

# **Experiencing Academic Staff Development through TPACK: A Phenomenographic Study.**

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Department of Educational Research

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## **Declaration**

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I hereby declare that the work presented in this thesis has not been submitted for any other degree or professional qualification, and that it is the result of my own independent work.

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Date: 31<sup>st</sup> March 2023

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## **Abstract**

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The Technology, Pedagogy and Content Knowledge (TPACK) framework has predominantly been used to inform the development of pre-service teachers in the integrated use of technology in their teaching. This thesis seeks to extend the use of TPACK and as such examines the experiences of academic staff, at a single higher educational institution in the United Kingdom, in using TPACK as a framework for their professional development. This research adds to existing TPACK related research through understanding the extent to which the framework might be used to inform a more holistic approach to digital skills development of academic staff.

Using phenomenography as the research methodology, data is collected through semi-structured interviews, analysed and presented through the conceptions and resulting outcome spaces to show the variations by which the participants experience the use of TPACK in the context of their professional development. The findings show that participants experience their professional development in a hierarchical manner, as presented through the outcome spaces. The types of development experienced range from informal conversational development through to much more formal external academic research conferences, all of which contribute to an individual's complex development requirements. The range of development activities were identified to have a varying level of reach or impact, from development that is a 'requirement' which has limited reach beyond the individual, to development which impacts curriculum and students over many years. Additionally, the way in which participants experience TPACK as a framework is equally as varied, from those who experience it as single knowledge forms through to a more complex inter-connected knowledge forms with contextual relationships.

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These findings help educational developers and academics understand more clearly the range of development experiences required to support holistic professional development, as well as providing insights into the various complex ways in which individual academic staff will experience the same framework. Additionally, it was possible to determine the extent to which the TPACK framework is effective for academic development units in assisting them to identify development needs and provide appropriate development opportunities, with a more integrated approach to digital skills development that uses TPACK as a basis to provide a more holistic model of professional development for academic staff.

## **Abbreviations**

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- ALT - Association for Learning Technology
- CLT – Centre for Learning and Teaching
- DIAD – Digitally Integrated Academic Development
- HEA – Higher Education Academy (now Advance HE)
- HEFCE – Higher Education Funding Council England
- HEI – Higher Education Institution
- ICT – Information Communication Technology
- Jisc - Joint Information Systems Committee (now just Jisc)
- RSA – Research and Scholarly Activity
- TEL – Technology Enhanced Learning
- TDPK – Technology, Pedagogy and Discipline Knowledge
- TPACK – Technological, Pedagogical and Content Knowledge
- UK – United Kingdom
- US – United States

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## **Chapter 1: Introduction**

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### **1.1 Aims and rationale.**

Historically, approaches to digital skills development have often been undertaken in isolation, relative to wider development activities (Falloon, 2020) and a more integrated approach to eLearning is necessary to overcome some of the barriers associated with digital skills development (G. Singh & Hardaker, 2014). This has been exacerbated by separate e-learning strategies and the recruitment of roles specific to the development of staff digital skills for learning and teaching (e.g. learning technologists).

Even where the digital literacy skills development of staff has been closely integrated into school-based needs it was seen by academic staff to be separate to and not integrated with their other development activities due to “a lack of systematic institution-wide engagement with digital literacies”. (Newland & Handley, 2016, p. 10). The problem then, is that segregation of the digital skills development appears to both act as a barrier to wider engagement from academic staff as well as presenting digital skills as a separate activity to wider professional development which subsequently means there is a failure to improve the use and effectiveness of digital tools for learning and teaching at a large scale.

One higher education institution (HEI) based in England, United Kingdom has sought to address this challenge through the use of an approach to academic skills development which draws upon a framework previously used to integrate digital skills development into teacher training education. This approach has been used with a number of academic staff as part of a flipped classroom style development activity. Therefore, this thesis seeks to examine the extent to which academic staff at this institution experience a more holistic approach to their digital development when making use of the framework which is specifically designed to integrate technology, pedagogy and subject knowledge. More specifically this thesis will examine the

experience of academic staff using the Technological, Pedagogical and Content Knowledge (TPACK) framework in the context of their professional development and the extent to which this has the potential to support a more holistic experience of professional development of academic staff that incorporates the technological and digital skills element that has so far proven to be challenging.

## **1.2 Research site.**

This study is based at a Post-92 higher education institution in the North of England (UK) with a predominantly campus based student population of approximately 25'000 and a total staff population of approximately 3000, of which 42.4% were academic staff at the time of the study (2017). In 2015, through the reorganisation of their Centre for Learning and Teaching (which introduced a dedicated senior academic role to co-ordinate digital education) the institution began making use of TPACK as an overarching framework for all academic staff development with the intention to align the digital skills development of academic staff more closely with their pedagogic development. This approach was designed to fulfil ambitions of the university's digital strategy and improve the student experience through the effective use of digital tools and services for learning and teaching. This is further discussed in a the chapter following this one, which also situates the digital skills development ambitions of this institution within the broader political and sector-wide contexts that were driving these decisions.

## **1.3 Researcher positionality.**

In the context of this study I am both the researcher and also contribute to the work of CLT and the design of the academic development activities. I played a leading role in introducing TPACK as a potential framework for use within the institution (having been introduced to it through the teaching on this PhD programme), although the decision to use it was a collective one. My role within CLT was one which included being course leader for the Post Graduate Certificate in Academic Practice (PGCAP) which, it had been strategically agreed, would be moving to a

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blended model so as to reduce the requirement for academic staff to spend as much time in face-to-face sessions, as this had been identified as a barrier to engagement and practically presented challenges of timetabling for some Schools. Therefore, TPACK was identified as being a framework which could both inform the design philosophy of the PGCAP as well as underpin the approach to all professional development activities run by CIE for academic staff to which I would also contribute.

Wishing to understand the extent to which the use of TPACK as a framework for this activity was effective, I saw an opportunity to use the PhD as a mechanism for examining the lived experiences of academic staff in using it. This interest was both a personal one (in so much as it was my suggestion to make use of TPACK in this context) but also a collective one as the Centre for Learning and Teaching, and more broadly the institution also wanted to understand the extent to which it was effective. Whilst this might have posed a challenge in the sense that I was both the originator of the framework implementation and associated activities and also the researcher, the fact that I left the institution prior to starting the data gathering meant that I was more clearly able to separate out my role within the institution and the work I did to bring TPACK to the academic development process and my role as PhD researcher. It was 12 months from the time which I left the institution to when I started my data gathering with participants and so this helpfully created some space between when I had introduced TPACK as a framework and when I would be interviewing participants about their experience of using it in the context of their professional development. Additionally, the use of bracketing to ensure data validity helps the researcher ensure that their role as the interviewer and data analyser are also not compromised, this is discussed in more detail in Chapter 6.

## **1.4 Research questions.**

This thesis offers a unique opportunity to examine the experiences of academic staff when using this framework as part of an institutional approach to their professional development. This research will seek to develop a comprehensive understanding of the ways in which staff experience the use of TPACK as part of a professional development process at a single UK higher education institution (HEI) and inform the which will be addressed through the questions set out below.

### **1.4.1 Research Question One**

The purpose of this first research question is to investigate and understand the diverse qualitative variations in how academic staff experience professional development through the Technological Pedagogical Content Knowledge (TPACK) framework. The question aims to explore how these variations influence the identification and planning of professional development activities using TPACK and how staff perceive TPACK as a framework for their professional development within the higher education setting.

The overarching question being explored is:

*RQ1: How does the qualitative variation in academic staff's experiences of professional development through Technological Pedagogical Content Knowledge (TPACK) influence their identification, planning, and overall perception of TPACK as a framework for professional development within the context of higher education?*

This is investigated through three interconnected sub questions which help us breakdown components of the study into question which are specifically answerable, but which focus on different facets of the same overarching theme:

*RQ1a: What distinct qualitative factors can be derived from the nuanced experiences of academic staff in their professional development through the application of TPACK?*

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This sub question lays the groundwork by exploring the qualitative variations in how academic staff experience professional development through TPACK. It helps to uncover the diverse ways in which individuals perceive and engage with TPACK in their professional development. It seeks to identify the various ways in which academic staff at the institution have experienced development activity, using the TPACK framework in the process of exploring their academic development. Through in-depth analysis of participant interview data this question will explore the finite ways in which this is experienced and examine the structural relationship to better understand staff experiences of this phenomenon.

*RQ1b. What distinct qualitative elements can be identified through the experiences of academic staff in how they discern and strategise their professional development planning within the TPACK framework?*

This question delves into the qualitative differences in how staff identify and plan their professional development activities within the TPACK framework. It sheds light on the individualised approaches and strategies that academic staff employ based on their experiences with TPACK. The question specifically seeks to examine lived experiences of academic staff as they use TPACK to identify their needs for and plan their professional development. Gaining knowledge of this will assist those who may be running academic development programmes in HEIs in supporting academic staff and line managers to better identify and plan for the development needs of academic staff.

*RQ1c. What inherent qualitative factors contribute to the diverse ways in which staff perceive and engage with TPACK as a framework for professional development?*

This question explores the qualitative variations in how staff perceive TPACK as a framework for professional development. It delves into the subjective, personal experiences and

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perspectives of academic staff regarding the efficacy and impact of TPACK on their professional growth and seeks to understand those experiences and the limited variation of them.

These research questions seek to make several important contributions to the understanding of academic staff's experiences with professional development through Technological Pedagogical Content Knowledge (TPACK) within the higher education context:

### **1. Exploration of Qualitative Variation:**

- The question focuses on qualitative variation, acknowledging that academic staff may have diverse and nuanced experiences with TPACK. This emphasis allows for a comprehensive exploration of the richness and complexity of individual experiences within the professional development context.

### **2. Integration of TPACK Framework:**

- By focussing on the experience of using the TPACK framework, the question recognises the interconnected nature of technological, pedagogical, and content knowledge in teaching and learning. This integration aligns with contemporary educational practices that emphasise the need for educators to seamlessly integrate technology, pedagogy, and subject matter expertise.

### **3. Influence on Identification and Planning:**

- The question explicitly addresses how the qualitative variation in experiences influences academic staff's identification and planning of professional development activities. This provides insights into the factors that shape their decisions, strategies, and choices when engaging with TPACK in the context of ongoing professional development.

### **4. Impact on Overall Perception:**

- The question goes beyond specific activities and explores the overall perception of TPACK as a framework for professional development. This broad perspective allows the research to uncover the holistic view that academic staff have regarding the effectiveness, relevance, and value of TPACK in enhancing their professional practices.

**5. Higher Education Contextualisation:**

- By situating the research within the context of higher education, the question recognises the unique challenges, opportunities, and dynamics present in this setting. This contextualisation is essential for understanding how TPACK operates within the specific environment of higher education institutions, where the time demands on educators are multifaceted.

**6. Alignment with Phenomenography:**

- The question aligns with a phenomenographical approach, emphasising the lived experiences of academic staff. Phenomenography is the methodology selected for this study and seeks to uncover the essence of individual experiences, and in this case, it allows researchers to explore the subjective and personal dimensions of how academic staff engage with TPACK in their professional development.

**1.4.2 Research Question Two**

Whilst the central focus of the first question is to understand the variation of experiences that staff have using TPACK in the context of their professional development, question 2 (RQ2) will be the opportunity to draw upon the data and subsequent analysis to establish the extent to which TPACK is an effective framework for use in the context of higher education professional

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development. Through understanding the experiences of academic staff in the use of TPACK this research also offers up an opportunity to examine the effectiveness of the framework which will be of interest to a range of stakeholders, but particularly those seeking to embed TEL development as part of a more holistic approach to academic staff development.

*RQ2: To what extent does the integration of Technological Pedagogical Content Knowledge (TPACK) as a framework for academic staff development effectively support a more holistic approach to academic development?*

This research question contributes to our understanding of how TPACK facilitates a holistic staff development model by emphasising its role in supporting a more integrated approach to Technology-Enhanced Learning (TEL) development. By exploring the extent of TPACK's effectiveness in this context, the question addresses the multifaceted nature of staff development, incorporating technology, pedagogy, and content knowledge.

The question highlights the potential of TPACK to act as a unifying framework, encouraging academic staff to seamlessly integrate technological tools, effective pedagogical strategies, and subject matter expertise in their teaching practices. Through this lens, the research aims to uncover the ways in which TPACK contributes to a more cohesive staff development model that aligns with the demands of time limited higher education staff, where technology is an integral component of effective teaching and learning.

The emphasis on the integration of TPACK with TEL development underscores the importance of a unified and synergistic approach to professional growth. Ultimately, the research seeks to provide insights into how TPACK can serve as a catalyst for a more holistic staff development model, fostering the skills and knowledge necessary for effective and innovative teaching practices in a digital age.

