figure Six below.

Figure Six: Collaborative learning networks within organisations



Three distinct ways that teachers collaborate with colleagues for occupational development can be identified: a) practising new vocational techniques and products; b) by attending student training events and; c) learning from new teachers who have recently moved from working in industry. The hairdressing teacher (A) explained two ways that she worked with colleagues to develop hairdressing skills and knowledge. Firstly, she and her colleagues would regularly stay behind after work to practise with new techniques and products, using the college facilities. One particular example used a cascade model of learning based on one teacher's attendance at a product training course. The hairdressing team felt it important that they were all familiar with its use and

benefits as they could then train the students to sell this particular product to salon clients. The second way they learnt was with each other through student training events. This is quite a common approach for hairdressing teachers and two of the AHT teachers also described using student training events. These events are organised for the students with outside speakers such as product or equipment manufacturers. When one of these events is planned, the rest of the hairdressing teaching team is informed and they can also attend.

The third collaborative approach identified was explained by the construction teacher as learning from new teachers employed by the college. New teachers tend to be fresh from industry, with a good level of knowledge of current trends, which is then passed on to the more established teachers. This was seen as vitally important in helping to maintain occupational currency for the more established teachers, further removed from industry, with potentially outdated skills and knowledge. This collaborative process could be described as a direct opposite to Lave and Wenger's (1991), initially simplistic notions of the journey from novice to expert, from peripheral to full participation. This chimes with Fuller *et al's* (2005) research in which they indentified the limitations of Lave and Wenger's concept of the 'novice' or 'newcomer'. In the example provided by the construction teacher above, we can see how a more complex multi-directional movement enables occupational knowledge to circulate through novice teachers and appears to be a relatively common method of development for vocational teachers.

The construction teacher gave two examples of this process. In the first example, he realised that for a whole class of students, a large number of the same amount of equipment is needed, which is costly for a college. Whilst working for a cabinet maker, he learnt how to use a specialist sticky tape, rather than traditional veneer holding clamps. This technique was passed on to his new teaching colleagues. In the second example, he explained how he was using a particular design software package with students. Whilst teaching this

to students, two colleagues watched his demonstration. After the lesson, the three teachers discussed its use. Not only did this benefit his colleagues, but he also derived benefit from this short, simple, collaborative CPD event and described it as, "...and as we spoke about it later, that's probably the best CPD we had done in a long time."

One concern however with internal collaboration, as described by these teachers, is that even though they derived benefit from it, it is the extent to which they are siloised within their own teaching teams and organisation through these approaches that is problematic. Christensen *et al* (2010), describes this siloisation as an inability to cross horizontal boundaries. In ANT terms, it can be seen as to the extent to which these types of activities do not enable teachers to build strong network connections, which enable them to cross boundaries to the original occupation.

This siloisation is addressed by some teachers moving outside their organisation to develop their occupational expertise alongside their students through educational trips (34 percent in the questionnaire). However, organising trips requires time and effort, as the graphics design teacher explained. He discussed the pressure of taking younger students on trips to exhibitions as they, "...just wander off at the drop of a hat." He also told of one experience where the students ended up having a fight in a gallery and in his words was, "so nightmarish." These student management issues were a key reason why some teachers do not use educational trips to their full potential and the construction teacher stated:

> *It's the organisation of it, I balk at that and think, do I want the headache? And I don't.*

This is addressed by some teachers by bringing the knowledge and skills into the learning site, rather than taking students to alternative learning sites. As we

saw in the questionnaire survey, 21 (28%) teachers found value in participating in guest speakers organised for students. The construction teacher said:

> *I would much prefer to have people come to them and it's what we have done, had specialists come in, delivering say new technology in laser levels and things like that.*

This reveals the complexity of the actor-networks and how they can quickly become mired in problems if the drivers, or mediators, are not the same for all participants. However, individual actors within the network, being shaped by different drivers, does not always have a negative impact and can open up potential for teachers, such as through working with manufacturers as explained by the construction and hairdressing teachers above and earlier. A further example was offered by the applied sciences teacher who attends seminars and conferences where much of the content is supplied by manufacturers. These examples reveal the symbiotic relationship, explained in the previous section on mediators, whereby each party aims to gain and is driven by different mediators. The mediator for teachers here is occupational currency and for manufacturers, as commercial enterprises, by marketing their new products, the mediator is increased sales.

Collaborative practices that enable teachers, students and manufacturers to learn and benefit from each other can be traced through the above. However, whilst these do offer benefits to all of these actors, there are two key problems. The first is that different mediators, or drivers, shape practice and therefore their input is never a good predictor of their output (Latour, 2007). Students may well be engaging in educational trips for learning, as a distinct aspect of their course, but in the wild, on the actual trip, it becomes more of a social event, thus leading to teachers finding their behaviour hard to mange. The second is that many of these internal events, even when they include

manufacturers, are bounded by the organisation, they are siloised and thus impoverished.

Collaborative professional learning beyond organisational boundaries and through professional associations

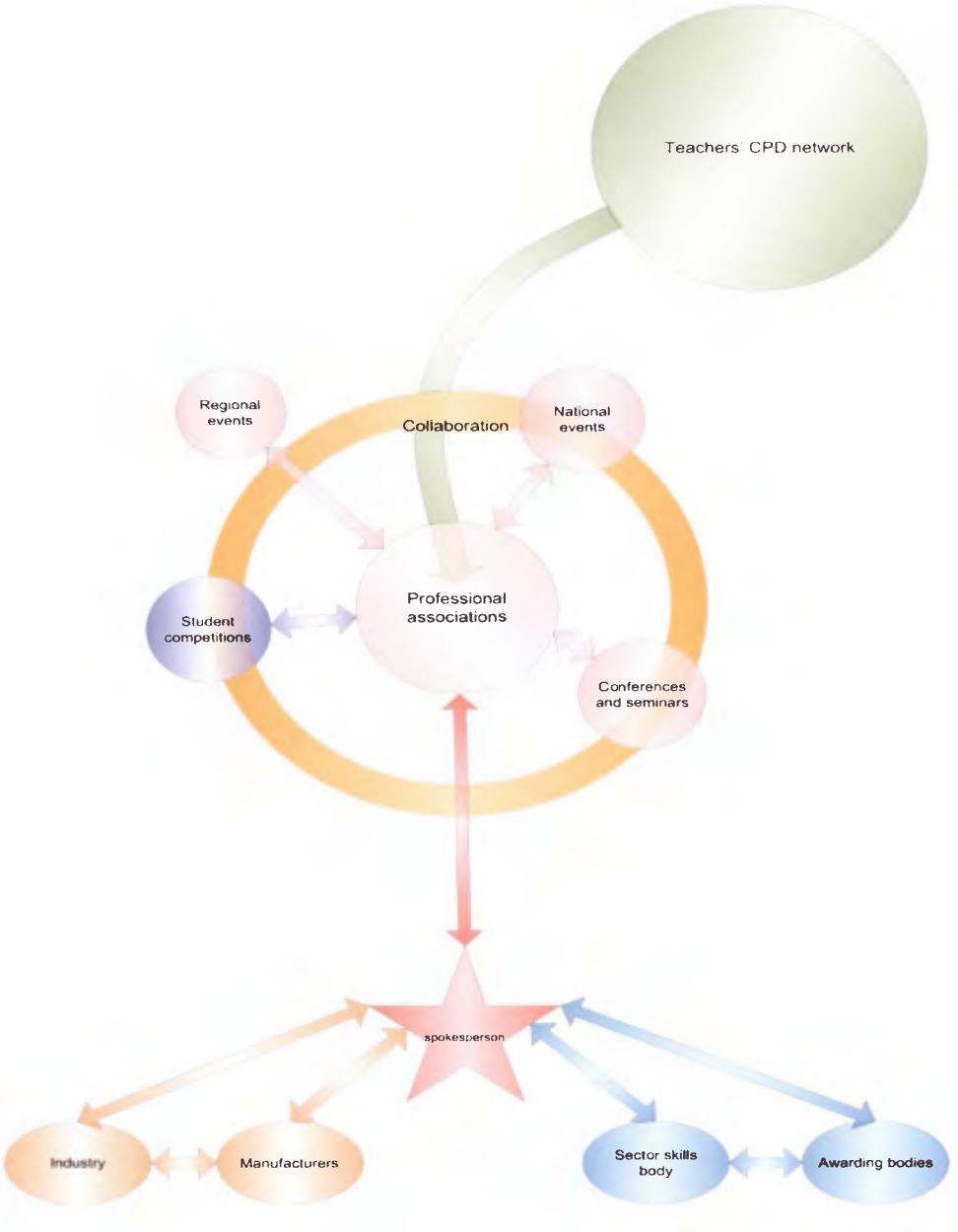
In order to explore the potential of professional associations in enabling teachers to maintain and further develop their occupational expertise, this section begins by presenting the extent to which teachers do, or have the potential to, engage with professional associations. I then turn to exploring the opportunities offered by professional associations to teachers in helping to maintain and develop their occupational expertise. Through this, I explore the mechanisms used. I then turn to how the mediator for teaching and learning can be traced through the activities. Finally, I examine the mechanisms by which professional association membership numbers and activities are built and maintained.

Collaborative opportunities for professional development provided through professional associations

As we saw from the questionnaire survey, teachers frequently use professional associations for CPD purposes. The reasons why professional associations offer such powerful ways that teachers can maintain and develop their occupational expertise, is that they present a forum for wide collaborative learning, through a wide and varied range of network connections that enable boundary crossing. The forms include student competitions, seminars, meetings and publications. These in turn enable numerous network connections that ensure the strength of these actor-networks as the more actors that are mobilised, the stronger the

network (Miettinen, 1999). These connections include industry, awarding bodies, sector skills councils and bodies, students, and teachers from other colleges (Figure Seven below).

Figure Seven: Map of teachers' collaborative opportunities through professional associations



They enable a high level of circulation, the importance of which can be explained through ANT in that the nature of actor-networks is that connections between actors, to ensure circulation and translation, are always being made and remade. A network will only remain stable if all actors, both human and non-human remain faithful to that network (Whittle and Spicer, 2008). It is through continually negotiating and re-negotiating links between the actors, through a high level of engagement through these activities, which enables a network to become stable.

One of the main forums for collaborative learning through professional associations is student competitions and these show-case events offer an opportunity for a very high level of circulation between teachers and students. The competitions run under the auspices of the AHT are national and includes colleges and students from England, Scotland and Wales. There are fourteen different categories of competition that are all held at the same time and the rules for each are set by the AHT. Students, with support from their teachers, decide which of the competitions to enter. These range from ladies day or evening style competitions, through to gents cutting and styling, to face painting, body art and nail art. This range of competitions enables students from both hairdressing and beauty therapy to enter and showcase the wide range of procedures that they are being trained to do. The competitions are organised in heats. The first heat normally takes place in the college with only students from that particular college competing. The winners from this initial heat then represent their college at regional competitions. There are six regional heats and the winners from these go on to the finals, normally held at the Winter Gardens, Blackpool.

Competitions also play a key part in the activities of the Association of Painting Craft Teachers (APCT). However, the APCT does not organise competitions directly, but is involved with manufacturers. Similar competitions are provided by hairdressing manufacturers and product and equipment wholesalers. An

example of competitions run collaboratively with manufacturers and wholesalers is one run by a very large hairdressing wholesalers in North London. How this differs from the AHT competitions is that rather than a range of competitions, there is just one that allows students to showcase many of the skills they are developing.