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In summary, these research questions contribute by providing a comprehensive and nuanced exploration of the qualitative variation in academic staff's experiences with professional development through TPACK. They address key aspects such as identification, planning, and overall perception, offering insights that can inform the development and improvement of professional development programs within higher education. Through examining the qualitative variations, the research questions aim to contribute to the knowledge base surrounding effective professional development strategies in higher education, specifically focusing on the integration of technology, pedagogy, and content knowledge. Ultimately, through these questions the findings can inform educational institutions and policymakers in optimising professional development programs tailored to the needs and experiences of academic staff specifically in relation to their TEL development and the potential value of using the TPACK framework as a strategic mechanism to achieve this.

#### **1.5 Research approach.**

As the core purpose of this research is to understand the experiences of academic staff in using the TPACK framework for their professional development, it is necessary to be able to understand the variation of individual experiences. These variations will need to be captured and analysed qualitatively in order to identify and categorise those experiences and provide a mechanism through which to present conclusive evidence of the finite ways in which that phenomenon can be experienced. To facilitate this, I will be using phenomenography as the research approach. Phenomenography is a valuable research method for investigating the use of TPACK as a framework for professional development of academic staff in higher education institutions because it focuses on understanding the ways individuals perceive and experience a particular phenomenon, such as their development of digital and technological skills in the context of learning and teaching. This method provides a rich and nuanced understanding of the multiple perspectives and experiences of academic staff, allowing for a deeper exploration of the

complexities and challenges of TPACK implementation. Furthermore, phenomenography can highlight the diverse ways in which TPACK is understood and applied by different individuals, providing insights into the potential barriers and enablers of effective TPACK implementation. By using phenomenography as a research method, it is possible to gain a more comprehensive understanding of the ways TPACK is experienced and the implications for professional development programs in higher education.

Phenomenography emerged in the late 1970's from the study of university student's experience of learning (Marton & Säljö, 1976). Although more often used for studying the experience of learners (Booth, 2008; Eckerdal, 2006; Han & Ellis, 2019; Trigwell, 2006) as a qualitative research approach of an empirical nature it has now also been used to explore people's experiences in other fields such as healthcare (Barnard et al., 1999), and is also ideally suited to the aims of this study in examining the experiences of staff in the context of teaching, as already evidenced through its use in a number of other studies (Åkerlind, 2008; Beutel, 2010; S. Daniel, 2021; Prosser et al., 1994). In all of these studies the authors have made use of phenomenography to describe the variation of experiences of participants within their own contexts, which is ultimately the intention of this thesis. These previous uses of phenomenography not only provide a strong rationale for its use in this study but also demonstrates its strength as a methodology which can be used in a range of contexts. Chapter 4 provides a more detailed presentation of this research approach and additional reasons for its selection.

## **1.6 TPACK as a theoretical framework.**

This thesis draws heavily on the TPACK framework through which to understand staff experiences of academic development, particularly in relation to their digital skills development. It is both a framework which is being studied, but also acts as a framework through which to

understand the experiences of academic staff. As detailed in the literature review chapter, TPACK is an extension of Schulman's (1986) pedagogical content knowledge, to which Mishra and Koehler (2007) added the technological knowledge domain in recognising "technological knowledge is an integrated aspect of teacher knowledge" (Fransson & Holmberg, 2012, p. 196) and that the intersection of these domains is critical to teacher education and modern teaching. TPACK has predominantly been used in two research areas, the first focussed on pre-service teacher development and in-service teacher activity and the second on students' perceptions of teachers "TPACK" (Jang & Chang, 2016). When teachers are working at the intersection of these domains they are "developing a nuanced understanding of the complex relationships between technology, content, and pedagogy, and using this understanding to develop appropriate, context-specific strategies and representations." (Mishra & Koehler, 2006, p. 1029) and so in this study the TPACK framework is the central theoretical framework through which I am seeking to understand the experiences of academic staff development and additionally the extent to which TPACK is effective outside of its original intended domain. This thesis also examines the emergence of digital skills and literacies as an area of academic staff professional development, the political landscape from which it emerged, the challenges associated with engaging academic staff in this area of skills development and approaches designed to address those challenges, noting that "that policy has made digital competence an objective in itself by promoting teachers' professional development (TPD) in different educational settings" (Pettersson, 2018, p. 1010).

### **1.7 Significance of the study.**

There is very limited research on the use of TPACK being used for professional development in a higher education context, and even more limited when this is considered in a UK context. Whilst there are have been number of studies which explore staff experiences in relation to educational development (Ashwin & Trigwell, 2010; McComb et al., 2021; Smyth, 2003) and more specifically

approaches to their digital skills development (Garcia et al., 2013; Morris & Wilson, 2016; Newland & Handley, 2016; Secker, 2020) as well as reviews of e-learning frameworks themselves (T. Mayes & De Freitas, 2013) there is a limited number of empirical studies which examine the experiences or effectiveness of these approaches from an academic staff perspective (Wallace, 2018). As described in more detail later on in this thesis, the use of TPACK in Higher Education academic development is extremely limited “scholars in the field have not adequately studied first-hand experiences of instructional technology administrators and education faculty on TPACK professional development opportunities” (Wallace, 2018, p. 7) and so this study will be of significant interest to those persons who are responsible for engaging academic staff in professional development and more specifically digital skills development, TEL activities and a wider digital pedagogy and are seeking experiences from which to develop strategy or frameworks for their use.

As mentioned previously, the institution in question currently uses TPACK as a staff development framework through which to map the development needs of academic staff. However, they do not fully understand the extent to which this is effective or have a clear understanding of the experiences of staff using this process. Therefore, within this study I will be uniquely positioned to explore academic staff experiences of using TPACK as a mapping tool for their development activities, with the potential to analyse those experiences and identify effective strategies for engaging staff in digital development and integration into their learning & teaching practices. This will be of interest not just to the institution in question but to the wider higher education academic development community who are working across the sector to embed digital literacy skills as part of academic development activities and dealing with “the strategic challenge to implement new technologies in a sustainable way in universities” (Schneckenberg & Wildt, 2006, p. 1). This study will not only be expanding on the limited field of research in the area of TPACK

use in higher education, but more specifically I will be adding to knowledge in this area with a phenomenographic approach which seeks to identify the limited variations participants can have of the experience in using TPACK as a staff development framework.

In terms of knowledge contribution this thesis will firstly add to the established research into the use of TPACK, but more specifically present research into the use of the framework in the context of an institutional approach to professional development of academic staff. Additionally, this study will add to the wider knowledge that already exists relating to the development of digital skills in higher education teaching and the extent to which a framework can be effective in supporting a more holistic approach. Finally, the study will uniquely provide insights into the experiences of academic staff in relation to the reviewing, planning and engagement in activities associated with their professional development. Practically, this research will potentially help individual academics in the holistic planning of their professional development, particularly where they may be seeking to make the use of any allocated time for professional development and where they are intending to identify digital skills development. For academic developers and their institutions this study will provide detailed experiences of staff in using a framework such as TPACK and offer insights into the effectiveness of such frameworks to help inform their own approaches to the professional development of academic staff for learning, teaching and research. Finally, the findings from this study will also be useful to the institution where the study takes place and help inform university policy and process in relation to the continuing professional development of (academic) staff and the work of units such as their Centre for Learning and Teaching.

## **1.8 Thesis structure.**

This thesis is presented through nine chapters. This current chapter provides an introductory overview of the research and sets out the aims and general approach to this study, additionally It

establishes a rationale for the study and helps orientate the reader as to the structure. Chapter 2 provides a more detailed political and educational context from which this research has ultimately been developed. It presents the emergence of digital skills (literacies) as an element of academic development and the basis from which frameworks like TPACK emerged in order to support the integration of digital skills development into wider development activities in a range of education sectors. In Chapter 3 I present a detailed literature review of the emergence and use of TPACK as a framework, ultimately focussing on its use in a higher education setting. This chapter is intended to give readers an in-depth understanding of the TPACK framework so as to situate its relevance and application in the context of the phenomenon within which participants will be experiencing it. Chapter 4 provides an overview of the phenomenon being experienced by the participants. The purpose of this is to give an insight into how the TPACK framework is being used in the context of this particular higher education institution's activities relating to the academic development of staff, including their digital skills development and is ultimately the phenomenon through which the lived experiences are studied. The research methodology of phenomenography is the focus of Chapter 5 including a definition, its philosophical underpinning and unique aspects of using this approach. This chapter also sets out a rationale for using phenomenography as well as comparing it to other methodologies so as to better understand why this approach is being used. Chapter 6 details the research process, examining how the data was collected and analysed as well as providing details of how the validity and reliability of the data is assured. Chapter 7 then presents a detailed description and analysis of findings with each category of description explored in depth followed by Chapter 8 which then discusses the findings in more detail and presents a synthesis of those findings in relation to the existing literature as well as presenting implications of them. Finally, Chapter 9 is a conclusion chapter, with a summary of the key findings, revisiting and answering the research questions as well as

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presenting the implications and limitations of the study and additionally opportunities for future studies.

## **Chapter 2: Research Context**

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### **2.1 Academic Development.**

Whilst chapter one provides an introduction to the research overall chapter two will set out the wider context through which this thesis has emerged. Initially in first chapter I will present the historical, higher education landscape through which the digital skills development of academic staff became such a significant component of their expected professional development activities. This background will help the reader understand both the context for the design of the phenomenon being experienced (described in more detail in Chapter 5) but more importantly the rationale for using the Technological, Pedagogical and Content Knowledge (TPACK) framework as a point of reference towards a more holistic approach to the digital skills development of academic staff, around which the experience of the participants within this study is based.

To begin with, it is important to note that the terms “academic development” (Boud, 1999), “academic professional development” (Ferman, 2002) and “educational development” (Gibbs, 2013) are used interchangeably within the wider literature, even within the same journal publication (in this case the “International Journal for Academic Development”) but all broadly meaning the development of academic staff in relation to their professional development, including learning and teaching activities. This thesis will also use these terms interchangeably in line with the relevant literature being discussed at the time, but with a broad common meaning being that it “refers to the process whereby employees of an organisation enhance their knowledge and skills in directions that are advantageous to their role in the organisation” (Marriss, 2011, p. 1). More specifically, particularly in higher education, it is generally accepted as being “an on-going process of education, training, learning and support activities that is concerned with helping academics to grow within the organisations in which they are employed” (Machingambi, 2016, p. 321; Northedge, 2003).

## **2.2 The emergence of digital literacies in the United Kingdom.**

The emergence of e-learning in the early 2000's and in particular the rapid deployment of virtual learning environments (VLEs), particularly within universities, saw technology (and all its proposed economic and administrative benefits) become the focus of the implementation activity rather than the pedagogy and as such resulted in academics "flapping" rather than "flying" in these new online spaces (Salmon, 2005). Although the ambitions for successful e-learning implementation were clearly set out, as exemplified through the 2005 Higher Education Funding Council for England (HEFCE) strategy for e-learning, there remained issues around adoption and effective use of technology for learning and teaching (Sharpe, Benfield, & Francis, 2006). Even though HEFCE specifically indicated that a measure of success would be that "staff are supported at all stages to develop appropriate skills in e-learning" (HEFCE, 2005, p. 9) the fact was that staff were largely unwilling to change teaching practice without understanding the potential benefits (for them) and any impacts it would have (Salmon, 2005). Despite the fact that numerous institutions subsequently developed and implemented institutional-wide 'e-learning strategies' (Mackeogh & Fox, 2009; Salmon, 2005; Sharpe, Benfield, & Francis, 2006) the resulting strategy was often perceived differently by various stakeholders within an institution (S. Thomson, 2016) and often struggled to have any significant impact on the learning and teaching or any evidence of change in staff practices especially if implemented with a 'top down' approach (Mackeogh & Fox, 2009).

Lack of time and departmental culture have consistently been identified as significant barriers and they still remain the two biggest barriers to staff development in the use of technology enhanced learning (TEL) (Glowatz & O'Brien, 2017b; Walker et al., 2018) coupled with the fact

that much of the research into the use of technology in universities lacked theoretical underpinning or real evidence of positive impact on pedagogical practice (Price et al., 2016).

However, the increased use of technology within higher education teaching environments has required that academic staff have had to engage, at some level, in the development of their digital skills and capabilities in order to be able to make effective use of these technologies. In addition to this, the development of digital literacy skills in a future graduate workforce was of significant importance to the UK government (Payton, 2012) as well as it being seen as a fundamental skill for lifelong learning. Significant responsibility was placed upon UK Higher Education Institutions (HEIs) and colleges to offer this as a core aspect of their provision and this added additional pressure to the staff digital development agenda, but it was not clear the extent to which universities and colleges were effective at this or even had the capability to do so (Littlejohn et al., 2012). It was clear, therefore, that firstly digital literacy should be clearly defined in order that it could be understood and appropriately supported and secondly that universities and colleges should seek to prepare themselves for this inevitable activity. However, defining 'digital literacy' is complex, something that has taken place over many years (and continues to do so) and whilst it is not my intention to detail this complexity, understanding its emergence (within an educational context) will help us examine the challenges associated with the development of digital skills of academic staff. In his PhD thesis Doug Belshaw details the emergence of digital literacy as a term, observing that:

*After 'visual literacy,' 'technological literacy,' 'computer literacy,' and 'information literacy' ultimately proved unsuccessful, many sought to find a term more in keeping with digital communications and the Internet age. (Belshaw, 2011, p. 83).*

And whilst it is unlikely that a single definition will ever be agreed upon, what is clear is an expectation that the UK Higher Education sector "has an important role to play in developing the

skills, adaptability and mindset that goes with being digitally literate” (Times Higher Education, 2021, p. 5) and that academic staff within universities are expected to be able to support this through their own digital skills development strategies and activities.

Within the United Kingdom the emergence of digital literacy as a clearly defined concept (for colleges and universities) was almost entirely influenced by the work of the Joint Information Systems Committee (Jisc) (Newland & Handley, 2016). In particular, their ‘Developing Digital Literacies Programme’ which ran from 2011 to 2013, shaped the sector-wide understanding of digital literacy for both staff and students. Through Jisc, the UK Government funded twelve projects that took place in UK colleges and universities over the three-year period, the outputs of which strongly influenced the resulting framework that is used across the further and higher education sectors. The framework which emerged was centred around ‘seven elements of digital literacies’:

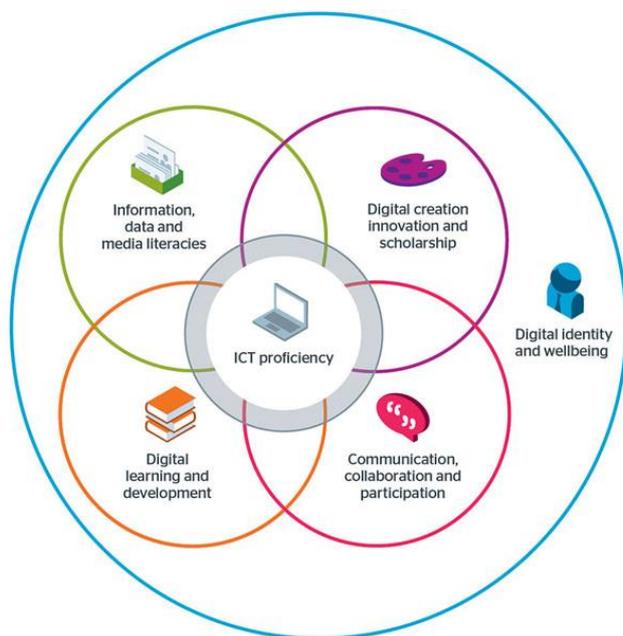
- Media literacy
- Communications and collaborations
- Career & identity management
- ICT literacy
- Learning skills
- Digital scholarship
- Information literacy

At the time of its development, the framework focussed on the digital skills required of students as they progressed through their study, and ultimately into employment, and placed little emphasis on the development needs of academic staff. However, in 2014 the UCISA digital capabilities survey report recommended that “UCISA should work with other agencies, such as Jisc, to adopt a standard definition of digital capabilities. We recommend institutions use this

definition where they have none.” (UCISA, 2014, p. 2). The intention of this was to identify the expectations around digital capabilities for (academic) staff and improve opportunities for sector benchmarking and sharing of resources.

This work resulted in further iterations of the Jisc framework as now presented in the ‘Six elements of digital capability’ (Figure 1) that forms the basis for both student and staff digital skills development.

**Figure 1 - Jisc Digital capabilities: the six elements model**



**Figure 1**

Note. From Beetham, H. (2015, June 11). *Revisiting digital capability for 2015*. Jisc Building Digital Capability Blog. <https://digitalcapability.jiscinvolve.org/wp/2015/06/11/revisiting-digital-capability-for-2015/>

This framework is now well recognised in the UK further and higher education sectors and having been developed over a number of years, through dozens of interviews and a rigorous review of “over 60 existing frameworks” (Beetham, 2015) it has established itself as a key point of reference in the sector in terms of defining the digital skills needs of students and staff in the UK post-16 education context. By 2019 the UCISA digital capabilities survey was now using the Jisc

framework as a reference point for a sector-wide definition and 90% of institutions were using the Jisc framework in whole or in part of their institution (Fielding et al., 2019) indicating that the sector had at least come to some agreement as to what “digital literacies” might reasonably be expected of academic staff in building capability in as part of their wider professional development, this aspect is explored in more detail in the next section.

### **2.3 Digital in the context of academic staff development.**

The professional development of academic staff in higher education has expanded significantly over the past 40+ years (Gibbs, 2013) and more specifically with the emergence of digital literacies for students this has subsequently meant that the digital skills development of academic staff has increasingly become a priority, in helping to close the digital skills gap between what might be possible with digital tools available for learning and teaching and the knowledge or experience that an academic member of staff may have to use those digital tools and technologies effectively for learning and teaching activities (particularly in the context of the United Kingdom (UK)). UK government policy, such as the Dearing report (Ronald Dearing, 1997) envisioned that “Information Communication Technology (ICT)” would improve the “quality, flexibility and effectiveness of higher education” (1997, p. 202). In their strategic approach to support the UK higher education sector, HEFCE (2005) set out a vision through which they “aim to support the HE sector as it moves towards embedding e-learning appropriately, using technology to transform higher education” (2005, p. 5) supported by £33m which was shared with 74 universities in England who subsequently created or updated their e-learning strategy. However, despite this considerable investment and advances in technology and investment in ICT provision within higher education there has historically been evidence of a distinct lack of change or impact with regards approaches to learning in teaching in comparison to other sectors (Cuban, 2001; Kirkwood & Price, 2014; R. Oliver, 2002; Price et al., 2016). In direct contrast to

HEFCE's vision, Kirkwood and Price's critical literature review covering the period 2005 – 2010 observed that "potential of technology to transform teaching and learning practices does not appear to have achieved substantial uptake" (2014, p. 24). It's not that technology isn't being provided, 95% of institutions were using a VLE (Browne et al., 2006) and this does not take into account additional technologies such as e-portfolios, lecture capture or polling systems. Additionally, the sector has seen a considerable shift towards a desire to "promote strategic change in the institutions' approaches to technology enhanced learning" (Handley, 2018, p. 99) with a view to closing the gap between the potential of technology and actual implementation of it. So why is it that despite technology enhanced learning (TEL) being promoted as an approach to enhance the quality of learning and teaching (Voce et al., 2016) alongside significant funding of activities in relation to ICT use and TEL through funding bodies such as the Higher Education Funding Council for England (HEFCE) & the Joint Information Systems Committee (JISC) and the emergence of dedicated UK professional bodies such as the Association of Learning Technology (ALT) there is still yet evidence of seeing significant changes in practice? After all, there are no shortage of models for e-learning with regards learning & teaching (Terry Mayes & de Freitas, 2004) and yet according to Van Buren and Sloman (2003) it has been identified that up to 62 percent of e-learning strategies end up in failure. Within one of my own small published studies I was able to identify that staff at different levels of seniority within a single institution saw an institution's e-learning strategy in very different ways to each other (S. Thomson, 2016) despite it being described and presented in a seemingly singular and coherent manner. Additionally, the barriers associated with the limited effective use of TEL are well documented and evidenced (Al-Alawneh, 2014; Rogers, 2000; UCISA, 2014; Voce et al., 2016; Zolghadri & Mallahi, 2013), although these rarely examine the experiences of academic staff in the context of their wider professional development activities which often sit outside the specific area of TEL or e-learning. So, whilst the government policy and sector funding of TEL

activity has sought to ensure that investment in technology and digital infrastructure are matched by the skills development of academic staff, the reality is that progress made has been slow and limited compared to what might have been expected and that a perceived “digital divide” exists between students and academic staff ability (Waycott et al., 2010).

#### **2.4 Digital Skills Development as a component of academic staff development.**

Since the emergence of technologies for learning and teaching there has been an associated need for the digital skills development of staff to form part of the wider academic staff development programme within an institution. As previously discussed earlier in this chapter, the growth in e-learning and associated technologies increased pressure on academic staff to develop digital skills and keep pace with the changes in technology (Selwyn, 2011). The emergence of a recognised sector-wide ‘digital capabilities’ definition as outlined above, provided an opportunity for Universities to embed ‘digital’ as part of their existing academic development programmes and as Garcia et al, (2013) observe:

*it is increasingly necessary for institutions to ensure that their academic staff are not only developing expertise in technology but also that they understand how students perceive technology and their expectations of usage within teaching and learning. (2013, p. 2043).*

UK Government funded projects (facilitated through Jisc and the now defunct Higher Education Funding Council in England (HEFCE)) such as Change the Learning Landscape, which ran from 2012-14, regularly sought to address the challenges around staff digital skills (or lack thereof) (Handley, 2018) alongside new technology implementations.

Early publications have consistently observed that “it is often difficult to convince such people [academic staff] that investment of their time in learning to use new technologies effectively will provide long-term gains, most especially in the current climate of competing priorities and

demanding deadlines” (Thompson, 2002, p. 155) and more recent publications identify that barriers still remain today despite the wider increased adoption of technology for personal and social use (Mercader & Gairín, 2020; Peansupap & Walker, 2006). Long before the development of digital skills the educational development of academic staff, with a specific focus on learning and teaching practice, has increased significantly since the recommendations of *The Dearing Report, Higher Education in the learning society* (1997), and in particular the recommendations for the establishment of the Institute for Learning and Teaching in Higher Education (ILTHE) whose key function was to improve the reward and recognition of teaching excellence across the sector (R. Dearing, 1997).

The subsequent white paper *The Future of Higher Education* (2003) additionally proposed the development of a nationally developed and agreed framework which sets out to provide “a framework for professional standards for teaching and supporting learning in higher education” (Higher Education Academy, 2011) which was formalised as the UK Professional Standards Framework (UKPSF) and co-ordinated by the Higher Education Academy (now Advance HE) with 126 UK higher education institutions having accredited continuing professional development (CPD) schemes aligned to the UKPSF (Advance HE, 2020). As of November 2021 over 150,000 individuals have achieved fellowship status (AdvanceHE, 2021) and the scheme continues to grow and has expanded globally. Although the UKPSF does refer to “the use and value of appropriate learning technologies” as part of its Core Knowledge (K4) the framework does not consider the wider digital skills or capabilities that would be applicable across all activity areas of the fellowships scheme. In order to address this both Jisc and the then Higher Education Academy undertook a mapping process to provide a “digital lens” on the UKPSF thereby bringing together the Jisc digital capabilities framework and the UKPSF to more closely align the digital skills development of academic staff with wider educational development and teaching practice

(Jisc & Higher Education Academy, 2017). This joint work by two leading higher education membership organisations meant that for the first time the sector had a professional recognition process aligned to the development of digital skills for academic staff, which in turn provided a reward and recognition route for engaging in such development activity through the UKPSF accreditation.

## **2.5 Approaches to developing the digital skills of academic staff.**

United Kingdom Higher Education Institutions (UKHEIs) approaches to the digital skills development of staff vary and are not well documented. Of those which exist the approaches taken are varied and “There appears no ready model—no single, clearly successful path—that ensures e-learning will be embedded.” (M. Oliver & Dempster, 2003, p. 144). The approach taken at Bournemouth University (UK) included the use of internally funded projects from a “Learning and Teaching Development Initiative Fund” (Hanson, 2003), alongside raising the profile of learning and teaching and its associated development as part of a ‘reward and recognition’ model that seeks to recognise staff for their skills and excellence in this area. At Oxford Brookes University in addition to the ‘reward’ element the development and implementation of a new e-learning framework (supported by the HEFCE funding previously mentioned) was a key driver to support change alongside employment of new learning technologist roles and local school-based “champions” supporting context relevant e-learning development (Sharpe, Benfield, & Francis, 2006). However, a study based on an experience at the University of Southampton concluded that “The experience of an institutional project, which tried with limited success to embed e-learning after the end of project funding, is not unusual” (White, 2007, p. 848) and so this might help to explain why not has much progress has been made since those early funding streams were withdrawn.

Within my own institution the driver for change was predicated on the creation of a new role “Head of E-Learning” and an associated e-learning strategy and in my own role as an academic member of staff and additionally as an educational developer, this has further led me to consider how to more effectively engage with academic staff through an increasingly holistic approach to their digital skills development, by integrating their pedagogic approaches and subject knowledge alongside use of technology (S. Thomson, 2007). Therefore, this thesis aims to explore the experiences of academic staff in the use of a framework specifically designed to support the integration of technological knowledge alongside pedagogical and subject based knowledge. The Technological, Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006) is described in more detail in a later chapter, but in summary was originally conceived as an extension to the Pedagogical, Content Knowledge framework (Lee S. Shulman, 1986) to support the technology integration for pre-service teacher education and is based around three core knowledge domains, technological, pedagogical and content knowledge. In the context of this study it has been used in a UK higher education setting as a professional development framework for academic staff and through this thesis I aim to better understand the extent to which a framework such as this is effective in developing a more holistic approach to academic staff development, including the development of digital skills.