Further types of forum, which do not include students, are seminars and meetings. These offer ways of collaborating and sharing with colleagues, industry and other stakeholders across organisational boundaries. Professional associations tend to be organised into regions, mainly to make attendance at meetings and other communication between colleges easier. The number of meetings and how these are organised are determined by each region and are different within each. For example, the North West region of the AHT plans their meetings around social events that are put on in turn by each college within the region. The North East region of the AHT does not meet face-to-face, but communicates through electronic means, normally via collective e-mail. The South West region of the ACPT organises its meetings around CPD events and hold, according to the ACPT chair, "Saturday craft practical weekends." Manufacturers attend and run workshops on their products and the latest decorating techniques.

These multiple network opportunities offer spaces for collaborative professional learning that is largely driven by one of the three key mediators or drivers for subject and occupational development, identified in an earlier section, that of occupational currency. These mediators carry meaning through a network and at the same time change things in some way (Latour, 2007). In this instance, they drive teachers to ensure that their occupational knowledge is up-to-date. One AHT hairdressing teacher (C) explained the high levels of currency for hairdressing and said:

> *Our industry is based upon the lines of fashion and there are always changes, and there are the new awards that they are bringing out. New treatments. They might not be established, but as they become more widespread through the industry they become more established.*

The benefits of attending competitions as a way of keeping up-to-date, was described by another hairdressing teacher (D) who said that attending competitions enabled him to see current trends within hairdressing and he said, "You see the changes and the styles changing and the fashions and the colour trends coming through." He took this aspect of his professional development so seriously that he often took a camera to record the latest fashions being produced by teachers and their students from other colleges. Taking photographs is a common way of recording new trends and a further example of this approach was described by an AHT teacher (B) attending the regional competition. She was watching a particular competition where one student was creating a specific look, using the very traditional technique of 'fingerwaving'. Even though this is a well known hairdressing procedure, introduced in the 1920s, it is very difficult to do. The student working in the competition was using special clamps and tools to enable her to carry out the procedure. The teacher (B) commented that:

> *I've not seen that tool used in that way before. So I've taken some photographs and I'm going to go and get that tool when I get back.*

She further commented that she always learns something new at the events attended and explained this by drawing on the nature of the occupation in that it is very hands on and therefore, learning by watching is extremely beneficial for her.

Much of the learning that goes on through these activities, where teachers meet, is spontaneous and because of its nature, cannot be planned. Because of

this, teachers need to capture these events to remind themselves later on. The reason why cameras are used to record new or unknown techniques can be understood in two ways. Vocational learning is both tacit (Eraut *et al.*, 2000), and situated within context (Fox, 2000). Hence, these photographs become an easy way of remembering learning and thus allows for it to be transported to other contexts, in this case from the competition floor to the teachers' own professional development. This then leads to a further way of understanding these photographs as, in ANT terminology, they become inscription devices and circulate back to the teaching and learning mediator. In ANT terminology, inscription devices are a visual display of something that travels the world, connecting various points across space and time (Latour, 1987), and was also identified by the applied sciences teacher who used them to aid teaching and learning:

> *Oh my patients are always cropping up in my lectures. The pop up all over...I take an awful lot of pictures...when they have got interesting problems and bits and pieces*

In both these cases, cameras are acting as entities within the network, shaping practice and enabling teachers to produce inscriptions, or visual displays, that they can then use to carry new knowledge across space and time into the context of their own, and their students', development.

A further way that these collaborative network opportunities work is to enable teachers to cross boundaries. These are both organisational boundaries between colleges, and policy boundaries, between the teachers and sector skills bodies and awarding bodies. This boundary crossing is enabled by the strong collaborative networks that, in turn, assemble boundary objects that operate as bridges into these other worlds. Hamilton (2010:8), describes the role of boundary objects as being able to, "...make possible the framing and stabilisation of actions, while simultaneously providing an opening onto other

worlds." The framing and stabilisation discussed by Hamilton are through the common things that teachers discuss and share when they come together through the professional association activities.

One particularly strong boundary barrier between colleges, which is crossed through the boundary objects of these strong collaborative networks, is that in recent years, colleges have been set up, through funding mechanisms, to be in competition with each other for students. This has had a negative impact on how colleges communicate with each other. This approach was described as, "closed shop" by one AHT hairdressing teacher (D), who explained how a colleague from his nearest college, when at the AHT meetings together, would say, "I'm not supposed to tell you this...", and then lead onto a sharing of practice. An example of this was given as how to deal with problematic students as, "You can discuss and hear how they deal with problem students and the different ideas that they have brought in." One hairdressing teacher (E) explained that it was a good forum for enabling him to deal with problems and he said:

> *You can talk to people and when you talk to them you find out that they have the same problems as you have.*

In these particular instances, the boundary object is framed by location, by the assembling of a node that provides opportunities for discussion and sharing of practice within a specific geographical place and time. It is this node of geographical location coupled to the sharing of practice, which can be likened to Christiansen and Varnes' (2007) example, of immaterial shared vision, that acts as a boundary object enabling teachers to cross organisational boundaries.

Through the boundary object of immaterial shared vision, one impact of the previously identified mediator of improving teaching and learning can also be traced through the professional association network. An example of how teachers shared this was that one college had done away with theory lessons so

that the curriculum is taught only through practical application. In addition, the college had decided to have a series of workshops and the students attended on a choice based flexible basis, logging into a computer at each attendance, rather than by time-tabling. The hairdressing teachers shared this over an evening meal at the AHT seminar, discussing the advantages and disadvantages of this approach. The teacher from the college where this had been implemented fielded questions and assured that student retention rates had:

> *Shot up on the course because the students are doing more practical which is what they went there to do and less of the theory.*

This conceptualisation of the geographically located discussions, of boundary objects, was encapsulated by one teacher's (E) explanations of the benefits of these informal chat sessions, over meals and at competitions as, "Just talking to people you pick up ideas and often some of the things that they have changed, you think, I could go along with this."

However, these boundary objects of teacher discussions were not only geographically located and situationally located, within certain meetings and forums of the professional association. It is important to point out that even though boundary objects cross between multiple worlds and act as bridges between, they do not reside at the edges. According to Fleischmann (2006), these boundary objects do not sit at the edge of networks, but are situated firmly within the centre. We can identify the centrality of boundary objects within the actor-network through the way in which teachers often talked about the backup they provide each other with over distance and one hairdressing teacher (C) explained, "So it is good, you get a lot of backup from everybody." Another hairdressing teacher (D) explained that this collaborative networking occurred outside of planned meetings:

> *If you've got a problem you can just pick up the phone, ring up one of them and say we've got this problem, what would you do about it, what would you do?*

This was explained by another hairdressing teacher (E) who highlighted the breadth of collaborative working and said, "You network with all the different colleges up and down the country and you get to know so many people."

A final way in which the professional association activities enable teachers to cross boundaries is to other more distant worlds of awarding bodies and the sector skills body. In this instance, I am drawing on Gholamreza and Wolff (2009), who understand boundary objects as serving as an interface between worlds and similarly, these activities and forums serve as the interface between these worlds. This boundary crossing was described by an AHT member (E) who said that his membership enabled him to network, not only with other teachers, but with awarding bodies and the sector skills body for hair and beauty. From this we can see that movement is not just one way. Influence and circulation from both within and beyond the teacher CPD network, move back and forth, bringing power to bear on all actors within the network as it brings the individuals who work for these external bodies into the network and makes them three dimensional. For Star and Griesemer (1989), the role that these discussions take is as entities which inhabit intersecting worlds and that are both plastic enough to adapt to local needs, yet robust enough to maintain a common indentify across the different worlds. In other words, they have a common meaning across the multiple worlds, but also have different meanings within each of these. The AHT hairdressing teacher (E) explained that the head of the sector skills body will, "Sit and chat to you about everything, so he's quite open."

This sharing of information across boundaries was seen as incredibly helpful by teachers. Another AHT teacher (C), expressed concerns with the ways in which

policy changes are introduced and the lack of communication that teachers at the chalk-face, face. She explained that, "Sometimes changes happen by stealth." The benefits of belonging to the AHT were that:

> *The more people you are, that are talking to each other, you can advise and share with each other.*

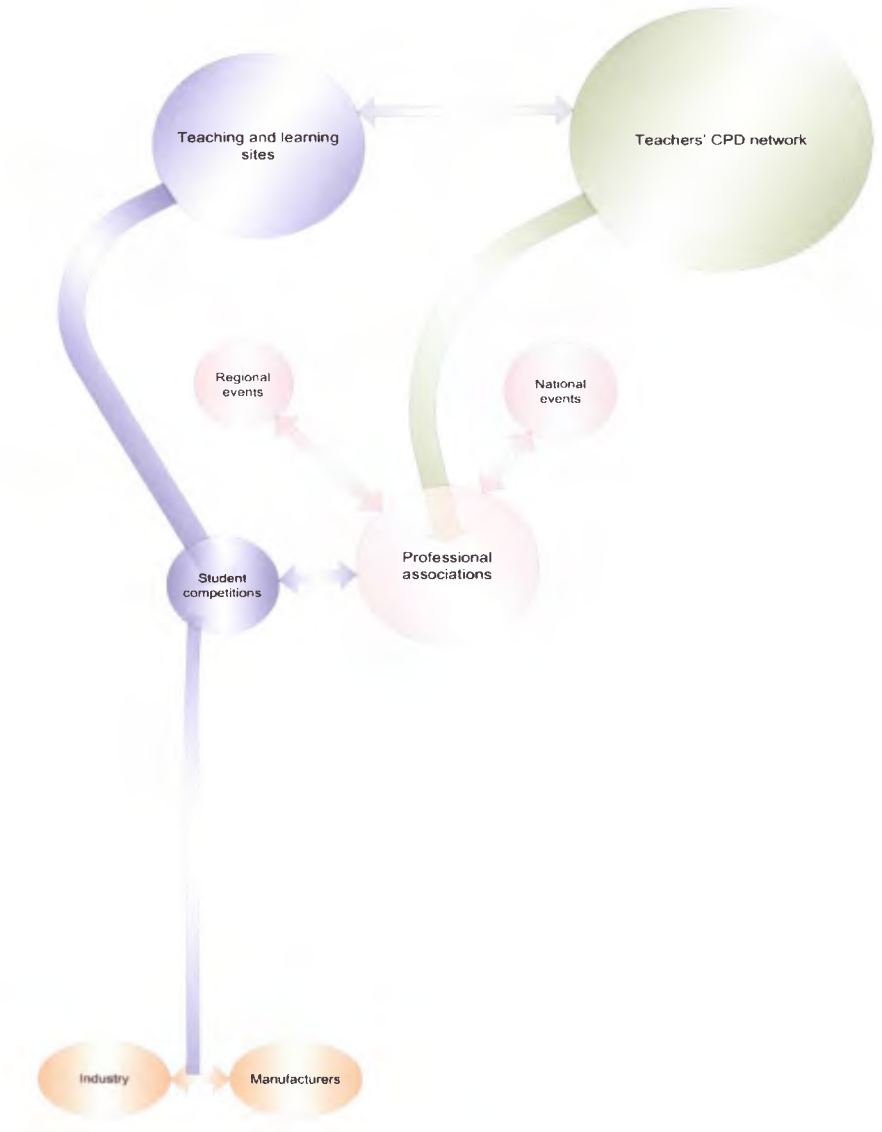
Through this we can see that not only is the AHT a way of developing vocational skills and knowledge, it becomes a communication tool, a way of finding out about government and policy changes that impact on vocational teaching and learning. It is also of benefit when there are changes to funding mechanisms and one teacher (C), explained a recent funding change, which in turn impacted on the ways in which the curriculum was organised. The same teacher said, "We shared and got the information from other colleagues." These actor-networks, linked by the boundary objects of geographical location, teacher professional discussions and other interested parties and bodies, enable different types of forces to be woven together, specifically because they are different (Latour, 2007). In other words, these different entities of teachers, sector skills body and awarding bodies impact and fold through time and space. This enables them, through the association meetings to coalesce and share both practice, and a more common and unified approach. This works in part because they are different and have different purposes and perspectives.