## **2.6 Institutional context.**

As briefly described in the first chapter the Post-92 institution where this study takes place actively pursued ambitions to improve the digital skills and capabilities of their academic staff. This was a key institutional priority, underpinned by an updated digital learning strategy (previously e-learning strategy) and something for which the institution’s Centre for Learning and Teaching (CLT) was tasked to complete. CLT established an approach to staff development which was holistic in nature and made use of TPACK as the core framework against which all academic staff development would be framed.

Part of the rationale for this implementation was derived from some initial small-scale internal quantitative and qualitative data gathering which was undertaken to inform the Centre's reorganisation. A number of surveys and subsequent focus groups were undertaken with a group of academic staff who were currently completing an internal process supporting them in achieving fellowship of the Higher Education Academy (HEA) (now AdvanceHE). The internal survey and interviews gave insights into how academic staff made use of the time allocated to them for their professional development, mapping these against TPACK as a reference point for their responses. Of the twenty-four staff surveyed only 8% of them indicated that they had undertaken development in the technological knowledge domain (compared to 100% indicating development in the content (subject) knowledge and 54% in the pedagogical knowledge domain). This process highlighted the historical segregation of these domains by academic staff, rather than the integration and a clear imbalance of development time being spent across the three domains and more specifically strongly weighted against technological knowledge development and echoes the wider experiences of digital skills development already presented earlier in this chapter. Additionally, as part of other internal discussions about workload allocation models, analysis showed how staff were making use of their allocated research and development time (specifically referred to as research and scholarly activity (RSA) time). This identified that academic staff were using their RSA time predominantly for subject-based development, a little for pedagogical development and almost none of that time for technological development and as such both motivation towards and time spent in these areas of development were unequal. Therefore, as part of the restructure of the Centre for Learning Teaching (CLT) the TPACK framework was adopted to shape a new approach to academic development. In one such newly created development activity staff us TPACK to explore the

integration of “digital” alongside their pedagogic development and approaches. The intention of this was to actively engage academic staff in discussions around the use of technology in learning & teaching and take a deeper, critical approach to this drawing upon around a “digital pedagogy” philosophy.

“Digital Pedagogy is precisely not about using digital technologies for teaching and, rather, about approaching those tools from a critical pedagogical perspective. So, it is as much about using digital tools thoughtfully as it is about deciding when not to use digital tools, and about paying attention to the impact of digital tools on learning.” (Stommel, 2011).

This approach to aligning digital and pedagogical skills development formed part of a range of development activities designed and facilitated by the Centre for Learning and Teaching who was tasked with taking overall responsibility for the professional development of academic staff within the institution. The intention of this study is to examine the lived experiences of the staff who have been engaged in this TPACK informed process, in order to consider the extent to which this is effective in increasing staff awareness and engagement in their digital skills development and use, as well as examine the effectiveness of TPACK in supporting staff to reflect, plan and engage in a more holistic approach to their pedagogical development.

## **2.7 Chapter summary.**

This chapter is a scene setting chapter, establishing the background to the emergence of digital skills as a set of defined capabilities and ultimately as a core element of academic staff development. The key political drivers and sector-wide membership body roles in this are discussed in order to show how higher education institutions have been strongly encouraged to include and, in some cases, prioritise the development of digital skills of staff (and students). Additionally in more recent years there has been an emphasis on developing a more joined-up

approach to the development of these digital skills for academic staff as part of wider educational development activities through the mapping of digital on to established professional development frameworks. This chapter also provides an overview of the institutional context within which this study's participants work. It establishes the role on CLT in achieving goals and ambitions set out in their digital education strategy and how their model of bringing together the digital skills development as part of a more holistic professional development approach for academic staff was the driver for the HEI where this study is based and subsequently led to identifying and selecting the Technological, Pedagogical and Content Knowledge (TPACK) framework as a basis for its academic staff educational development model. So, this chapter has set the scene from within which the context of this phenomenon and thesis takes place and the next chapter (3) details the phenomenon through which participants have experienced TPACK with chapter four then providing a detailed literature review of the TPACK framework, its development and emergence as a framework for teacher education and further examine its role in the context of professional development of academic staff, towards a more integrated approach to digital skills development, in the same way that TPACK has been used to more effectively integrate the digital skills development of (pre-service) teachers.

## **Chapter 3: Review of Literature on the TPACK framework.**

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### **3.1 Introduction.**

Whilst Chapter Two provides the background to the emergence of “digital skills” (in essence a review of digital literacy as a component of academic staff development) the core focus of this study is to examine the experience of academic staff using TPACK as a framework in the context of their academic development. Therefore, the purpose of this chapter is to present the research literature that specifically relates to the TPACK framework, so that it may be possible to understand the origins and development of the Technology, Pedagogy and Content Knowledge (TPACK) framework itself, but also as a potential model for academic development. Furthermore, this chapter will explore the application of that framework in the context of educational development in global higher education settings. Analysing existing experiences and studies relating to TPACK will help us to both understand the framework’s use in the broadest range of applications and more specifically identify the experiences of others in relation to these implementations, which will be of use to us in the context of this thesis.

In the first part of this chapter I will discuss the literature associated with the development and emergence of the TPACK framework, this being the framework upon which the phenomenon being experienced by participants of this study is based. This will help us to understand the key features of the framework, its original intended purpose and the rationale for its original development. In the second section I will then present and discuss a range of TPACK informed research so that it is possible to understand how TPACK has been used as a theoretical framework in a range of research settings. In the third section I will then specifically draw upon a number of studies which make use of the framework for educational development across a broad spectrum of educational settings in order that it is possible to understand how TPACK has been applied in the context of the professional development of teaching staff in those various settings.

In the final section of this chapter the focus will more specifically be on the use of the TPACK framework in a Higher Education context, so that it is possible to more clearly draw upon these experiences in order to provide us with a critical perspective against which to make comparisons with this study and ultimately identify gaps in research relating to TPACK use as a rationale for this study.

### **3.2 The emergence of TPACK as a theoretical framework.**

Extending Shulman's seminal work on the "conceptions of teacher knowledge" (Lee S. Shulman, 1986, p. 4) and his development of the pedagogical and content knowledge domains (PCK). The TPACK (originally TPCK) framework (Mishra & Koehler, 2006) was developed to expand on Schulman's framework to include the 'technological' domain, thus drawing upon research into "the phenomenon of teachers integrating technology into their pedagogy." (2006, p. 1017).

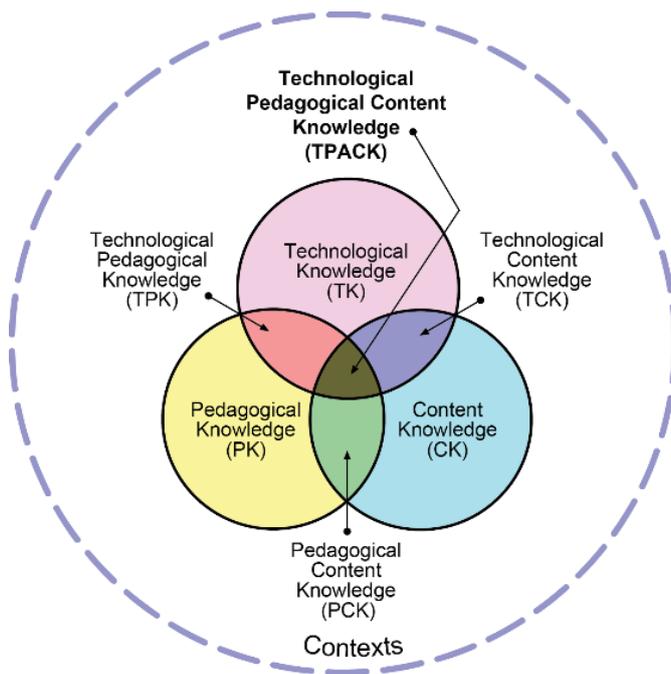
Mishra & Koehler argued that the lack of consideration for technological integration was in part due to the way in which educational technology research was conducted, largely through case study activity, and that "merely introducing technology to the educational process is not enough." (2006, p. 1018). In particular the emphasis of the technological element is more than just the consideration of the 'tools' (interactive white boards, tablet devices, video, audio, augmented/virtual reality, polling systems etc) but the relationships of those tools on the content itself and also the pedagogical approaches, "this is the teachers' ability to select the best technology tool to effectively teach a concept" (George, 2014, p. 5).

The TPACK framework emerged through a number of '*design experiments*' undertaken by Mishra and Koehler over a five-year period and refers to the interplay of three core knowledge domains. (Figure. 2).

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- Pedagogical Knowledge (PK) – the knowledge that a teacher has relating to the understanding of learning and teaching (including teaching methods, curriculum design, assessment and feedback, learning activities).
- Technological Knowledge (TK) – the awareness and knowledge of the use of digital & analogue tools and services (technologies) in the design and delivery of learning & teaching.
- Content Knowledge (CK) – the knowledge that a teacher has of their subject(s) (appropriate to their level of teaching) and the relationship of that subject with other discipline areas.

**Figure 2** - Venn diagram of TPACK Framework.



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In addition to these three core domains are the overlapping sub-domains of PCK, TPK and TCK and it is this interplay of domains that underpins the TPACK philosophy in so much as the domains do not sit in isolation but are intertwined and are additionally considered collectively in

the wider educational context (as indicated by the often-neglected dotted line which encircles the model).

Kelly (2008), describes the context as:

*“the physical features of the classroom; the demographic characteristics of students and teachers; the cognitive, experiential, physical, social and psychological characteristics of students and teacher, and teacher knowledge, skills and dispositions” (p. 5258).*

The intention of the TPACK framework was to both support the transformation of teacher education and also provide a framework through which further research could be undertaken (Mishra & Koehler, 2006) in this way the framework could be used as a tool for practical support and application activities and also as a theoretical framework to underpin research related to it.

In particular, TPACK has “provided a means for educational technology researchers and practitioners to communicate more accurately and effectively about the work they are doing.” (Baran et al., 2011, p. 376) and therefore opportunities for comparisons to be made between studies that use TPACK as the underpinning framework for the research.

The next section provides more detail of the various ways in which TPACK has been used in educational (technology enhanced) research.

### **3.3 TPACK in the context of educational research.**

The research relating to TPACK has seen a steady growth since its inception. A 2011 limited database review of TPACK literature reports a growth in research from one single article in 2003 to twenty-six articles in 2010 (Chai et al., 2013), the majority of which (65%) were from North America.

A 2013 study reviewing TPACK related empirical studies also shows a dramatic increase in published studies using TPACK since 2009 (Wu, 2013). This study also indicated that of all the

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TPACK journal articles accessible through the Social Science Citation Index (SSCI), relating to education, and published 2002 to 2011, 54.2% were related to pre-service teacher development, 20.8% of the studies were focussed on high school teachers, 16.7% elementary school teachers and 8% of the studies were in a college or university context. The TPACK Newsletter has also recorded some publications of TPACK related materials since its first publication in 2009 and as of May, 2019 has published the following statistics; published articles (1054), chapters (286), books (28) and dissertations (336), (School of Education at the College of William & Mary, 2019) and includes a special edition journal focussed entirely on the use of the TPACK framework in a range of educational research contexts (Harris et al., 2017). A simple Google Scholar search (February, 2019) lists 25,800 results for the term “TPACK” and 10,500 of those since 2015, suggesting that there has been exponential growth of TPACK related research in the last few years.

As indicated above, research using TPACK is predominantly based on studies in North America, but a more recent expansion of TPACK has seen it being translated into other languages and used as a research framework for studies across the globe with specific examples in China and Taiwan (Baran et al., 2011), India (Beri & Sharma, 2019), Australia and Israel (Redmond & Peled, 2018) and a single study working across six countries (Bhutan, Denmark, Estonia, France, Malaysia, and Pakistan) using TPACK for pre-service teacher training self-assessment (Castéra et al., 2020).

Between 2011 and 2018 there have been five literature reviews specifically focussed on TPACK which provide clear evidence of the expansion of TPACK related research and provides an insight into how research relating to TPACK has evolved over time.

The earliest of these reviews focusses on the use of TPACK in the context of preservice teacher training and development (Abbitt, 2011) and whilst initially identifying 91 full text accessible studies the author narrows this to 33 studies relating more specifically to focus on the use of

TPACK in the context of preservice teacher development. One notable observation in this literature review was the reference to the 'Survey of Preservice Teachers' Knowledge of Teaching and Technology' (Schmidt et al., 2009) which is entirely based on TPACK and itself has been widely published and contributed to a number of studies within the review (Abbitt, 2011). This review positions TPACK as both a framework for the design of preservice teacher development but also as a tool for evaluation of knowledge in relation to the framework domains.

The second of these literature reviews titled 'How Do We Measure TPACK? Let Me Count the Ways' (Matthew J. Koehler et al., 2011) features as a chapter in a book exploring frameworks and approaches to educational technology impact in the classroom (Ronau et al., 2011) and seeks to identify empirical studies that use TPACK as a basis for knowledge development and ways in which this might be measured. After initially identifying 303 articles it ultimately draws upon 66 studies which met the criteria for inclusion. The study focussed on studies between 2006 (the year of the seminal paper on TPACK) and June 2010 but showed a significant year on year percentage increase on TPACK related research publications with 5% of publications coming from 2006 and 42% of studies from 2009. From these studies 141 instruments for measuring TPACK were identified and then categorised into five areas (self-reporting measures, open-ended questionnaires, assessments of performance, interviews and observations). Their focus for this literature review was to "provide a comprehensive account of TPACK measures in a systematic manner" as well as consider the reliability and validity of each and again there is particular reference made to the use of TPACK in pre-service teacher development. It is perhaps useful to note that the authors of that chapter are also the key authors of the TPACK framework itself and within this chapter they refer to TPACK as a framework which "functions as a "conceptual lens" through which one views educational technology" (Koehler et al., 2011, p. 17). This supports the

earlier section which proposes that TPACK was developed for both practical and theoretical application.

The third literature review examines studies relating to ICT integration in a school setting where TPACK has been used to support the development of teachers. It reviews 74 journal articles and, as in the previous review, demonstrates growth in publications relating to TPACK (from three articles in 2006 to twenty-six articles in 2010). Additionally, it supports the previously indicated proposition that the majority of studies are conducted in North America (65%) (Chai et al., 2013).

The fourth literature review published in 2013 drew upon 55 peer-reviewed journal articles and a single book chapter that were themselves published between 2005 and 2011. It summarises that TPACK is both applied in practical and theoretical contexts as presented in the second literature review above. More specifically though it presents the view that in a practical setting TPACK is “an intuitive and easy-to-communicate concept” (Voogt et al., 2013, p. 118). However, as a theoretical construct it is often considered “a very complex concept and causes scholarly debate” (2013, p. 119). This is perhaps not surprising given the date of this publication and the still emerging TPACK related research. The literature review proposes that if the framework is to be used as a “knowledge base for teacher” then it is important to understand in more detail what that is for specific subject areas.

The fifth literature review focusses specifically on TPACK in the context of preservice teachers and their TPACK development. In total four of the five literature reviews refer to TPACK in the context of preservice teacher development and it remains the dominant domain within which TPACK related research is carried out. This 2018 publication initially identified 501 potential articles of which 88 met the inclusion criteria for review. The review utilised the five categories for research data collection that were identified in the second literature review above, these being self-report, open-ended questionnaire, performance assessments, interviews, and

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observations. As with that other review the use of self-reporting was highest (47% of studies) whilst the use of more qualitative approaches were lowest with interviews only being used in 14% of the studies, although the authors noted that there was an increased use of mixed methods approaches in TPACK related research (Wang et al., 2018).

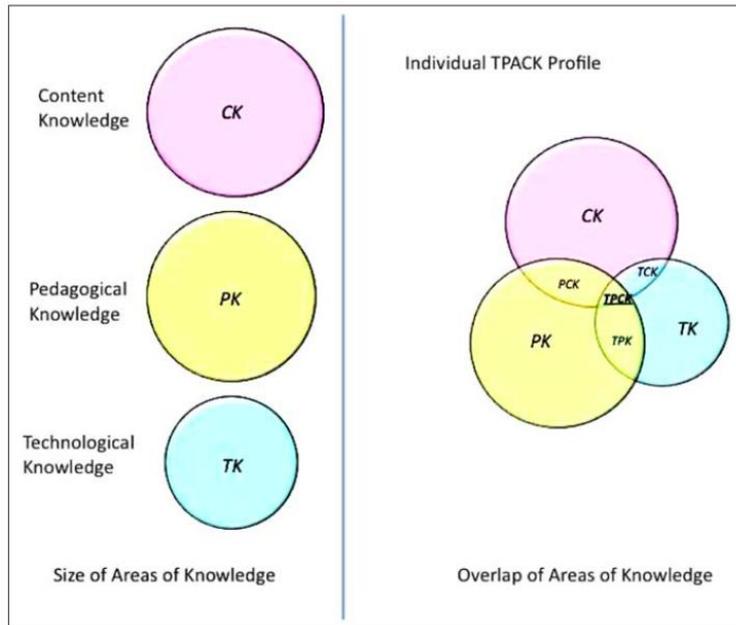
Through these literature reviews it is evidential that TPACK related research is a growth area and is having a significant impact on understanding preservice teacher development, particularly in North America.

*“The interest of using TPACK framework and the TPACK survey for designing and assessing teacher knowledge in various international teacher education contexts is a clear indication of the world wide impact of TPACK as an emerging research and development tool for teacher educators.” (Baran et al., 2011, p. 375).*

This supports the notion that TPACK has also started to have a “profound impact on the field of educational technology” (Cox & Graham, 2009, p. 60) and continues to be an important framework in the support of digital development of teachers.

However, there is still a limited number studies using TPACK which take place in higher education and although there is an emerging body of research into the use of TPACK in higher education (Baran et al., 2011; Morsink et al., 2011; Stover & Veres, 2013) where it does exist in some cases it has shown that when academic staff can map and articulate their understanding of the TPACK domains and their integration of them they are more likely to consider their development needs across all three domain areas (Benson & Ward, 2013) (see Figure 1).

**Figure 3 - Individual Mapping Profile of Participant using TPACK**



Note. From Benson, S. N. K., & Ward, C. L. (2013) p. 168. Teaching with technology: Using TPACK to understand teaching expertise in online higher education. *Journal of Educational Computing Research*, 48(2), 153–172. <https://doi.org/10.2190/EC.48.2.c>

So whilst it is clear from the literature reviews above that the growth of TPACK as a specific framework for the development of teachers has expanded rapidly, particularly in pre-service teacher education, there is significantly less evidence of TPACK being used in higher education settings for educational development. In the next section I will specially focus on reviewing literature related to the use of TPACK in higher education settings and more specially in the area of academic professional development.

### **3.4 TPACK for academic development in Higher Education.**

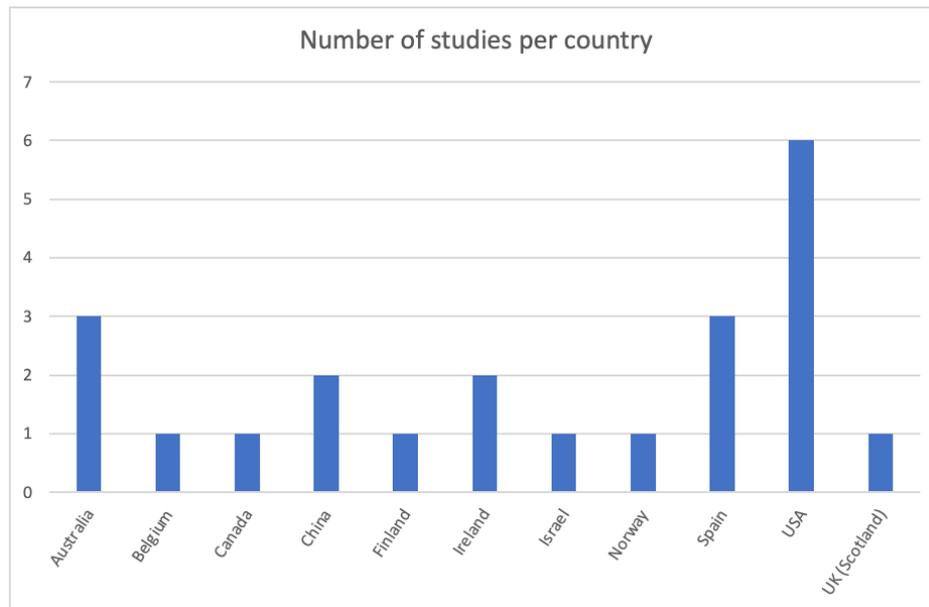
In this sub-section I will examine the use of TPACK within the context of higher education. I will explore the various uses of the TPACK framework, providing examples of studies so as to understand the extent to which TPACK has been increasingly used to examine technology use and related digital development of staff in higher education contexts. I will specifically draw upon research that uses the framework in the area of academic development, so that I may frame this thesis within the directly comparative context of previous studies.

In the previous section I have discussed the use of TPACK in a range of settings, particularly that of teacher development. As stated in the research problem this thesis will specifically examine the use of TPACK in the context of the professional development of academic staff. From my own database searches (up to 2020) and also as evidenced by other literature reviews on TPACK use (Voogt et al., 2013) and (Dewi et al., 2021) the majority of studies into TPACK are in relation to pre-service teacher training with no identified use of TPACK as a professional development framework for academic staff in the UK that I was able to source. This is supported by other TPACK studies in which they found that there were “very few references to university lecturers’ TPACK and the integration of ICT in tertiary institutions” (Jaikaran-Doe & Doe, 2015). However, there are a some key studies which make use of TPACK as both a research framework in higher education (Benson & Ward, 2013; Glowatz & O’Brien, 2015, 2017b; Goradia, 2018; Maor, 2016) and more specifically some studies in the use of TPACK specifically relating to professional development (Brouwer et al., 2013; Dysart & Weckerle, 2015; Stover & Veres, 2013). A search in the Lancaster University “OneSearch” facility in October 2019 for articles since 2006 (the year in which the seminal paper on TPACK was published) resulted in 788 journal articles being identified across all the accessible databases using the search terms TPACK, TPCK (as it was originally known) and ‘technological pedagogical content knowledge’ including additional search terms of ‘higher education’, ‘university’ and ‘HEI’. Subsequent analysis indicated that a significant

number of these papers were specifically related to online education, rather than campus based, and so papers relating to the use of TPACK in higher education online delivery were excluded, as the context of this study is examining the lived experiences of academic staff who work entirely in an on campus face-to-face setting.

As a result, there were 195 English language articles, and an initial review of abstracts identified that a number of these articles were in fact specifically related to pre-service teacher training programmes being delivered in a Higher Education setting. Therefore, any articles with “pre-service teacher” in any field were also removed, resulting in 59 articles. Further analysis of the abstracts of these articles resulted in 21 articles which met the criteria, those being specifically related to the use of TPACK in the development of Higher Education staff (Faculty). Additionally, one other article was included having been identified in one of the published papers and sourced through Google Scholar and so these 22 publications provide the basis for this focussed section of the literature review. It is useful to note that only thirteen of these articles were tagged or categorised as “Professional Development” in the database searches, which indicates that some of the articles were not specifically published as professional development research articles even though they do in fact include elements relating to the development of staff and were therefore included. Additionally, in comparison to the wider research relating to TPACK, which was dominated by North American studies, when the focus is narrowed to higher education settings for professional development this was more globally representative. Although still very much dominated by studies from North America, there are also studies emerging from China, Israel and Brazil and indicates an expansion of the TPACK framework beyond its US origins (Figure 3).

**Figure 4** - Number of studies per country.



Note. This chart shows the number of studies identified per country, based on where the study took place, not the country from which the study was subsequently published.

What this process highlighted was that although the TPACK framework itself is well established as a conceptual framework, its use in a Higher Education research setting, specifically within an on-campus context with regards to the development of academic staff, is extremely limited in comparison to other areas. Additionally, there was no evidence of any studies using TPACK for as a professional development framework in any higher education institutions in England. Although the UK is represented through a single study in Scotland, they operate a devolved education system which is different to English institutions. This shows that there is clearly a gap in the research exploring the experience of academic staff using TPACK as a framework for academic professional development, which this thesis will begin to address.

In the previous section I presented the wider literature around how TPACK has been used and in particular its prevalent use in the context of pre-service teacher development and more specifically as a basis for assessing the competency of (pre-service) teachers through the development of competency assessment tools such as the Survey of Preservice Teachers'

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Knowledge of Teaching and Technology (Schmidt et al., 2009), a TPACK self-assessment survey for teaching English as a foreign language (TPACK-EFL) and additionally the literature review in which identified that out of the 88 studies they reviewed 42 of them specifically used a self-reporting survey tool as a method for collecting pre-service teacher TPACK competency (Wang et al., 2018).

Therefore, it is perhaps unsurprising that within this more focussed literature review TPACK was often used as a framework for the development of an instrument for measuring the competency of staff (Almerich et al., 2016; Barac et al., 2017; Baya'a & Daher, 2015; Cubeles & Riu, 2018; Jaikaran-Doe & Doe, 2015). Of the 23 articles identified for this literature review 15 of them (65%) used a TPACK influenced survey as a data collection method, including the adaptation of the freely available Survey of Preservice Teachers' Knowledge of Teaching and Technology for use in a higher education context with the need for terminology changes and a reduction in questions related to Content Knowledge (CK) (Barac et al., 2017).