Tracing the mediator of improving teaching and learning through professional associations

So far I have explored the benefits to teachers of professional associations and indeed, this study concerns their professional development. However, students are also part of this process and I do not wish to disentangle their learning, or their integral part of the teacher CPD network mapped here. The professional

associations not only support teachers in their professional development, but work to aid student learning through a process of legitimate peripheral participation (Lave and Wenger, 1991). In addition, the competitions which professional associations provide can be seen to be mediated by the earlier identified driver of CPD, that of improving teaching, mapped in Figure Eight below.

Figure Eight: Tracing the mediator of improving teaching and learning through the professional associations



The first benefit the competitions offer students is a wider experience of the occupational area than just being taught in classrooms. This was explained by one AHT hairdressing teacher (C) who said:

> *A lot of them [the students] if they work in a salon, that's the only time they will get the chance to do things that are fun, that are creative. Most of them, not all of them, most of them will just work in salons every day, do clients and that will be it. A couple of them may get the chance to do things like that again. This is the opportunity for them to do it and to me that is what hairdressing is all about, it's being creative.*

Second, competitions bring students into the industry through enabling engagement (Wenger, 1999). It allows students to both broaden their experience and to identify with the wider occupation. One AHT teacher (B) explained this as, "I think it is important that the students don't see hairdressing as just salon work as it is so much more than just salon work." This was reinforced by a hairdressing teacher (A) who works with the wholesaler to organise competitions for her students, who said:

> *It's nice for the students. A lot of them if they work in a salon, that's the only time they will get the chance to do things that are fun, that are creative.*

Seen here is that the competitions are, through a process of folding, acting as boundary objects between different worlds (Christiansen and Varnes, 2007), between the college as a learning site and the wider hairdressing profession. Not all the students will want to work in their local salon and the competitions provide a way in which they can build a wider range of skills and networked connections to the wider industry.

A third way in which these competitions enhances student learning is that they are seen to be an effective way of building students' confidence. Here we can begin to trace the mediator of teaching and learning through the network more widely, and in another way. One of the key requirements of being a hairdresser is having confidence. They deal with the general public on a personal level and therefore require good interpersonal skills. A hairdressing teacher from the AHT, who was interviewed informally at the AHT regional competitions, explained this as, "I think it is quite inspirational for them to come and see the competitions, see what goes on." She explained that students do not always want to take part in the competitions because of a lack of confidence, but, "When they see it, they think oh I could do that."

There are two further ways that the mediator of teaching and learning can be traced through the network as enhancing teaching and learning. First, the experience of competitions also builds standards both within the training environment and in the wider occupational area. A teacher (E) explained that:

> *I think it is good for them to see the standard that other people are working at and then they can but themselves in the perspective of where am I in that standard? And you know, it's not going to be easy because I think that a lot of people go into hairdressing because they think it's an easy job. And it isn't an easy job, it's really, really hard work.*

The second benefit for students, of especially the national competition, is not directly related to the occupational area, but can still be seen to link to the key driver of enhancing teaching and learning, through being seen as offering an enrichment programme. In this way, the experiences opened up to the students are not only the actual competition, but it enables students to experience another part of the country and also to become more independent. They travel with their teachers to Blackpool and stay in a hotel, usually for two

or three nights. They are responsible for organising spending money for incidentals and for their own meals. Through these examples, the mediator of improving teaching and learning can again be traced.

This section has revealed the heterogeneous and multiple nature of vocational learning. It is not sufficient to deliver narrow, instrumental programmes that just teach students how to do things practically within a vocational or occupational area. Teachers work hard to adopt a more process oriented curriculum (Stenhouse, 1975), by expanding what it is that they teach vocational students. This is because vocational knowledge is not just abstract, to be picked up and transported unproblematically. There is a wider set of interlinking actors and entities thus, vocational knowledge becomes wider than just the skills and knowledge from the occupational area. It also concerns both curriculum organisation, and developing students more widely. What teachers do when teaching vocational knowledge, is to bring students into the occupation, acting as OPPs to move students from the periphery towards the centre of an occupation.

Bringing in or keeping out: How teachers are enrolled into professional associations

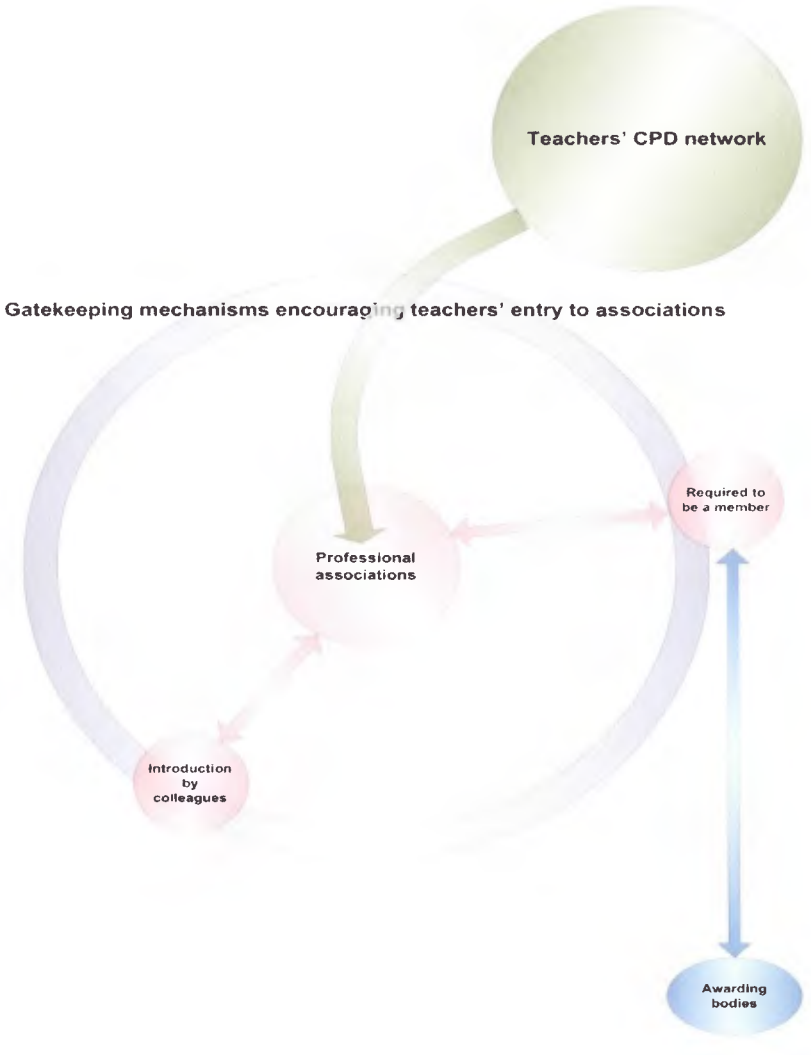
From the above, it is clear that professional associations provide identifiable benefits to both teachers and their students. However, this is not sufficient to maintain circulation as a network will only remain stable if all actors, both human and non-human remain faithful to that network (Whittle and Spicer, 2008). According to Law (2007), networks and interrelations are always insecure, and susceptible to failure. It is through continually negotiating and re-negotiating links between the actors that enables a network to become stable. The ways in which teachers, as actors within a network, are brought into a professional association is through a range of translation processes. This is

largely through the circulation of boundary objects and through OPPs. Bowker and Star (2000:289), conceptualise boundary objects the same as any other entity within a network, and can be, "...stuff and things, tools, artefacts and techniques, and ideas, stories and memories." Whist OPPs are, "Passage ways through which all the other entries that make up the world must pass." (Callon, 1986b:29). These two actor-network concepts are similar in that they both link alternate worlds. However, I suggest that here, OPPs have more power than boundary objects as they work to enrol teachers into the professional association network. Whilst boundary objects carry meaning across networks, OPPs funnel and act as gatekeepers, determining who is brought into the network and who is left out. In the case of professional associations, the OPPs and boundary objects are translated through either coercion, as a requirement, or through a process of socialisation, as shown in Figure Nine below.

Two teachers gave examples of the coercive nature of enrolment into a professional association, which seems to be more prevalent in industry professional associations. The first was that of the business studies teacher, whose professional body is also the accreditation body for the qualification he teaches. This provides coercive power to the professional body as, in order to offer the qualification, at least one teacher in each college is required to be a member. For him, this set of relationships, between the professional body, the teachers, the qualification and course, and to some extent the students have become 'black boxed', "...when many elements are made to act as one." (Latour, 1987:131). In this instance, the network is fully enrolled and mobilised. It is taken for granted that all entities become part of the network, the professional body. The second example is that of the applied science teacher who is strongly encouraged to maintain his registration with his professional association by the credibility this brings him. He explains that it would be "frowned upon" if he let this lapse. This network has also been black boxed as shown by the high expectation on him of being a member. Membership is

framed as professional standing and is required to demonstrate an appropriate level of professionalism.

Figure Nine: How teachers enter professional associations



To ensure continued and active membership, the obligatory nature of these two professional organisations means that they provide activities that can be used for CPD purpose by their members. The business studies teacher explained that he is required to attend a yearly conference. The applied sciences teacher explained that his professional body provides occupationally specific CPD. This

could be in the form of an article in a professional magazine and accompanying multiple choice questionnaire, or attending events such as workshops or conference. These coercive factors, within the black box of these professional associations are boundary objects, linking occupational knowledge to practice. They also have power to make the teachers circulate within the network, doing things and becoming involved. On the surface, it appears that these teachers act with agency as they engage with their professional associations, along the lines of the dichotomous structure/ agency model. However, within ANT, agency is seen as, "...a distributed agency that goes beyond the somatic resources of the individual." (Berndt and Boeckler, 2009:543). In other words, agency for ANT does not reside within individual humans but is a cause of network connections between actors, both human and non-human. Therefore, it is the ways that the different network actors link together that forces these teachers to mobilise.

The second way that teachers are brought into professional associations is through a process of socialisation. It is this second mechanism that is more prevalent in teachers' professional associations and happens in two ways. Again, as with agency, I am not using the term socialisation from a social constructionalist perspective, but from an ANT perspective. The beginnings of the socialisation process can be traced through their histories and both associations within the study have a relatively long history. The AHT was established 48 years ago and the ACPT was formed 95 years ago. Some teachers recollect their experiences of these associations from when they themselves were students and could vividly remember the experiences they had through entering competitions. A competition judge explained that his first experience of the AHT was as a student being entered into the association's hairdressing competition. This process works through boundary objects and in the descriptions given by the teachers of how they entered the AHT, the boundary objects for them were the competitions that they entered as

students. Other teachers are introduced to the associations as young teachers by their more established colleagues. Here these established teachers are acting as OPPs, in similar ways to Callon's (1986a) scallop scientists. They know the answers to issues and problems, such as how to find out about latest trends, both within education and the occupation, and how to identify the alliances around these problems in order to preserve long term interests. However, this method of being brought into the association is more easily subject to failure as the network connections can, through the use of ANT, be seen as insecure (Law 2007). For example, one teacher (D) explained how as a young, part-time teacher he was very involved in the AHT, but on moving to another college to take up a more permanent position, that particular college was not involved in the AHT and in his words, for him, "It died a death." In this particular instance, the network as it folds across time and space does not have strong network connections in all geographical locations, in this example in particular colleges.

Interestingly, the AHT also uses a coercive tactic and begins with the tangible raison d'être for the association. This was explained by the chair of the AHT as:

> *But I think the draw of the AHT, you know the reason why it has a membership, is because of the competitions that we are running. All colleges across the country sees that as an important event coz it brings everybody together.*

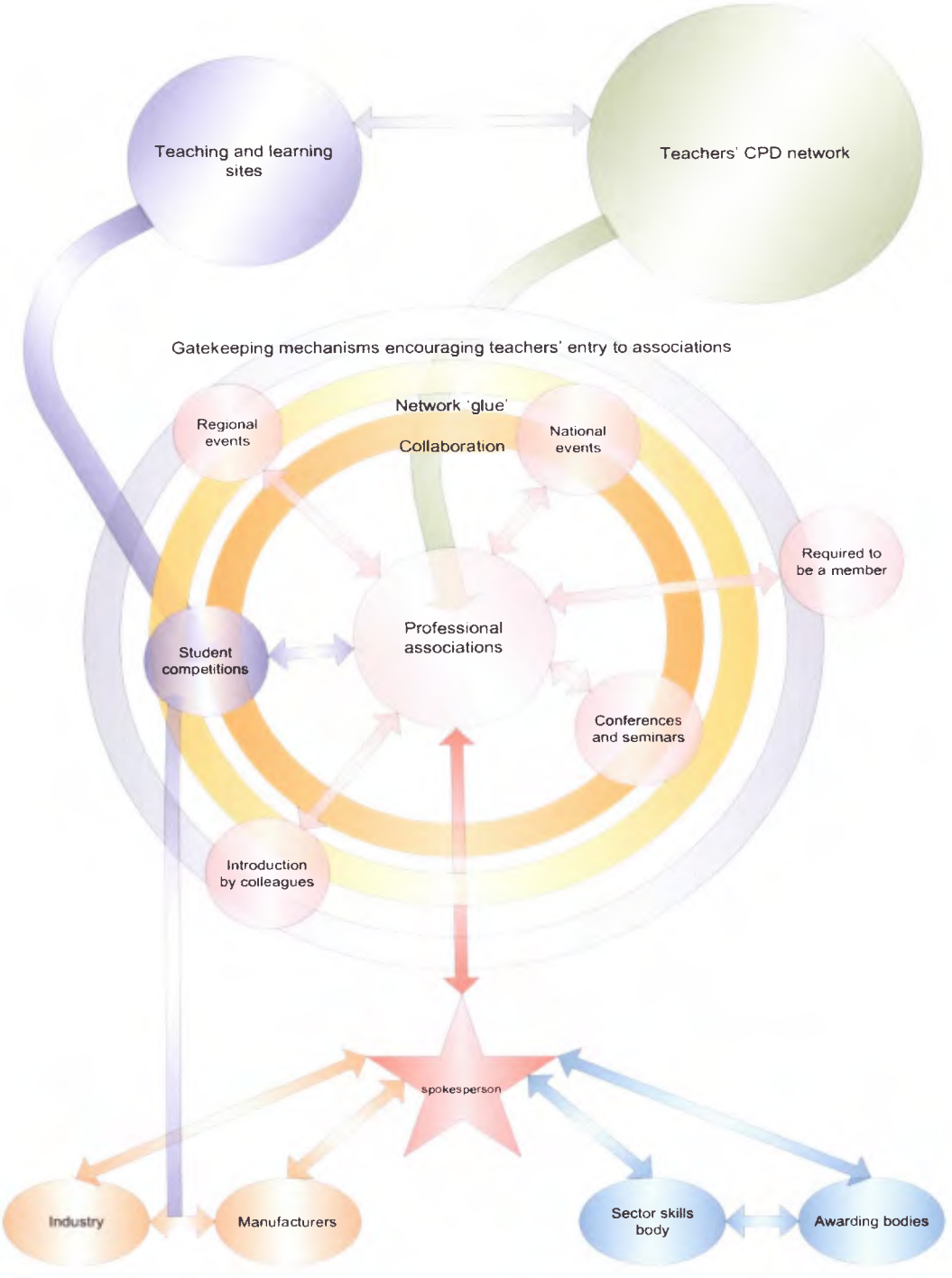
Each AHT member is allowed to enter two students into the regional competition and additional student entries require additional members. This requirement enables the power of this particular actor network, the AHT to become visible. Through the particular actor of competition entry, pressure is exerted from within the actor-network on teachers to become mobilised. The entry requirement has, in ANT terms, power to make others do things (Latour, 2007). The concept of power within ANT is different to the way the concept is

used in other approaches. Within ANT, it is seen as an attribute of the quality of network connections and not as a separate force, capacity or thing to be commanded by individuals (Jewson, 2007). Additionally, according to Fox (2000), integral to action, which is what ANT analysis attempts to observe, is force, which is the way power acts. This force is material, tangible and therefore observable. Using this analysis, we can see that the competitions have power to hold the network together by recruiting members, but it does not explain how continued circulation of professional associations is maintained.

Actor-network 'glue' as a powerful entity maintaining professional associations

Latour (2007:37) argues, that for sociologists of associations, there is no, "...big reassuring pot of glue to keep all those groups together". He adds that, "...if a dancer stops dancing, the dance is finished. No inertia will carry the show forward." What this demonstrates, is the performative nature of actor-networks in that if there is no action, then there is nothing to be observed. It is action and circulation that keeps a network together, that maintains it. By tracing the glue that holds the professional associations together, a full map of the actor-network can be built, as shown in Figure Ten below.

Figure Ten: Full map of the actor-network of professional associations



The glue that holds these professional associations together are the enjoyable social events and common to professional associations in this study were national meetings. The ACPT meet in March and October and each meeting lasts a day. In addition, they hold an AGM which is a weekend event, normally in a plush hotel. The one in the previous year included a boat trip on the local river, complete with evening meal. Similarly, in addition to the regional and national competitions and network events, the AHT holds a yearly two-day seminar weekend, based around CPD events that are held again in a plush hotel.

It is helpful in understanding this to explore the particular event of a two day AHT seminar held in a Midland's hotel. The Grand hotel is, in line with its name, quite grand with sweeping staircases and well equipped rooms. Various rooms within the hotel were used during the weekend. The most often used room was a large venue room where the key presentations and discussions took place. The participants sat at round tables that had white linen cloths and padded, comfortable chairs.

Three different dining areas were available for the participants. The evening meal on the first night was in a formal dining room, with participants at round tables, choosing where and with whom they sat. The lunch on the following day was served in the Grand Hall next to the function room. This is decorated in very late Victorian gothic style. The evening meal on the Saturday evening took place in a smaller dining room. This felt a more modern room with lower ceilings and a more intimate space.

The final area that the group used was the bar and adjoining seating area. This offered a very comfortable and informal environment and many of the participants gathered here both prior to and after the evening meals. Taking this journey a little further to describe the glue like events, the two days culminated with a meal on the Saturday evening, which was very formal in

nature. Seating was prearranged and a seating plan was set up in the entrance to the dining room. Attendees had been requested to 'dress to impress' prior to the event. Before the meal commenced, there was a toast to the Queen and this was entered into with good heart, regardless of individual positions on the monarchy and republicanism. Following on from the meal were formal speeches and the formal handover of the position of chair. This was followed by a dance in an adjoining hall. This formal evening is a regular event at the AHT seminar and much discussion went on beforehand as to what each person would be wearing.

This identifies that an aspect, or intermediary, running through the nodes of the meetings and events, is a positioning that says this is who and what we are, this is what we are about collectively as a group. It is similar to the meaning carried through a network by types of fabric as explained by Latour (2007). His fabrics are silk and nylon and these act as intermediaries when they carry a social message. The social meanings that these fabrics carry are that silk is for highbrow and nylon for low brow classes and individuals. The distinction here as to whether theses fabrics are mediators or intermediaries is that they are not changing practice, they are not influencing who is high and who is low brow. Through this and the preceding sections, we can see that a vital role of professional associations is to provide forums for teachers. Using an ANT approach of following the actor, has enabled us to see that these social events are a vital way of ensuring continued circulation for the actor-networks of professional associations, therefore existence of the group. They are the glue holding these networks together.

However, it is these very characteristics that can somehow diminish credibility and can lead to professional associations being conceptualised as being of little benefit. The business studies lecturer said of his conference that some delegates were attending purely for the "jolly." This viewpoint was a barrier for the applied sciences teacher, who finds it problematic to take time away from

his teaching to attend his events as, "In his view, [his line manager's] I'm having a jolly". The reason in ANT terms for this difference in perceptions, as described by the applied sciences teacher, is because of multiplicity. According to Law (2009), sometimes these multiple worlds dovetail together and sometimes they don't, making it much less clear what needs to be done. We can see here that these multiple worlds have not dovetailed, thus how teachers pursue CPD for subject and occupational purposes remains unclear for at least one world, that of the organisation.

This inability of one world being unable to see benefits identified by an alternate world, can also be seen in the student competitions for both teachers and their students. One AHT member (E) reflected this and stated that attendance at meetings is done in his own time and said, "We all do it in our own time, we all give up our own time to go to these meetings." These barriers and the extent to which colleges enable or disable teachers as they attempt to maintain and develop their occupational expertise is further explored in the following section.

Barriers to CPD for subject and occupational development

Teachers encounter varying types of barriers as they attempt to engage with activities to maintain and develop occupational expertise. The central issue lies within the organisational approach that does not seem to recognise occupational expertise as an integral and necessary aspect of a teacher's continued professional development. From this, teachers find themselves unable to access funding for their occupational professional development. This in turn, coupled with the ways in which their workloads have intensified means that often, they are not able to free up time to engage with activities.

Organisational perceptions and approaches

In order to access occupationally relevant CPD, teachers need to be supported by their employing organisation and eighty percent of respondents to the questionnaire stated that occupational expertise was important to their employer. However, I suggest, similarly to Foddy (1993), that the relationship between what respondents say they do and what they actually do is not always very strong. In other words, within social research, actions speak louder than words. The experiences of the teachers and their employers' actions, tell a very different story. For example, the HR conceptualisation of CPD does not seem to network and connect with that of teachers and the HR manager said:

> *I don't think the first thing is let's make sure people are working on their subject specialist.*

If a teacher was not performing as to the organisational requirements of improving student retention and achievement, the more likely response is, according to the HR manager, "where do we need to performance manage people out."

In ANT terminology, CPD for occupational purposes does not circulate into and through the employing college. Within an ANT approach, this lack of connection can be described as blank spaces (Fenwick, 2011), between the multiple networks that are being traced here through their network connections. This lack of network connections, or blank spaces, between the two worlds can be seen in the stories told about their CPD experiences by the teachers who paint a picture of organisational CPD that rarely, if ever, focuses on occupational and subject development. Through these we can see that there is often little trace within and through organisations of CPD for these purposes.

In addition to the blank spaces between the different worlds, the mediators of passion, maintaining currency, and improving teaching and learning do not traject into and through the organisational CPD world to any large extent. When they do manage to, they act as mere intermediaries, carrying meaning but leaving little impact or trace. In the words of Latour (2007:31), "...the ensemble generates no trace..." An example of this was given earlier in this chapter, whereby the teachers expressed concerns with being seen as overly passionate about their subject or occupational area. The mediator for improving teaching and learning has also not worked within the organisational CPD network in the same way as within the teacher CPD network and within the organisational CPD actor-network world has become merely an intermediary. Through its work as an intermediary, it has carried a different message thorough the organisational network as explained by the HR manager who said:

> *...but I don't see improving someone's subject knowledge is the first thought that comes into your head if you have got concerns about success rates and retention.*

Both the blank spaces between networks, and the teacher CPD network mediators, acting at best as intermediaries within the organisational CPD network, can be traced through the lack of resources in terms of both funding and time, which do not appear to be mobilised for CPD for occupational purposes.