As already discussed in the previous chapter, this approach is predicated on the desire to identify staff competency, specifically in relation to the digital skills of academic staff and that a lack of development for academic staff with teaching duties is a "significant stumbling block" for this effective integration of technology (Shih & Chuang, 2013). In their paper, Shih & Chuang extend this notion of TPACK developed surveys to uniquely use TPACK as a theoretical framework from which to develop an instrument (survey) through which it would then be possible to assess "students' perceptions of faculty knowledge (SPFK)" in relation to the TPACK domains. This not only positions TPACK as a framework for the development of staff but extends this into the potential for it to be used to evaluate the effectiveness of any staff development from the perspective of the student learning experience. Findings from this research further supports the notion previously discussed in Chapter 2 that digital skills development are integral to supporting

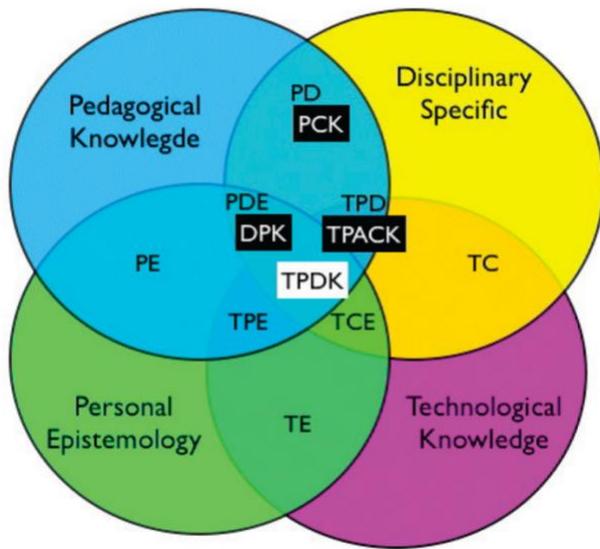
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changes in pedagogical practice and that “the mere presence of technological knowledge does not guarantee good teaching as perceived by students” (Shih & Chuang, 2013, p. 115) and therefore the holistic approach emphasised by TPACK is of particular importance in the wider approach to academic staff development with Shih & Chuang concluding that “Results of such surveys inform how faculty can advance in their teaching practice and better address the issue of faculty professional development in the digital age.” (p. 116).

In her paper titled ‘TPDK, a New Definition of the TPACK Model for a University Setting’ Bachy (2014) draws upon a number of additional theoretical models alongside TPACK to propose TPDK (Figure 3) suggesting that in the context of a University setting a “teacher’s effectiveness” should be measured from four perspectives:

- Disciplinary Knowledge (D)
- Personal Epistemology (E)
- Pedagogical Knowledge (P)
- Technological Knowledge (T)

**Figure 5** - Venn diagram of Technology, Pedagogy, Discipline Knowledge (TPDK) model



Note. From Bachy, S. (2014). Tpdk, a New Definition of the Tpack Model for a University Setting. *European Journal of Open, Distance and E-Learning*, 17(2), 15–39.

<https://doi.org/10.2478/eurodl-2014-0017>

The paper acknowledges that the whilst the model and subsequent validation tests theoretically showed encouraging results, the true test of success will need to be assessed from its practical implementation in a staff development context and that revisions will likely be needed (particularly with regards to the discipline-epistemology relationship). I could find no further studies on the use of TPDK in any setting and subsequent studies have additionally shown that TPACK has been successfully utilised as a framework in University settings (see (Barac et al., 2017; Cubeles & Riu, 2018; Jaikaran-Doe & Doe, 2015; Marcelo & Yot-Domínguez, n.d.; Sointu. et al., 2019) therefore leading me to conclude that TPACK is both relevant and applicable for use in a higher education setting.

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A 2015 Canadian study is one of the first to apply TPACK in the context of developing the digital skills knowledge of academic staff specifically through a TPACK influenced workshop and additionally, an associated community and mentor model. Consistent with my own research, as presented through the earlier sections of this literature review, the effective adoption of technology by 'faculty' often faces a number of hurdles including a lack of time, a preference for things to stay as they are, a focus on subject expertise rather than technological and a lack of perceived institutional support (Jaipal-Jamani et al., 2015). However, the use of a TPACK influenced workshop and dialogic model in that study resulted in the effective transition of TPACK as a theoretical framework into practical changes in the use of digital tools as part of teaching by the academic staff. In particular the use of group based study and mentoring approaches as part of the activity helped staff to make sense of the framework and its application .

“Participants, being involved as both learners and researchers, supported each other in the development of the technical and pedagogical skills necessary for technology enhanced teaching and engaged in narrative documentation of their changing teaching practices.” (2015, p. 41).

This collaborative approach, which influenced my own TPACK workshop design as part of this study (discussed in more detail in a subsequent chapter), showed that this development approach using the TPACK framework as a workshop and conversational framework led to changes in technology use in the teaching practice and that with individual agency it also “promoted the development of knowledge about technology-enhanced teaching (TPACK) and the transfer of that knowledge into practical classroom applications” (2015, p. 42).

In his study Mourlam (2017) also highlights the need to give staff agency and context. He suggested that TPACK as a development framework helps to overcome the “technocentrism” often experienced by staff in relation to their digital skills development. In his semester long

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study he found that the holistic and personalised nature of the development allowed academic staff to make use of the framework beyond the workshop itself and that as such “for successful technology integration to occur, it must be approached where technological affordances are considered within the contextual bounds of the course content and instructional approach.”

(2017, p. 20). Additionally, he concludes that a TPACK influenced development model for academic staff will help improve their overall digital skills development and move away from the “one shot”, “technocentric” digital skills development experiences which are less effective for long term change and do not encourage the interplay of the content, pedagogy and technology. This emerging notion of TPACK as a framework to support giving increased agency to academic staff in relation to their digital development is explored in greater detail in a 2018 PhD study which specifically examined the experiences of academic staff with regards to their use of technology in the classroom and their development of it. The study further supports the idea that individualised development programmes are more effective at building confidence in the use of technology for learning and teaching activities than group based development (Merritt, 2018). However, where group training exists it should use the TPACK framework as a reference point. “Without training that builds TCK, develops PCK, and helps utilize the technology into the classroom designs (TPK), true technology integration and utilization will not occur (TPACK).” (Merritt, 2018, p. 115).

Despite these examples of TPACK as an academic development framework it is still the case that the majority of the most recent studies identified as part of this literature review are using TPACK as a research framework, to explore the experiences and/or effectiveness of technology related development in a higher education setting, see (Cai et al., 2019; Clausen et al., 2019; Mei et al., 2019; Sointu. et al., 2019). This adds further support to the that fact that through this PhD my own research is helping to fill a much under-researched area in understanding how effective

TPACK might be as an institutional framework for academic development and staff experiences of that.

### **3.5 Critics of TPACK.**

Although the majority of TPACK related research focusses on the development or use of the framework in a positive way, it is important to highlight that there is some criticism of it. One assertion is that the framework is not defined well enough and therefore not able to fully understood (Angeli & Valanides, 2009). The argument presented is that this limits the effectiveness of the framework because domain definitions are not clearly agreed and as such the development of an 'elaborated' TPACK model is required in order to clarify the sub domain boundaries for the purpose of undertaking future studies of TPACK in practice (Cox & Graham, 2009). One paper specifically calls out TPACK for its reductionist approach to Shulman's original concepts (Cherner & Smith, 2017) suggesting that in the content knowledge area Koehler and Mishra have in fact narrowed the original definition. However, in subsequent papers Koehler and Mishra address these criticisms by arguing that the TPACK domain definitions and the overall framework are purposefully open to variation and interpretation in order to offer scope for local optionality and inherent flexibility which offers "several possibilities for promoting research in teacher education, teacher professional development, and teachers' use of technology" (M. J. Koehler & Mishra, 2009, p. 67). The intention of the framework is not to be so prescriptive that it cannot be applied to the broad range of contexts (signified by the dotted line round the domains (Figure 1)) that it has been.

In the context of this study I would agree that the broad nature of the TPACK definitions has increased the accessibility of it for the purpose of academic development with staff from a range of subject areas, something which is explored in more detail in both the methodology and discussion sections. So, for the purpose of the development activity and subsequently this study I

have retained the original broad definitions of the TPACK domains (and sub domains) as set out in the original framework's seminal publication and as presented in the earlier sub-section and summarised below:

Content Knowledge: This being the subject matter being taught (whether that be a broad discipline or a particular topic within that discipline) – this is the 'what' is being taught.

Pedagogical Knowledge: This refers to the learning and teaching approaches being used to support student learning and assessment - this is the 'how' is the subject being taught.

Technological Knowledge: This relates to the use of tools (analogue and digital) and resources which are used in the process of learning and teaching. Within the context of this study there is a particular emphasis on the use of digital tools, although some participants referred to specific specialist (non-digital) equipment.

### **3.6 Chapter summary.**

The chapter examines the development and implementation of TPACK (Technological Pedagogical Content Knowledge) as a theoretical framework in education. The first section outlines the emergence of TPACK as a framework, tracing its roots and evolution from a framework for pre-service teachers towards a framework for more broadly examining technology integration in learning and teaching activities. The second section then focuses on the use of TPACK as a framework for educational research, highlighting its applications in various educational settings and its impact on educational practice and the way in which it has become a framework for research activity, not just for learning and teaching activities.

The third section explores TPACK specifically as a framework for academic development in Higher Education, specifically examining how it can be used to support faculty in their integration of technology into their teaching practices, but noting the very limited literature available in this area. Finally, the chapter examines the criticisms of TPACK, exploring the limitations and

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challenges faced by those who use the framework in their work and the views of those who may not consider TPACK to be an effective (theoretical) framework. Overall, the chapter provides an overview of TPACK as a theoretical framework in education and its potential for promoting the integration of technology in teaching and learning and its use in the context of higher education.

Through chapter two I have been able to establish the broader historical from which the emergence of digital skills as an area for professional development was derived. Chapter four will therefore additionally detail the local context of the phenomenon within which this digital skills development has been considered and within which this research takes place so that the reader may better understand that phenomenon being experienced.

## **Chapter 4: Understanding the phenomenon.**

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### **4.1 Introduction.**

In a previous chapter I established the emergence of digital skills as being increasingly necessary for academic staff and the associated development of them in relation to the broader direction of travel of the UK higher education sector, as well as a brief overview of the institutional context within which this research takes place and in the chapter preceding this one I presented the detailed literature review related to TPACK, both of which provide the underpinning knowledge from which to understand the phenomenon being experienced.

Therefore, in this chapter I present, in more detail, that institutional context and additionally the use of the TPACK framework as a core element of the intervention which staff experienced. The use of TPACK, and the associated activities described within this chapter, are a direct response by the institution, where this study takes place, to address the emerging sector-wide identification of the need for effective digital skills development of academic staff. As briefly mentioned in a previous chapter, I will be using phenomenography as the methodology, this is the process of mapping “the qualitatively different ways in which people experience, conceptualise, perceive, and understand various aspects of, and various phenomena in, the world around them” (Marton, 1986, p. 31) and in the context of this study the phenomena experienced is one which is local to the institution and as such may not be broadly understood by the reader. Therefore, it is necessary to provide a more detailed overview of the context within which academic staff who participated in this study have experienced the use of TPACK as part of an holistic academic development programme. The TPACK framework had been recently (12 months prior to the start of this study) introduced by the academic development unit at this Post-92 University in the United Kingdom (UK), and this study seeks to understand the experiences of academic staff in relation to that implementation, in order to inform future considerations and development for TPACKs use. It is therefore useful to more specifically describe the way in which TPACK has been

used in this context for staff development and subsequently examine the way in which staff experience TPACK as part of their academic development.

## **4.2 The TPACK Intervention**

The rationale for implementing TPACK stemmed from an observation that the development of staff digital skills within this higher education institution (HEI) was often perceived as a low priority and yet the newly introduced digital education strategy set out the vision to “support the development of staff to become confident and capable users of digital tools for learning and teaching” and as such a development programme was needed to fulfil this ambition, and was the strategic driver for the workshop design. As described previously in Chapter 3, TPACK has been used extensively and effectively as a framework for teacher education and as other studies have presented “TPACK model learning can be used as the best tool through which teachers can acquire the way to incorporate technology in the digital years” (Su, 2023, p. 2) and so the institution sought to apply the use of TPACK in a Higher Education setting.

Additionally, the workshop design was influenced by key sector reports such as The Universities and Colleges Information Systems Association (UCISA) survey which had consistently identified ‘time’ was a key limiting factor for staff in not engaging with their digital skills development. The 2017 survey stated that “Lack of time remains the leading barrier to TEL development, consolidating its position at the top of the list which it has held since the 2005 Survey” (Voce et al., 2016, p. 1). Therefore, the approach taken for this academic development was to recognise that only a finite amount of time was available for an individual’s development activity and to therefore encourage academic colleagues to more consciously allocate some of that time for technology enhanced learning (TEL) development, through the introduction of the TPACK framework as a mechanism for this. The core use of TPACK in relation to the professional development of academic staff is centred around a 90 minute workshop developed and run by

the institution's Centre for Learning and Teaching (CLT), additionally supported by pre and post workshop activities. The underlying philosophy for the design of the development intervention (centred around the workshop) is based around the principles of the 'Flipped Classroom' model which encourages learners to be active in their participation and learning structured around a pre-class, in-class and post-class model of design (Prust et al., 2015). In the context of this development this is presented as pre-workshop, workshop and post-workshop. Each component of that process is described in more detail below in order to provide the reader with the institutional context through which the experiences examined in this thesis are derived. It should be noted that at the time of this study it was not a requirement for academic staff to engage in this development process and so all participants in the workshop were self-selecting volunteers, seeking to develop their digital skills who signed up through the Centre for Learning and Teaching online development programme booking. A few months after the workshop and associated activities had been completed those participants were then invited to join this study (as described in the next Chapter).