Funding for subject and occupational professional development

Finding the funding to engage in CPD was a common concern for those teachers interviewed, as it was for those in the questionnaire survey. Unsurprisingly, teachers on other than full-time contracts, those on less secure contracts, found it more problematic to secure funding. This also normally manifested in being

unable to secure time and raises issues of equity. For some teachers, funding for occupational CPD was nonexistent. A typical response was given by the teacher of students with learning disabilities who said that in his college, there is, "Zero CPD for anyone in any academy." Similarly, the construction teacher explained that all CPD activities for the purposes of maintaining and developing his knowledge of carpentry and joinery is, "Completely up to me." and that anything that he is interested in such as exhibitions or courses are self-funded. The applied sciences teacher explained that none of the activities carried out that linked to his occupation were funded by his employing college. The early years teacher faced similar funding issues and said, "I've never got anything, I pay everything." However, that fact that she is an hourly paid, part-time teacher offers her an advantage over her colleagues on more secure and substantial contracts. Whilst her college does not fund this form of CPD for her, in the time when she is not employed by the college, she works as a consultant. The advantage that she has is that through this, she can claim expenses and fees for CPD activities as a non-taxable expense. Perhaps there is a wider lesson to be learnt here. If teachers have to fund their own CPD, it may be that it should attract more favourable taxation arrangements.

The most common impact of not being able to secure funding is that this inhibits teachers from accessing courses and other events outside of the organisation. In other words it inhibits teachers from accessing obligatory points of passage (OPPs) (Callon, 1986b), that enable teachers to funnel new subject and occupational knowledge from their occupational area. An example of the impact of lack of funding was given by the teacher of students with learning disabilities who explained how he submitted a request for support to enable him to engage with an Open University course on inclusion and diversity. He stated that this request had not been passed to the appropriate department by his departmental manager. He explained that this was due to the severe restrictions on funding for CPD. Similarly, the hairdressing teacher (A) also

explained that currently there is no funding available for her to attend outside events.

Earlier in this chapter, I explored how powerful professional associations are for offering teachers access to CPD events. However, membership fees are normally paid by the individual teacher, rather than the employing college. These fees vary according to the organisation and the number of organisations that the teacher subscribes to. For example, the cost of belonging to the AHT for the hairdressing teacher (A) is relatively cheap at £40, whereas the applied sciences teacher is a member of more than one association and the personal cost to him is in the region of £500. This again raises issues of equity and equal access. If these organisations are, as I suggest, so powerful in helping teachers to develop and maintain subject and occupational expertise, then it is far too important to rely on whether the individual teacher is personally positioned to be willing and able to self fund. On occasion, colleges do recognise the importance of supporting teachers in accessing professional associations and pay the membership fee. For example, previously I explained how the business studies teacher is required by the CIPD to be a member if the college is providing their accredited courses. He describes himself as "lucky" in that his manager ensures that his fees are met by the college. However, it is not the mediators for teachers' subject and occupational CPD that are driving this decision to fund, rather it is that to offer the courses, this requirement must be met.

This demonstrates that bodies outside teaching colleges can have power to help teachers build bridges from teaching to the occupation through the development of boundary objects and OPPs. Remembering here that power for ANT comes through the process of agencement, through the power of associations (Munro, 2009). We can identify here that the business studies teacher's professional association, because of its associations, its nodes where many actors and entities come together, has power. Nodes are smaller

groupings of entities within an actor-network where different negotiations take place (Fenwick, 2010b). However, just because a node has been created does not mean that it has power. As I noted earlier in this thesis, hairdressing teachers are required to carry out 30 hours of occupationally related CPD per year by their Sector Skills Body. The applied science teacher is subject to a similar requirement, but in his case, by his professional association. However, unlike the experiences of the business studies teacher, described above, the requirements for the hairdressing and applied science teachers do not seem to have traversed into the organisational CPD network. The node of the requirement for engaging with CPD should be especially strong for the hairdressing teachers, as their requiring organisation is the one that sets the standards for the qualifications that they teach. It should therefore have power. It does not and in ANT terminology, it does not have power because it has not built strong network connections into and through the organisational CPD network.

Emerging from the above is that, as funding is not often provided for many teachers, they fund their own occupationally relevant CPD. For example, the construction teacher explained how he recently attended a one week course on chair-making. This course was self-funded and he attended it by taking his annual leave. He also paid for his own accommodation and travel expenses. He recognised that he is in a fortunate position, in that he was able to do this, but recognised that his colleagues may have different personal circumstances, which would mean that they were not able to do this. This opens up another potential mechanism for inequity and unequal access to CPD. Emergent here is that the mediators working within the teacher CPD actor-network are so powerful that they drive some teachers to overcome this barrier of lack of funding, in pursuit of their subject and occupational development. These mediators make other actors, the teachers, within the network do things (Latour, 2007). However, power within ANT is through ongoing work that

sustains its connections and enactments (Fenwick and Edwards, 2011), and where this does not happen, it is likely due to competing actor-networks of personal circumstances that disrupt the teacher CPD network connections. These competing actor-networks mean that teachers are not able to identify spare personal finance to support their occupational development.

The impact of lack of funds on securing time

Not only does funding impact on teachers being able to pay for activities, it also impacts on teachers' ability to secure the time to attend activities. Members of the AHT stated that attendance at meetings is done in their own time and one (E) said:

> *We all do it in our own time, we all give up our own time to go to these meetings, like this week I'm going up to Blackpool, I come from the furthest, you know, it's like a five hour drive in my own time, but I do it to support the AHT and the southern area.*

To a large extent, this works as the AHT meetings are organised on weekends and evenings, when teachers are not being contracted to teach. This becomes an issue when attendance at events and courses are scheduled for when teachers are contractually obliged to be in classrooms with students and can become a barrier to active membership of professional associations This was highlighted by the APCT chair who explained that current trends towards increased workloads within colleges impacts negatively on teachers. He said:

> *The colleges make such demands on staff today that they don't have that time and colleges don't release staff as they did years ago.*

One way in which teachers use funding is to 'buy' time for CPD so that another teacher would be paid to cover classes whilst the original teacher attends an

event. The graphic design teacher linked time to funding in this way. He stated that one of the reasons why there was such little time and space for CPD was that funding could not be accessed to release him to attend events. The lack of ability for teachers to buy time is even more detrimental when teachers are not employed on full-time contracts. Whilst being employed part-time may offer them more space to pursue CPD activities, when there is a clash, it can cause greater issues for them. A hairdressing teacher (A) explained how, because she is hourly paid for part of her contract, she has suffered financial loss in taking students to competitions. When she has taken students to the competitions, other colleagues need to cover her classes. The problem is that these colleagues are then paid instead of the teacher accompanying the students, but she does not receive pay for taking the students to the competitions and is expected to do this on a voluntary basis. She is therefore experiencing a 'double whammy' of losing pay for the classes she should be teaching, and not been paid for the time it takes to attend the competitions. The same hairdressing teacher also explained that for the last two years, she has no longer been able to take students to the AHT competitions as the college will no longer provide the money for student travel, accommodation and subsistence for competitions.

This has an impact on this teacher's ability to develop her skills and knowledge as she used the opportunities presented by the competitions to network with hairdressing teachers from other colleges and this no longer happens for her. Not only does the lack of funding for subject and occupational development impact on teachers, it also impoverishes the students' learning experiences. One of the strengths of professional associations is that they can enable and facilitate high levels of collaborative learning that cross boundaries between teachers and students and both groups learn together, albeit in different ways.

What the teachers sometimes do when time cannot be bought is to, in the words of the applied sciences teacher, "horse trade" and swap classes to free

up time. What this essential means though is that to engage in any activity, the teacher is required to make up the time that is being 'lost' to the college. The applied science teacher explained how, when he requested time to attend a professional association set of meetings, he was told that he could attend but was informed by his line manager that, "You've got to arrange cover for all your classes while you are away." The way he dealt with this was to call in favours from colleagues and swap classes with them. This brings its own work as some of these swaps will be in areas that are unfamiliar to the teacher, necessitating extra time being spent on lesson preparation.

What the applied sciences teacher called "Horse trading" hours by swapping classes is becoming more difficult for teachers as they face increased and intensified workloads. Research shows that teachers' workloads have been intensified. Ballet *et al* (2006), found that work intensification in the case of school teachers included; less 'down time' in the working day, resulting in less time to keep up with developments in subject areas and less time to reflect on and refine teaching; a chronic and persistent sense of work overload which in turn fosters dependency on externally produced materials; negative effects on quality as corners are cut to save time and; diversification of expertise creating doubts about own competence. Supporting these observations with accounts from FE, Edward et al (2007), report that teachers and managers in colleges, described coping with endless change coming at them from all directions and struggling to balance the needs of their learners, with the demands from their managers, inspectors and funding sources. Against this backdrop, it is problematic to envisage how these teachers will be able to find space to engage with CPD in meaningful ways. Indeed, the graphics teacher stated that the greatest barrier to engaging with CPD was time and pressure from other jobs that were required, such as tracking students and administering assessment processes. He said it, "Just consumes it all" and described educational administration as, "The biggest block to doing anything else."

Enabling or disabling line management approaches to CPD

Emerging from the above, is that managers in FE colleges have power to either enable or disable teachers as they attempt to engage with CPD activities for subject or occupational purposes. They are positioned to enable this because of the elasticity of the role of the manager that affords extensive agency and autonomy (Page, 2011). For example, teachers described themselves as, "lucky" if their manager found ways to support their requests for time or funding for CPD and were thus enabled in their activities. Alternatively, the teacher of students with learning disabilities described how he sent requests, "up the line" only to have them ignored, thus he was disabled in his CPD activities. Arguably, these managers can be identified as the neck in the hourglass of CPD, allowing or not, and regulating the flow of the grains of CPD for their staff. In ANT terms, they mediate teachers' engagement with CPD through positioning themselves as OPPs between the teachers and the actors of funding and time allocation within the organisational actor-network. Callon, in exploring the development of an electric car by EDF (1986b), and the work of the researchers with the St Brieuc Bay scallop fishermen (Callon, 1986a), explains that OPPs position themselves as something that must be passed through to secure support and resources. However, here I am not arguing that these managers position themselves deliberately in this way. Rather they are positioned by the work of the network connections to other actors and entities within the organisational CPD actor-network.

The work of managers as potential OPPs can also be seen in the socialisation process described in the previous section, whereby new teachers are brought into professional associations by the old timers (Lave and Wenger, 1991). These established teachers are often the curriculum managers in charge of the hairdressing department and one of the AHT teachers (E), who was also a manager, described this process and the level of power he had over bringing these teachers into the association. He said:

When I became manager of the department, I didn't have to ask anybody, I just paid for all staff members to be part of the AHT.

From this, we can also indentify that managers can also operate as gatekeepers to the professional associations for both teachers and their students.

The extent to which managers are able to work effectively as OPPs is determined by how they themselves are positioned by the actor-networks in which they operate and the pressures that other entities impose. Probably, the most enabling line management structure is one that enables collaborative working. The graphic design teacher used the collective language of "we" when talking about how CPD was organised. He explained that "we" take the view of trying to accommodate each other in attending external lectures and that this will be supported by the line manager if it is a valid activity. However, this teacher does not work in main-stream FE, but in a specialist college, and the organisational structures and approach may well be different to that in FE. This suggests that for this teacher, the college is managed along collegiate lines within the traditional professional paradigm (Randle and Brady, 1997a). In some FE colleges, there are examples of where mangers are supportive of their staff in their subject and occupational development and who still operate their departments as much as they can along these collegiate lines. The business studies teacher explained that he felt himself to be "lucky" in that his manager is supportive and will try and identify funding to enable him to engage in identified activities. This is because he says, "My manager pretty much understands...she knows quite a lot about HR..." For this teacher, the level of support extended to having a masters course fees being met. It did not however, extend to finding time to release the teacher. One of the problems identifiable here is that this manager is not only acting as an OPP, working to funnel CPD opportunities to the teacher, she also finds herself situated within a, "...complex and contradictory role...as a mediator of change." (Gleeson and Shain, 1999:461). These managers may also be strategically complying with

their organisation in their attempts to facilitate teachers. An example of how they do this was given by the same hairdressing department manager who was also an AHT member (E). He explained that if he was questioned on funding AHT activities and membership for his staff, he would explain it away as being enrichment for the students. Here, as he strategically complies, he is displaying, "...a form of artful pragmatism which reconciles professional and managerial interests." (ibid, 1999:482).

For some teachers, their managers are themselves under pressure, running fairly large departments that cross multiple sites. This impacts on the relationship he or she can build with their team, which in turn may impact on how magnanimous they can be in terms of the decisions they make for CPD. The teacher of students with learning disabilities explained this very thing and that his line manager covered three sites and probably only spent one and a half days on the site where the learning disabilities team is located. The impact of this was that they were very much left to their own devices and were offered little support over issues, concerns and problems. Coupled with this, the line manager was not a learning disabilities expert and therefore, as explained by the teacher of students with learning disabilities, did not understand the issues and concerns. Resulting from this is that this teacher felt that the college had no concerns for his professional development in his subject area. This managerial distance from occupational knowledge as being part of the disabling process appears to be a common theme. The applied sciences teacher explained that his particular manager did not like him attending meetings of his professional association. When asked to explain why this might be, he stated that his line manager is not an expert in the field. At work here is that in both these examples, the managers themselves did not have strong network connections to the subject or occupational areas. Therefore, two of the three mediators, those of passion and currency, are not circulating through to force enactment in favour of CPD activities. These managers may be willing

compliers who are consciously aligning themselves with the corporate aims of their college, or unwilling compliers who themselves do not feel supported by their managers (Gleeson and Shain, 1999).

The three mediators of passion, currency and impact on teaching and learning, however, can be seen to work in influencing the practice of some managers. This occurs when these managers are closer to the subject or occupational area and therefore have more and stronger network connections to the occupational area. This can be seen in the example given by the construction teacher, which also shows that even when the immediate line manager is supportive, they in turn may be stymied by the organisational culture. He explained how his manager is, "A top guy" and that, "You think I'm passionate about my job, this guy is even more so, he's really into it." But this construction teacher still described the organisational approach to CPD as, "It ticks a box." When I asked him whether the CPD provided to him was effective, his response was, "No, but managers don't care." These managers are having to attempt to accommodate teachers' professional development, whilst at the same time, dealing with "...complex moral and ethical decisions...often bounded by severe financial constraints." (Gleeson and Shain, 1999:470). It demonstrates the complex and contradictory position held by many managers within FE in that even when managers are working to support teachers as best as they can to secure funding and time, they are seen to be inhibiting access by the very same teachers.

The impact of barriers on teachers' engagement with CPD

I have identified here how the multiple worlds of organisational CPD and teacher CPD can work in effect, against each other. This is because, often, there are different drivers or mediators working within each of these identified realities. The mediators driving teachers' CPD do not always cross the organisational boundary. What this can then produce are barriers of funding,

time and lack of line management support. What this in turn means is that for many teachers, their pursuit of CPD for occupational purposes is impoverished as they work within small and constrained actor-networks. For some, this inhibits them from operating outside of the organisation and as described in the previous section, they become siloised within their employing organisation, only able to learn collaboratively from their immediate colleagues. Whilst this is of benefit, their inability to circulate to and through wider networks means that their professional development is somewhat inhibited and impoverished.

Summary

Using a range of actor-network theory analytical tools has enabled the three mediators or drivers for teachers' CPD for the purposes of subject and occupational development to emerge. These are: a) passion for subject or original occupation; b) maintaining currency; and c) improving teaching and learning. By tracing the network effects of these, how teachers act with power and agency in identifying and pursuing activities has become evident. Teachers engage in a wide number of activities, driven by these three mediators. At all times, the purpose of these is to enable teachers to link back to their original professions and occupations. Some of these are done in highly individualised ways, such as reading specialist materials and engaging with specialist websites. By far the most powerful and effective mechanism for some teachers are professional associations. These have, in ANT terminology, high levels of circulation and enable teachers to network and collaborate with many other networks. These include the original industry, manufacturers, teachers from other colleges, awarding bodies and sector skills bodies, and students. At the heart of these associations are two distinct activities. First, student competitions enable high levels of circulation and sharing of practice and it is through this that the third mediator, that of improving teaching and learning

can be traced. Second, the more social events that act as actor-network 'glue' ensure that the professional associations continue. However, it is in part this second activity that can produce barriers for teachers as these activities can then be seen by some as being a "jolly". Through the use of the ANT concept of multiple worlds, both the conflicting nature of these, and the mechanisms of boundary objects and OPPs that teachers use to traverse worlds, and to funnel information, knowledge and skills, emerge. In the final section, I have used the concept of multiple worlds to explore ways in which teachers may be inhibited by organisational constraints from engaging with the rich actor-networks mapped.

Chapter Seven: Conclusions and recommendations

Introduction

This study set out to identify the ways in which vocational teachers in FE colleges maintain and develop their occupational expertise and pedagogical practices. The maintenance of occupational expertise is important to teachers and most of their CPD time is spent on this. Three reasons were identified. Firstly, teachers are passionate about their occupational area. Secondly, teachers themselves identify the importance of keeping up-to-date with current trends within the occupational area. Thirdly, teachers believe that CPD enhances their pedagogic practice. However, it is through an examination of what teachers actually do that sheds light on the complex nature of CPD activities for subject and occupational development. As teachers are individually situated within their own particular context, the paths they follow, the networks they become part of, and activities they engage with, are individually different. Using Actor-Network Theory as an analytical tool has enabled a map of the multiple network relations to be built. However, it is this very complexity, both within the heterogeneous nature of teachers' CPD and the complexity of the sector that the barriers that many teachers face, develop. Through this, it is clear that the historical problems that have bedevilled FE teachers' CPD can still be seen.

The importance for teachers of maintaining and developing their occupational expertise and pedagogic practice

This section offers conclusions in relation to the first two research questions:

a) To what extent is the maintenance and development of occupational expertise important to vocational teachers and if so, why?
b) To what extent do vocational teachers believe that continued development of their occupational expertise impacts positively on their pedagogic practice?

Regardless of subject or occupational area taught, teachers say that maintaining and developing their occupational expertise is important and occupational development also takes up the majority of their CPD time. Through ANT, the mediators, or drivers, for CPD become clear. Perhaps one significant way in which the mediators identified here are so powerful is that they are reflective of the dual identity of vocational teachers. The first of these three powerful drivers, passion, emerges in the ways that teachers are enthusiastic about their occupational area. They want to know more about it and what the latest trends are. They themselves recognised this passion and talked at length about the passion that they had for their subjects and occupational areas. It was also evident in the ways in which they went about learning more about their occupational areas, the amount of effort expended and the deep thinking that went into what they did. What is deeply problematic is whether this can be sustained over time, if they are not supported and encouraged. I maintain that means and ways of supporting teachers in developing their specialist expertise is vital, as according to the teachers themselves, it does improve teaching and learning. Perhaps most problematically, teachers suggest that they hide their passion from their employing organisation, as they do not want to appear too passionate about what it is that they are teaching. From this emerge significant differences between conceptualisations that teachers and their organisations

have of the importance of specialist vocational knowledge. However, what is not clear is the range of reasons why teachers feel the need to disguise this and requires further exploration.

The second mediator or driver, that of maintaining currency or keeping up-to-date with the occupational area, is partly to do with maintaining credibility both in the vocational classrooms, workshops and sites, and with colleagues. Practical occupations do not stand still and new techniques and technology are constantly being introduced and used. Teachers are mindful of this and acutely aware that they need to maintain their expertise. They need to ensure that they are credible in the eyes of their students. It would be very easy become out-of-date and students, especially those that are working in the occupation as either apprentices or on work-placement, would identify this and perhaps challenge the teachers on it. Using ANT, the temporal nature of professional knowledge and skills becomes apparent and that their maintenance is dependent on high levels of circulation. It is therefore not sufficient for colleges to employ vocational teachers with high levels of occupational skills and to then neglect to support teachers in maintaining this.

The third and final mediator for occupational expertise is the development of pedagogic practice and it is clear that teachers see that maintaining and developing occupational expertise makes them better teachers. The ways in which the three drivers interrelate is that if teachers are positive and enthusiastic about their subject, in other words are passionate about it, this is transferred to their students. This happens through materials and ideas, in ANT terminology inscription devices, that can be brought into the classroom as teaching aids and additional materials in order to help the subject come alive for students. It also happens as the teachers work to funnel and act as a bridge between the classroom and the occupational area. Through these three interrelated drivers for CPD, teachers act as conduits between the two sites and help to bring students into the occupation they are being trained for. It also

highlights the interrelationship between teacher learning and student learning and that this can be rich and beneficial to both, if carried out in collaboration.

For teachers and their students, this linking of the classroom to the wider industry is of significant importance. The development of occupational expertise is a network effect. Much workplace learning theory focuses on the contextual nature of effective learning and it is this contextualisation that teachers attempt to connect to through their occupational development activities. Teachers themselves unconsciously and tacitly recognise this and position themselves as obligatory passage points in order to fold time and space, both geographically and metaphorically. This is so that both they and their students can access new knowledge and skills, and that their students are also trained and enculturated into what is needed and required for the occupational workplace above and beyond instrumental and practical skills. This in turn sheds light on the nature of vocational knowledge which is both contextual, subject to constant change and using ANT analyses, a network effect.

The networked activities teachers engage with to develop occupational expertise

This section offers conclusions in relation to three of the research questions:

c) What activities do vocational teachers engage with to develop occupational expertise?
d) What organisations, bodies, companies, individuals or other institutions do teachers engage with whilst carrying out these activities?
e) Where are the learning sites at which these activities take place?

Teachers themselves act with agency in their engagement with a wide range of activities for subject and occupational development. However, the form of agency here is not the dichotomous structure/agency, rather it is a distributed and networked agency (Hamilton, 2010), that forges action through the interrelations of all actors, both human and non-human within the networks that teachers inhabit.

It is through explorations of the ways in which teachers maintain and develop their occupational expertise, that complexity becomes visible. This is encapsulated in the bridging between the occupation and the learning site and was evident in much of what teachers did to develop their occupational skills and knowledge. This bridging or funneling of occupational expertise ranged from individual pursuits, such as reading specialist journals and periodicals, to small-scale collaboration within teaching teams, through to quite sophisticated, collaborative adventures that crossed organisational boundaries and included teachers, students and industry. Written specialist materials were used when teachers were working within impoverished teaching and learning environments, where they could not directly access outside collaborative events. They were also used as additional and supplementary activities to collaborative events. Situated along the continuum of poor to high quality CPD activities lie collaborative activities that take place within teaching teams. Here, teachers worked together and brought students and representatives, or spokespersons from industry, into the collaborative learning activities. However, concerns are raised around this type of professional learning in that these activities, by their very nature of not effectively crossing organisational boundaries, can be siloised (Christensen *et al.*, 2010), and the teachers 'balkanised' (Hargreaves, 1991). Thus, these activities are limited in their benefits to teachers in that they do not enable teachers to properly link to, and engage with, the distant sites of the occupation.

By far the most beneficial forms of professional development, for the purposes of occupational expertise development, are those that take place through professional associations. These enable teachers to bridge three worlds of teachers, students and occupation. They enable teachers to collaborate together and to share practice. They offer a forum where teachers can more easily access spokespersons from the original industry. They also involve students through competitions, thus aiding their development and learning within the particular occupational area. What emerges here is a complex set of relations, network nodes and networks, which teachers can engage with in a variety of ways. However, even though these professional associations are vehicles for affording rich opportunities to both teachers and students, ANT approaches to understanding activity as continuous circulation within and through networks, shows that this is not sufficient to maintain the network. They are held together by 'actor-network glue' of social events which, on occasion, undermines them. Nevertheless, they offer unique places and opportunities that enable teachers to develop occupational expertise.