### **4.3 Pre-workshop.**

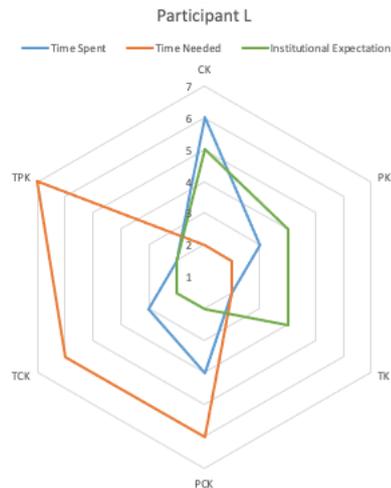
In line with the flipped classroom approach participants are asked to engage in a pre-session task or activity. This pre-session activity can be a combination of instructional materials, mini assessment tasks, discussion or information gathering (Di Mella, 2020) but is designed to prepare learners for the teaching session (workshop). For the TPACK designed development the pre-workshop task was designed to firstly introduce the staff to the TPACK framework and secondly to gain insights into their academic development experiences within the context of the institution. Prior to the workshop staff are provided with a number of resources which provide an overview of the TPACK framework, including videos and online information which explains the domains and sub-domains of the TPACK framework. Participants are then required to complete a short survey which asks them the following questions:

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1. On a scale of 1-7 (1 being the least and 7 being the most) please identify where your academic professional development time currently being spent in relation to the TPACK domains.
2. On a scale of 1-7 (1 being the least and 7 being the most) please identify where you should be spending most of your academic development time based on areas which need further developing in relation to the TPACK domains.
3. On a scale of 1-7 (1 being the least and 7 being the most) please identify where you understand the institutional expectation for you to spend your development time to be, in relation to the domains of the TPACK framework.

The short survey questions are designed to engage staff in thinking how their academic development activities align with the TPACK framework and the extent to which they are able to map their development activities in relation to 'time' (which we already know from previous literature is the limiting factor). This ensures that all participants have firstly been introduced to the TPACK framework (as it was often a new framework to many participants) and also gives them an opportunity to consider their development in the context of the framework, the time they spend on development and where they spend that time. These individual survey results are displayed as a personal spider diagram for each participant which they receive in advance of attending the workshop but which also forms a part of the workshop discussion, some examples of which are discussed below.

**Figure 6 - Participant L TPACK Survey Analysis**



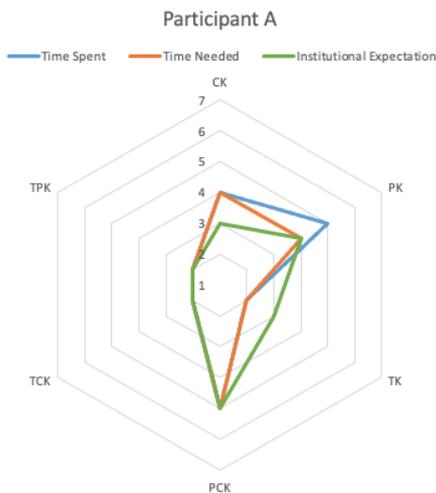
In this first example above, it is possible to see that workshop Participant L has determined that they spend the largest proportion of their time developing their content knowledge (ck), as indicated by the blue line having a value of 6. Additionally, they have identified pedagogic content knowledge (pck) as another area where significant time is spent (4) whilst other domains and sub-domains (particularly technology related) is where the least time is spent (tck = 2, tpk and tk = 1). It is perhaps therefore not surprising that Participant L has also indicated that they need to spend more time (orange line) on developing the technological domain areas (tck = 6, tpk = 7) and also the relationship between content and pedagogy (pck). This suggest that the participant has understood the framework and is self-aware of their own development needs.

Additionally, it would appear from this spider diagram that the institutional expectation (as indicated by the green line) is quite heavily influencing where Participant L is spending their development time with a correlation between the time spent and the institutional expectation. The purpose of this question is to help the Centre for Learning and Teaching better understand the extent to which the expectations of the institution influences the development decisions of academic staff.

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In comparison Participant A (Figure 11) has strongly indicated that pedagogical development is an area where they currently spend a lot of development time, where they still need to spend a large portion of their development time and also where there is a strong institutional expectation for them to spend their development time.

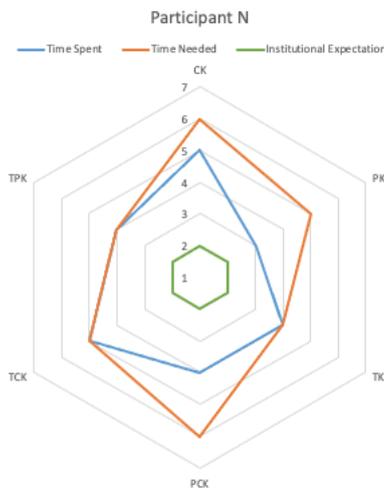
**Figure 7 - Participant A TPACK Survey Analysis**



In particular they consider the pedagogical content knowledge (pck = 5) sub-domain to be a particular area of development for them, both in terms of the development they have already had and development they still need to have. Areas of technological development have almost entirely been disregarded in the context of this survey and so this usefully indicates an area for them to explore with peers as part of the workshop activity. It is also possible to deduce from the spider diagram that the lack of technological development is strongly associated with a lack of perceived institutional expectation and that this participant's development decisions are strongly influenced by institutional expectation.

In relation to the institutional expectation not all participants were able to clearly identify what they considered this to be. For example, Participant N (Figure 12) was able to map their time spent and time needed, but were seemingly unclear about the institutional expectation (or unwilling to indicate this).

**Figure 8 - Participant N TPACK Survey Analysis**



It transpired through the workshop that Participant N felt there was a distinct lack of clear expectation from the institution, hence the recording of the data in this way and that they took a stronger steer from their School rather than their institution. A week prior to the workshop, participants are sent (by email) a reminder copy of their survey spider diagram and of the TPACK framework overview. They are asked to consider if they would make any changes to their diagrams (recognising that the survey they completed represents just a moment in time) and asked to bring those changes with them to the workshop as described in more detail below. Only once participants have completed the survey and received their spider diagrams they are then invited to the related workshop.

#### **4.4 Workshop.**

The ninety-minute workshop is the central component of this TPACK structured academic development intervention. The pre-workshop and post-workshop activities are linked directly to this session, as part of the flipped classroom design. More specifically the workshop, as an activity, supports the broader digital education strategy and is aligned to the digitally integrated academic development approach that was being promoted within the institution for the

purposes of more closely aligning the digital skills development with other pedagogical development activities.

The session itself was predicated on achieving the following objectives:

- Encourage academic staff to think about their academic development holistically (using the TPACK framework as a point of reference).
- More specifically, to begin to explore the integration the of their digital skills / confidence and fluency within their wider academic development.
- Participate in peer-to-peer discussions exploring each other's spider diagrams and reflecting on differing experiences of academic development.
- For participants to identify potential future development opportunities in the context of their identified gaps and needs (using the spider diagrams as a point of reference).
- To produce a draft development plan, mapping this against the TPACK framework to identify potential development activities for the next 3-6 months.

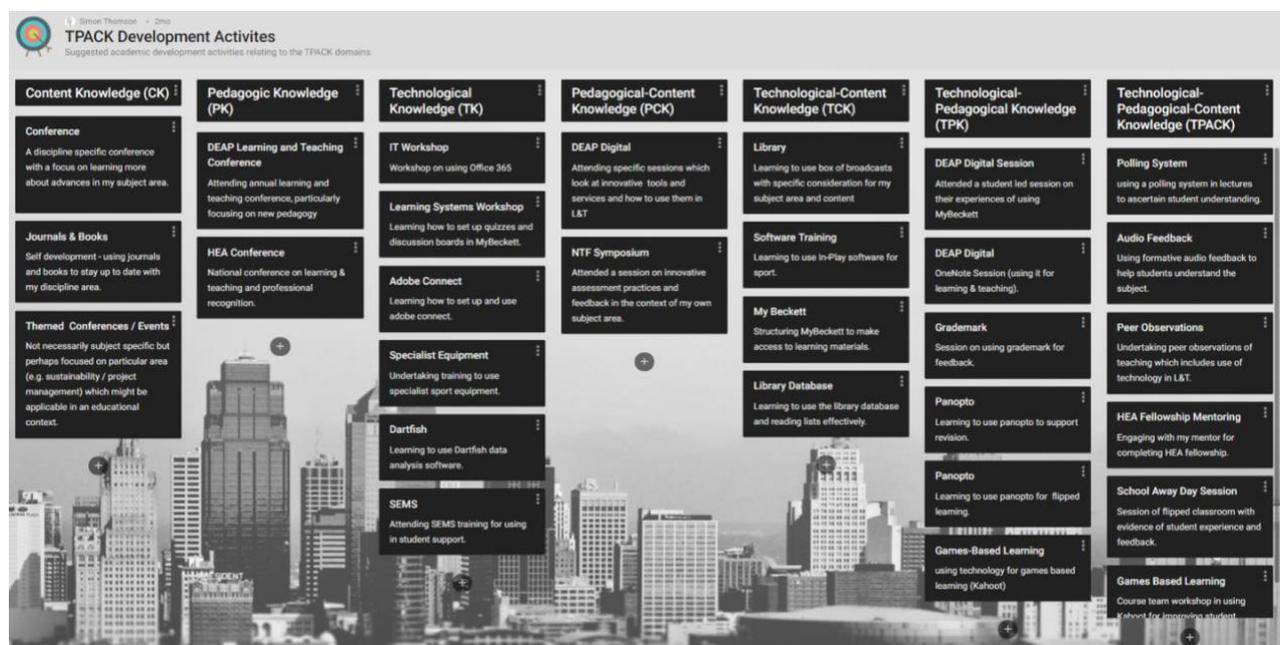
The workshop was facilitated by a member of the team from the Centre for Learning and Teaching who guides participants through a series of structured activities and exercises. Aligned to the flipped classroom approach the workshop is designed around an active learning pedagogy, more specifically discovery-based learning which focusses in the "inner-directness" of the learner and the intrinsic motivation of that learner to deepen their understanding and knowledge through the "reward of discovery" (Bruner, 1961).

The first of these activities is a paired discussion where participants discuss and explore each other's spider diagrams and reflect on their responses to the initial survey questions. Participants are purposefully paired with colleagues from a different discipline area from themselves and where possible from an entirely different school. The purpose of this activity is to share each

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other's individual experiences of academic professional development and to begin to explore ideas for future development opportunities (formal and informal) mapped to the TPACK framework. Participants are then asked to summarise their paired conversations with the rest of the group. These paired conversations and subsequent group sharing are a pre-cursor to a group-wide discussion on the types of development available to them which culminates in a collective group identification of institutional development opportunities that participants are aware of which are then mapped against the TPACK framework as an output (Figure 13). This activity helps raise awareness to all participants of the opportunities available for development that do exist within the institution and outside the institution. It is surprising how many attendees are not aware of internal development available to them and not being aware of the development opportunities or support available is often cited as a reason for not undertaking digital skills development (Fielding et al., 2019).