Complexity and heterogeneity: Doing it for themselves

This section offers conclusions to the final two research questions:

f) To what extent do the vocational teachers' employers (the colleges) support their CPD activities?
g) To what extent are activities for teachers heterogeneously different to those of other teachers?

Teachers do indeed 'do it for themselves', when it comes to maintaining and developing their occupational expertise. The historical context described in Chapter Two, showed that teachers' professional development is often neglected by policy makers and funders. There are three persistent problems

for why it is neglected: a) the low esteem of vocational subjects and areas which is reflected in CPD provision; b) the over simplification of how teacher professional learning is contextualised and situated and; c) the ways in which the provision of funding has moved from central government and LEAs to individual colleges. This is compounded by the lack of importance that colleges also place on the development of occupational expertise. In part, the impoverishment of vocational teachers' professional development is due to the complexity and heterogeneity that emerges from the nature of the FE sector, described in Chapters One and Two. The different journeys that teachers take are predicated on the occupational area they teach, their personal circumstances, contractual arrangements within the sector, the opportunities available to them and the organisational barriers they potentially face. The mediators identified here will work for individual teachers in different ways. For example, for the carpentry teacher, traditional approaches are still used in high quality work and, therefore, he needs to link back to the masters of old. Within many of the occupational areas, there is a high level of currency that drives activity.

Arguably, it is this complexity and heterogeneity that is at the heart of barriers that teachers face in developing their occupational expertise. This is coupled with a lack of conceptual understanding of the nature of vocational knowledge. It appears that, in terms of teachers' CPD, knowledge is seen as something that can be codified and transferred from one location to another unproblematically. However, the ANT analysis here has opened the debate in order that it is seen as a network effect, rather than a codified product. Within this, it becomes clear that not all forms of knowledge can be easily seen, identified and codified. Thus, it is highly problematic to envisage it as something that can be easily packaged and transferred across contexts. ANT has allowed us to see that professional vocational knowledge is developed through a web of relations and interactions that are not context free and are

determined by mediators working within the network to exert power onto teachers as actors within this wide web of relations. The complexity and heterogeneity within this means that teachers will each follow a different trajectory back to their original occupation as they attempt to maintain their occupational expertise.

The heterogeneous nature of teachers' CPD for occupational purposes means that it is highly problematic for teachers to secure resources with which they can free up time and space. This becomes more problematic for those teachers, as was the case for more than half of the teachers in this study, who are not employed on a full-time, permanent contract. However, these barriers can be, and are, negated in some instances for some teachers. For some, their line manager is able to identify and create spaces to enable teachers' to engage in CPD activities. However, it seems that those that do this are the ones that are closer themselves to the occupational area of the individual teacher. The other way, again predicated on the closeness to the occupational area, was in the experiences of the graphic design teacher who was employed in a relatively small specialist arts college. Both these circumstances enabled trajectories to be opened up more easily to the networks that teachers could use to access occupational knowledge.

The problem here lies in the ever more complex nature of general FE colleges, which are currently merging to create ever larger super colleges. This may actually worsen the already impoverished nature of many teachers' CPD opportunities for occupational development purposes.

Summary

This exploration of how vocational teachers in FE colleges, in England, maintain and develop their occupational expertise, and pedagogical practices makes a

valuable contribution to understanding how teachers, in 'doing it for themselves', go about planning and engaging with CPD. It has shed light on both the drivers for, and activities teachers engage with, for these purposes. It has shown that in line with work on school teachers' professional development, the richest and most beneficial are the collaborative opportunities that enable boundary crossing. This is because this collaborative boundary crossing enables teachers to link between the occupational and teaching sites and therefore for vocational teachers, enables them to bring current vocational knowledge back to learning sites to share with their students. I suggest however, that occupational development is so important to these teachers that they engage with a wide variety of additional activities, therefore, engagement is both multiplicitous and heterogeneous. They do this regardless of legislative requirements or support offered by their employing college. The historical context presented in Chapter Two, demonstrates that policy interest in vocational teachers and their professional development has never been maintained. I would argue that in spite of any external interference that vocational teachers will continue to 'do it for themselves'. Nevertheless, this does not negate colleges' responsibilities to both their teachers and the students they teach, to support them as much as practicable in maintaining and developing occupational expertise. In light of this the following recommendations are made.

Recommendations

1. Teachers believe that maintaining and developing occupational expertise improves pedagogic practice and this is supported by this study. However, the explicit ways in which it does so requires further investigation

2. Through the use of ANT analyses, this study has begun to offer different ways of understanding vocational knowledge and professional learning in that it can be conceptualised as a network effect. This offers fertile ground for further exploration and investigation
3. The findings suggest that teachers situated within smaller specialist teaching colleges, such as the graphic design teacher in the specialist arts college, have greater opportunity to develop occupational expertise. This is deeply problematic in the current climate of college mergers, which may result in colleges becoming too large to fully support a wide and diverse body of teachers. What may instead be required, are smaller more specialised colleges. This will enable a stronger and clearer focus on the development of high quality provision, whereby vocational education and training is seen as the central purpose of the organisation
4. Managers who are closer to the occupational specialism of teachers are better placed to support occupational development. There may be benefit in organising college teaching departments into smaller sections in order that managers are also specialists in the original occupation. In this way, they may be better placed to enable teachers to identify spaces for occupational development
5. Organisations should also consider prioritising funds for occupational development activities. Rather than generic CPD provision, ways in which teachers can be supported to develop occupational expertise should be identified, both within and beyond the employing organisation
6. Those teachers on less secure contracts are offered less support from colleges in terms of both funding and being released to attend events, than permanent full-time teachers. This lack of equity requires addressing in order that teachers are treated equitably and therefore, all students receive the same quality of vocational teaching

7. Because much of the activity is self-funded and carried out in the teacher's own time, engagement is largely determined by the individual teacher's personal circumstances. It is predicated on whether they can afford to do this and this again leads to a lack of equity. If teachers are funding their own CPD, then perhaps more favourable tax arrangements could be made and it can be claimed as a taxable expense

Evaluation

One of the main strengths of the research presented here is that it is grounded in the professional experiences of teachers. It has made visible some of the activities that teachers carry out, post initial qualification, to maintain and develop their occupational expertise. Through this, it has shed light on the issues raised by treating teachers' CPD as simple and unproblematic. This then suggests that teachers need space, time and support in order to improve practice and thus teaching and learning.

However, as this study is grounded in the experiences of teachers and an ethnographic approach of 'following the actor' was used, I am not claiming that the findings are representative of teachers in the wider sector, or teachers from all occupational areas taught in FE. It was not the purpose of this study to use a representative sample, but rather to study in depth what some teachers do, in practical terms, to maintain and develop their occupational expertise. Whilst the findings cannot be said to be generalisable, they do provide a basis for debate and further research from which ideas can be developed to support vocational teachers as they maintain and expand their occupational expertise as well as the CPD needs of FE teachers more generally.

On a more personal professional level, I have benefitted from being able to present some of the research through conference (Broad, 2012b) and through

beginning to publish (Broad, 2012a). Exposure to debate through these mechanisms has aided my thinking and no doubt, it has improved my own practice as a teacher educator for the FE sector.

Through the explorations of theories of vocational knowledge, I have begun to identify and define what it is and how it is different from more traditional forms of understanding knowledge. I feel that I have only begun the journey of understanding here and my future aim is to explore this more fully through both theoretical understanding and further empirical work.

I also plan to explore teachers' professional development for occupational reasons further in three ways. Firstly, through my contact with the AHT, I met and talked to teachers from both Scotland and Wales. In Wales in particular, a very different approach is taken to the development of occupational expertise. Unfortunately there was not enough space to fully explore this, or indeed report on it in this thesis. Secondly, I have also begun to map the ways in which the organisation of HR and staff development departments impact upon and shape the CPD offer from colleges. Again there was not the space to develop this here and is an area worth pursuing further. Finally, whist the initial respondents were drawn from across the South East of England and the observations took me across England, I am aware that what is presented here may in part be a London centric view as for some of my teachers here, their CPD was made up of visiting London galleries and museums. I would like to further develop the work in order to capture more fully the views of teachers from across England.

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Appendices

Appendix One: Initial e-mail sent with questionnaire

Dear colleague,

I am contacting you as I would like to know about how you maintain and develop your subject specific expertise. The information you provide is being collected as part of my research for my Doctorate in Education thesis at the Institute of Education, University of London. My research aims to help inform approaches to the development of subject specialist expertise.

Taking part in the process

I hope that you will agree to take part in the process by completing the following questionnaire. It should take no more than five minutes to complete. However, you don't have to take part in this study if you don't want to. If you decide to not take part, please ignore this e-mail.

If you agree to take part in the process, please complete this on-line questionnaire as honestly as you can by Friday 21st October, 2011. Please skip any questions that you feel you cannot, or do not wish to answer.

There is more information about the survey, follow-up research, anonymity and what will be done with the data on completion of the study, on the front page of the questionnaire.

Here is a link to the survey:

https://www.surveymonkey.com/s.aspx?sm=J7gl_2bL4F5wNKX84X6_2bWGXydg_2be0LvNhs5kD9HRfEtRM_3d

This link is uniquely tied to this survey and your email address. Please do not forward this message. However, if you know of a colleague who would be willing to complete the questionnaire, please e-mail me for an alternative link.

Thank you for your participation,

Janet Broad

Please note: If you do not wish to receive further emails from me, please click the link below, and you will be automatically removed from the mailing list.

https://www.surveymonkey.com/optout.aspx

Appendix Two: Questionnaire

An investigation into developing subject specific expertise

About the project

Dear collegue,

I am contacting you as I would like to find out about how you maintain and develop your **subject specific expertise**. The information you provide is being collected as part of my research for my Doctorate in Education thesis at the Institute of Education, University of London. My research aims to help to inform approaches to the development of subject specialist expertise.

Taking part in the process

I hope that you will agree to take part in this study by completing this questionnaire. It should take no more than 5 minutes to complete. However, you do not have to take part if you don't wish to. If you decide not to take part, please ignore this e-mail.

If you agree to take part in the process, please complete this on-line questionnaire as honestly as you can. Please skip any questions that you feel you cannot, or do not want to, answer.

I will also be conducting some follow-up interviews with a small number of respondents. If you would be willing to be interviewed, would you indicate this in the final section of the questionnaire by giving your contact details. By indicating your willingness to be interviewed, it does not necessarily mean that you will be, as the interveiw sample will be very small.

Anonymity

All responses to the questionnaire and follow-up interviews will be kept anonymous. As the researcher on this project, I will be the only person who has access to comments and responses. these will not be shared with others. Only general themes emerging from the whole data set will be diseminated.

What happens to the records and documents after the end of the study?

The responses to the questionnaire and interviews will be kept until the final report has been produced. At this point all records will be deleted from the on-line questionnaire server and interview notes will be destroyed.

If you have any questions or comments about this project, please contact Janet Broad j.broad@ioe.ac.uk

2. About you

This section asks for information about you and the organisation(s) in which you work

1. Are you?

- Male
- Female

2. How long ago did you gain your teaching qualification?

- Not yet completed or less than two years
- 2-3 years ago
- 4-5 years ago
- More than 5 years ago

3. Do you still work in the Lifelong Learning Sector? If you answer NO, you may ignore the remaining questions

- Yes
- No

4. Would you please state your current job role

- Lecturer
- Course manager
- Departmental head
- Senior manager
- Other*

*Other (please specify)

2 About you continued...

5. What best describes your employment contract?

- ○ Full-time permanent
- ○ Fractional, permanant
- ○ Temporary contract (either full-time or fractional)
- ○ Part-time hourly paid
- ○ Other*

*Other (please specify)

6. Is your main teaching organisation predominantly?

- ○ FE college
- ○ Sixth form college
- ○ Work-based learning
- ○ Adult and community
- ○ Prison education
- ○ Private provider*
- ○ Other*

*Other or private provider, please explain

3 Your subject specialism

This section explores your subject specialism

7. Please state what you see as your subject specialism

8. Do you teach your subject specialism?

- Yes, all of the time
- Yes, most of the time
- Yes, some of the time
- No, I teach other subjects

9. If you teach subjects other than your main subject specialism, could you state what these are, using the space below

4 Developing subject specific expertise

This section explores the ways in which you maintain and further develop your subject specific expertise

10. How important is it to you to maintain and develop subject specific expertise?

- Very important
- Important
- Not very important
- Not important at all

11. From your own perspective, how important is it to your employer that you maintain and develop subject specific expertise?

- Very important
- Important
- Not very important
- Not important at all

12. Teachers in the LLS are required to engage with CPD. Could you indicate how many hours of CPD you generally carry out each year

13. From the total number of hours of CPD that you stated you did in the previous question, could you please estimate how many of these you spend on each of the following CPD activities

Developing subject expertise	
Developing teaching skills	
Finding out about strategies for meeting student needs	
Activities to meet organisational needs	

14. Could you please rank the following, from the activity carried out the most, to the activity carried out the least

	most frequent activity	second most frequent activity	third most frequent activity	least frequent activity
Subject updating				
developing teaching skills				
learning about student needs				
activities to meet organisational needs				

Developing subject specific expertise, continued

15. What activities do you do for the purpose of subject specialist updating? Please tick all that apply

- ☐ Attending a long course
- ☐ Attending a short course
- ☐ Attending a workshop
- ☐ Peer observation
- ☐ Accompanying students on educational trips
- ☐ Organising guest speakers
- ☐ Involvement with a professional body
- ☐ Reading journals and books
- ☐ accessing materials, resources or communities on-line
- ☐ Practising in the subject specific area
- ☐ Industrial placement
- ☐ Shadowing someone in the subject specific profession

Other (please specify)

16. Please indicate whether you have encountered any of the following difficulties in maintaining and developing your subject specific expertise. Please tick all that apply

- ☐ I have no problems in maintaining and developing my subject specific expertise
- ☐ I could not secure funding
- ☐ I could not identify appropriate activities
- ☐ I could not find the time to develop my subject expertise
- ☐ I needed to prioritise other CPD activities over my subject development
- ☐ Other*

*Other (please explain)

17. Please describe the most valuable activity that you have carried out for the purpose of subject updating

5 Professional associations

This section explores professional associations that enable teachers to develop subject specific expertise

18. Can you indicate whether you belong to, or know of any professional associations that can be used to help develop subject specific expertise?

- I am a member of a subject association for teachers
- I am a member of a professional association that I also use for subject specific updating
- I know of an association that could be used for subject specific updating, but am not a member

19. Could you give the names of any professional associations that you belong to, or have heard of, that can be used for the purpose of subject updating

20. If you are a member of an association you use for the purposes of subject updating, how useful do you find this?

- Not applicable. I do not have an association that can be used for subject updating
- I find it very useful
- I find it fairly useful
- I do not find it particularly useful
- I do not find it useful at all

21. If there is no professional association in your subject area, how useful would it be for your subject development if one were to be set up?

- Not applicable. I belong to an association used for subject specialist updating
- Very useful
- Fairly useful
- Not particularly useful
- Not useful at all

22. Have you any other comments about professional associations

Thanks you for taking the time to complete this questionnaire.

23. If you are willing to take part in follow-up interviews to share your experience of subject specific updating, could you please give your contact details below

Name	
e-mail	
Telephone number	

Appendix Three: Follow-up e-mail

Dear colleague,

You may remember that I sent you an e-mail recently asking about how you maintain and develop your subject specific expertise. The information is being collected as part of my research for my Doctorate in Education thesis at the Institute of Education, University of London. I would be really grateful if you would complete a short questionnaire about your subject specific development.

Taking part in the process

I hope that you will agree to take part in the process by completing the following questionnaire. It should take no more than five minutes to complete. However, you don't have to take part in this study if you don't want to. If you decide to not take part, please ignore this e-mail, or click on the last link in this e-mail, which will remove you from my mailing list.

If you agree to take part in the process, please complete this on-line questionnaire as honestly as you can by Monday 7th November, 2011. Please skip any questions that you feel you cannot or do not wish to answer.

There is more information about the survey, follow-up research, anonymity, and what will be done with the data on completion, on the front page of the questionnaire.

Here is a link to the survey:

https://www.surveymonkey.com/s.aspx

This link is uniquely tied to this survey and your email address. Please do not forward this message. However, if you know of a colleague who would be willing to complete the questionnaire, please e-mail me for an alternative link.

Thank you for your participation.

Janet Broad

Please note: If you do not wish to receive further emails from me, via survey monkey, please click the link below, and you will be automatically removed from the mailing list.

https://www.surveymonkey.com/optout.aspx

Appendix Four: Interview schedule

Respondent ----------

Date ----------

Explain the nature of the research

Background information

Could you describe the CPD activities you have done in the last year to maintain and develop subject expertise (longer ago if anything really stands out)

What were the reasons for doing each of these activities?

Thinking of the CPD discussed earlier, which were (one was) the most valuable?

How important to you is developing and maintaining SS expertise?

Why is it important?

Does your employer place similar importance on you developing and maintaining SS expertise?

If not same, why do you think this is so? Does the employer have different priorities?

Thinking of the activities we have talked about, how were these identified and initiated?

How many hours of CPD do you think that you did last academic year?

How much of this was devoted to SS development?

Any barriers to SS updating

In an ideal world, what would be the thing that you would most like to do to develop SS expertise?

Are you a member of professional association?

In what ways, if any do you use this (these) for the purposes of subject updating?

How valuable do you find this?

Any further comments on maintaining and developing SS expertise?

Don't forget to thank the interviewee

Appendix Five: Information sheet

Project title: Doing it for themselves: An exploration of how teachers in the 'Lifelong Learning Sector' in England maintain and develop subject specific expertise

Thank you for taking the time to read this information sheet. This study is being undertaken for a thesis being undertaken as part of a Doctor of Education programme at the Institute of Education, London University (IOE). I hope that after reading this information sheet, you be willing to be interviewed.

About the study

This study forms the basis of a thesis to explore how teachers in the Lifelong Learning Sector maintain and develop their subject specific expertise. As the formal requirement for CPD in the sector is relatively new, there is currently very little research into how teachers maintain and develop their subject expertise. Therefore, it is hoped that this study will also help to inform changes and improvements to CPD provision.

You have already taken part in the research by completing an on-line questionnaire. This has been analysed and three key themes emerge from this that will be explored in more detail in these interviews. The three themes are:

Teachers say that maintaining and developing subject expertise is very important for them. However, they view it as not so important for their employing organisation

In maintaining and developing subject expertise, teachers take part in a wide variety of activities in a range of settings

Some teachers use professional associations as a means of developing their subject expertise.

About taking part in the interview

Taking part in the interviews is completely voluntary. You do not have to take part if you do not wish to. The interview should take around 40 minutes to complete. If you do take part, the information provided will be anonymous. Your name will not be used and responses to the interview will not be able to be tracked back to you in subsequent reports written about the findings and comments at interview. If you agree, the interviews will be tape recorded, with the recordings securely stored and available only to the researcher and doctoral supervisor. If you do not wish to be recorded, detailed notes of your responses will be taken. You can decide to withdraw from the research at any time by contacting me, using the contact details at the end of this information sheet.

What happens to the results of the interviews?

The results of the interviews will be used as part of a doctoral thesis that is being undertaken at the IOE. Key themes emerging from the findings may be shared with other teachers and researchers as part of the scholarly process by presentation of papers at conference and for inclusion in peer reviewed journals. Again, anonymity will be assured and your name will not be used and responses will not be able to be tracked back to you.

The responses to the interviews will be kept until the final report has been produced. At this point all recordings will be deleted and interview notes will be destroyed.

If you are happy to take part in the study, please sign and date the consent form provided.

If you have any questions or comments about the interviews or the study, you can email or telephone Janet Broad on j.broad@ioe.ac.uk or 07956 306471

Appendix Six: Consent form

Project title: Doing it for themselves: An exploration of how teachers in the 'Lifelong Learning Sector' in England maintain and develop subject specific expertise

Consent form for those taking part in the interview process

Conducted by Janet Broad as part of her doctoral research

I confirm that I have read and understood the information sheet relating to the study and give my consent to take part in the project.

I understand that the interview will be recorded and agree for the recording to be held securely by the researcher until completion of the project.

Print Name ----------

Signature ----------

Date ----------

Interviewer ----------

Date ----------

Appendix Seven: Observation recording tool

Event ----------

Date ----------

Where is the event happening, description of the physical space

How many people are there, their identities and characteristics

Objects - the artefacts and physical things that are there

Events - the sets of activities that are taking place

What are the goals to be achieved

Acts - the specific actions that the participants are doing, what is regular, patterned, irregular in terms of behaviours

What is being discussed

What appears to be the significant issues

Appendix Eight: Interview schedule for awarding bodies and other stakeholders

Explain the nature of the research
Ask respondent to read the information sheet and complete the consent form.
Key points: Part of Ed D. recording, ethical considerations.

Background information
Tell me about the organisation. What does it do? How long has it been doing it?

Briefly what is your role?

Do you have a remit for CPD? If so, in what ways?

Does the organisation play any role in CPD for teachers?
Requirement
Courses
Networks
Linking to other bodies

What were the main reasons for doing each of these activities?
IS CPD the central reason or are they done for other things and CPD is a side advantage?
Mention the three drivers for CPD

If these are provision, how are these funded and where do they take place?
If not, if monitoring, how does this happen?

Are any of these specifically for subject development?

Is the organisation involved in other activities that may, as a side result, help teachers to develop their subject specialism?

Any further comments?
Don't forget to thank the interviewee

Appendix Nine: Interview record

Date	Activity	Interview location
	Stage two interviews	
01/12/2011	Early years teacher	Central London college
07/12/2011	Applied sciences teacher	East London College
08/12/2011	Construction teacher	My place of work
15/12/2011	Teacher of students with learning difficulties	West Essex College
16/12/2011	Business studies teacher	North West London College
18/12/2011	Hairdressing teacher (A)	North London College
17/01/2012	Graphic design teacher	Specialist Art College, London
	Stage three interviews	
13-14/01/2012	**Executive committee for AHT** Informal group interviews with AHT hairdressing teachers	Blackpool Hotel
27/02/2012	**AHT regional competition** Informal interviews with hairdressing teachers and judges Formal interview with AHT hairdressing teacher (B) Formal interview with competition judge	South London College
29/02/2012	**Non AHT competition** Informal interview with wholesaler of hairdressing products	North London College
07/03/2012	APCT chair interview	My place of work
20-22/04/2012	**AHT conference/ seminar** Informal interviews with hairdressing teachers Formal interview with AHT chair Formal interview with two AHT hairdressing teachers (C and D)	Leicester Hotel
15/05/2012	HR manager interview	My place of work
17/05/2012	VTCT representative interview	VTCT offices
17/05/2012	IfL representative interview	IfL offices
22/05/2012	Formal interview with AHT hairdressing teacher (E)	My place of work
20/06/2012	City and Guilds representative interview	C&G offices