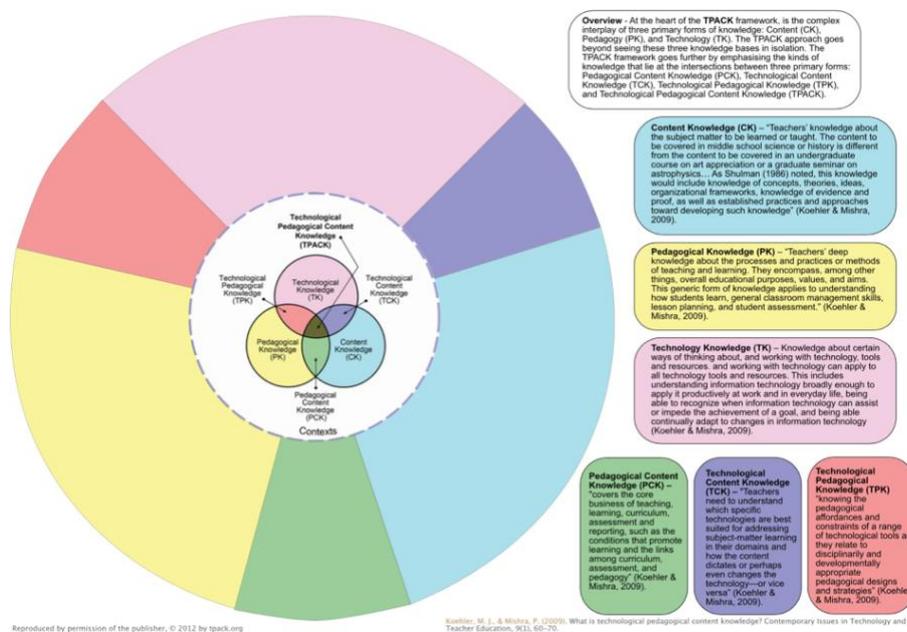
**Figure 9 - TPACK Workshop Mapping Activity (Appendix A)**



The final element of the workshop is the creation of an individual development plan during which participants begin to identify and map their development needs and opportunities against the TPACK framework using a provided template which is printed on A3 paper (Figure 14). This

physical artifact is designed to be “pinned up” in each staff member’s office and act as a point of reference for their development throughout the year where they can continue to add development opportunities as well as indicate any completed development. This direct mapping of development activities to the TPACK framework creates a direct relationship between them having identified where they need to spend developing certain skills and the actual planning of that development.

**Figure 10 - TPACK Development mapping template (Appendix B)**



This facilitated workshop is critical in setting the foundation for the ongoing use of TPACK for professional development planning and recording. It provided participants with the opportunity to not only share experiences of development but more importantly identify opportunities for development which they were not previously aware of and to plan their development going forward.

#### 4.5 Post-workshop.

The post workshop activity builds upon the initial spider diagram and the start of the mapping document to plan development in direct response to the individual staff members needs being identified, whilst also recognising that time is a finite commodity and as such priority should be

given to those areas where they have self-identified the TPACK areas where they need development. For example, Participant L's spider diagram (Figure 10) identified needing to spend time in three TPACK areas, tpk, tck and pck and as such their development requirements should be weighted more to this area in order to close those development gaps. Additionally, there is an opportunity to use this mapping as a mechanism to discuss development needs with a line manager, as was identified by a number of participants during the interview process. Participant C later commented:

*"I think it could be a useful tool for thinking of things like PDRs, where often you'll have a conversation, but it could be a useful guide in those sorts of appraisal situations where you're really thinking about getting a balanced approach to development over the next 12 months."*

This suggests that the use of TPACK as a framework for raising the profile and value of digital development is having an impact beyond the initial survey and workshop activity and that it is featuring as part of a formal review process, albeit still on an adhoc basis. In line with the flipped classroom structure this post-workshop activity is about extending and building upon the knowledge developed in the workshop, revising their development plans and setting out a timetable for future development. Whilst there is no formal requirement for these plans to then be shared again with workshop facilitators a number of attendees do make contact with the facilitators at a later date to review their mapping and additionally a number of attendees subsequently make use of the mapping document as part of the internal AdvanceHE fellowship application process.

#### **4.6 Chapter summary.**

This chapter provides an overview of the context within which the participants have experienced TPACK in relation to their professional development at the HEI where this study is based.

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As detailed in the next chapter, the use of TPACK as a professional development framework has, as far as I have been able to discover, not previously been studied in this way and so this unique context within which TPACK is being used has been presented through this chapter to help the reader more clearly understand the activities that the participants will have engaged in and from which their experiences will be studied through this thesis. As part of this study's interview process participants are asked the extent to which they were aware of TPACK prior to its use as a staff development framework at the institution and only one participant had any prior knowledge of TPACK.

*"I first knew about TPACK around about 2015 and it was from a fellow member of academic staff ..... we were going to support in sessions within primary schools".*

*Participant D*

TPACK is most prevalent in teacher education and it is within this setting that Participant D has themselves previously used TPACK. It can therefore be determined that using TPACK as a framework for the professional development of academic staff is new to all the research participants.

This chapter describes the use of TPACK and the "intervention" design in terms of using flipped classroom as the underpinning philosophy and the associated pre-workshop, workshop and post-workshop activities which clarifies not only the rationale and purpose of the intervention but also provides an insight into the phenomenon being experienced. Importantly this chapter clarifies that the data collected and used as part of the phenomenon are not used as data within this studied and are presented merely to provide context and explanation of the phenomenon. Data for this study is solely derived from the research participants' interviews and subsequent analysis as explained in the next chapters which will set out the research methodology, exploring

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the establishment of phenomenography, its appropriateness for use in this study as well as considerations for alternative methodologies which were considered.

## **Chapter 5: Research Methodology.**

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### **5.1 Introduction.**

This chapter introduces the research approach being used for this study, that being phenomenography. It begins with an outline justification for choosing a qualitative methodology for this research and then extends into the definition of phenomenography itself and its origins. Its philosophical underpinnings are examined and its epistemological and ontological assumptions analysed. Additionally, I draw upon wider literature to give examples of its use within a higher education context and beyond. Later on in the chapter I also explore some of the unique aspects of phenomenography, introduce and explain related terminology and specific elements of its approach. Towards the end of the chapter I compare phenomenography to two other research approaches in order to strengthen the rationale for using this research approach. Please note that this chapter will focus specifically on phenomenography as a research methodology and a rationale for its use. The chapter which follows this will then describe in more detail the context of the study and more specifically phenomenon being experienced by participants. Detailed discussion on the implementation of this research methodology (e.g. specifics of the data collection methods and analysis) will then be presented in chapter six so that the context of the research implementation can be understood in relation to the phenomenon being experienced.

### **5.2 Quantitative vs qualitative methodology.**

Before commencing this study, it was necessary to select the most appropriate methodology and these fall into two main categories. The first of these is quantitative, which concerns itself with using data to “establish statistically significant conclusions” (Lowhorn, 2007, p. 1) and predominantly uses data collection methods which, when analysed, usually results in numerical representation. According to (Goertzen, 2017) quantitative research has six key characteristics and summarised as being an approach which predominantly deals with numbers to assess

information, that this data can be measured and quantified objectively. Subsequently, the findings of quantitative data are evaluated through statistical analysis and represents complex problems through variables from which the results can be summarized, compared, or generalised. In quantitative research, the ontological assumption (the assumptions about the nature of reality that underlie a research methodology) is typically that reality is objective and independent of the observer, and that it can be measured and described using numerical data. The researcher is seen as an objective observer who seeks to understand the underlying patterns and regularities of the phenomenon under study. In quantitative research, the epistemological assumption (assumptions about the nature of knowledge and the relationship between the researcher and the knowledge they generate) is often that knowledge is also objective, universal, and can be discovered through systematic observation and measurement. Researchers aim to generate generalisable and reproducible findings that can be applied to a larger population. In comparison qualitative research “describes an event in its natural setting” (Lowhorn, 2007, p. 3) meaning that it seeks to understand experiences as they are lived and understand behaviours in the context of real life and not using artificial control measures. So whilst quantitative research may seek to prove or disprove an existing theory, qualitative research seeks to propose a theory based on the behaviours and experiences of participants. Therefore quantitative research is said to be “deductive” and qualitative research “inductive” (Soiferman, 2010). Additionally, quantitative research is associated with a positivistic paradigm which “assumes that there is an orderly reality that can be objectively studied” (Moser & Korstjens, 2017, p. 271) whereas qualitative research emerged in opposition to this perspective and is set around the constructivist paradigm, which holds the view that there are multiple ways to interpret the world and the reality of it. Qualitative research is generally based on a constructivist ontology, which assumes that reality is constructed through social interaction and subjective

interpretation. Quantitative research, on the other hand, is generally based on a positivist ontology, which assumes that reality exists independently of social interaction and can be measured objectively. In terms of epistemology, qualitative research emphasizes subjective understanding and interpretation, while quantitative research emphasizes objective measurement and verification. The researcher is seen as an observer who seeks to understand the subjective experiences and meanings that people attach to a phenomenon. As a result, ontological considerations for qualitative research often include the role of the researcher, the situatedness of the research, and the close relationship between the researcher and the researched. In qualitative research, the epistemological assumption is that knowledge is subjective, situated, and constructed through the interaction between the researcher and the people or phenomena being studied. Through qualitative research the aim is to generate rich, nuanced, and context-specific insights into the experiences and meanings of individuals or groups. Qualitative research typically uses a flexible, non-linear design that allows for the exploration of complex phenomena in context. The researcher is often the instrument of data collection, and the data is analysed through coding and thematic analysis. Quantitative research, on the other hand, typically uses a linear, structured design that aims to test specific hypotheses and control for extraneous variables. The data is often collected through surveys or experiments and analysed using statistical methods. Both qualitative and quantitative research approaches have their strengths and weaknesses, and the choice between them often depends on the research question, the nature of the phenomenon being studied, and the preferences and skills of the researcher. Therefore, In the context of this study I am seeking to examine academic staff experiences of using a framework for their academic development and not testing or seeking to prove any existing theory in relation to those experiences which may make use of quantitative methods. A qualitative methodology is therefore more suited to this research, the specifics of which are detailed in this chapter.

### **5.3 Phenomenography.**

#### **5.3.1 Definition.**

In etymological terms, its literal translation from its Greek origins is in two parts. The first being “*phainomenon*” which means appearance and “*graphein*” which means description, and so it literally translates as “description of appearances.” (Orgill, 2012).

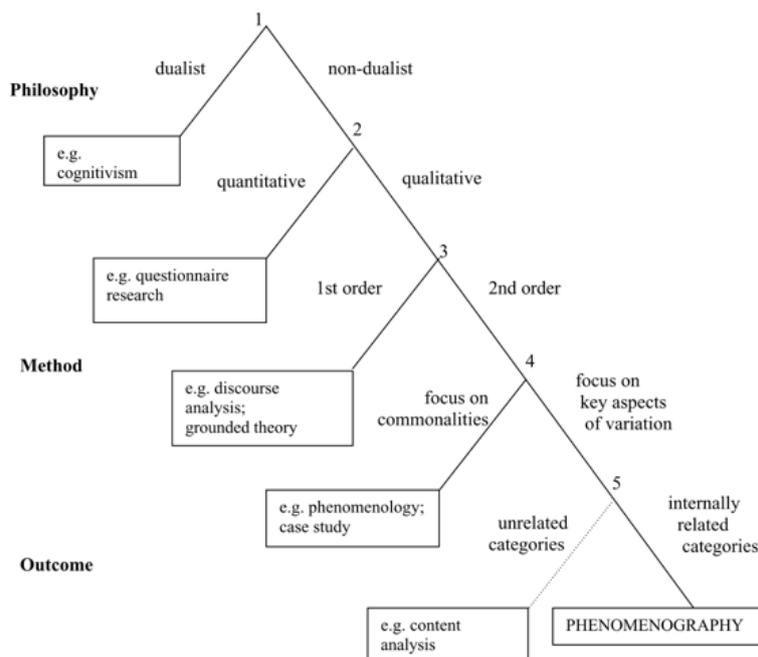
Phenomenography is first formally proposed in a seminal paper in which Ference Marton argues for favouring an approach to understanding experiences of phenomenon through a “second-order perspective” (discussed in further detail later on in this chapter) and more specifically that phenomenography seeks to “find out the different ways in which people experience, interpret, understand, apprehend, perceive or conceptualize various aspects of reality” (Marton, 1981, p. 178). He argues that this approach is complementary to other qualitative research approaches which may seek to “compare groups” or “classify people” in so much that it is not seeking to do either, but is entirely situated around the desire to research the understanding of experiences, “research which is directed towards experiential description” (1981, p. 180).

Phenomenography was born out of research in a higher education context, more specifically examining university students’ (deep versus surface) learning (Marton & Säljö, 1976) and as such has now been used widely in the context of understanding experiences relating to higher education learning (Ashwin & McLean, 2005; Ashworth & Lucas, 1998). What emerged from Marton and Säljö’s process was what they referred to as “outcome space” which defined the different ways in which the students had experienced learning. These resulting outcome spaces form a unique and integral hallmark of phenomenography and are explored in more detail further on in this chapter. Lennart Svensson describes phenomenography as “fundamentally a research orientation” (Svensson, 1997, p. 162) which draws upon some conventional research methods with the aim of “describing conceptions of the surrounding world” (1997, p. 163) but is an alternative to the positivistic, quantitative research of its time and is entirely associated with

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research of an empirical nature (Svensson, 1997). Phenomenographic research seeks to describe the qualitatively different ways in which people make sense of the world around them and more specifically how they experience a range of phenomenon within it (Pang & Marton, 2003) and it is the relationship formed between both the research subject (participants) and the objects (phenomenon) from which representations (outcome space) can be formed (Yates et al., 2012). Trigwell (2006) asserts that phenomenography “takes a relational (or non-dualist) qualitative, second-order perspective, in that it aims to describe the key aspects of the variation of the collective experience of a phenomenon rather than the richness of individual experiences” (2006, p. 368).

**Figure 11 - Defining Phenomenography**

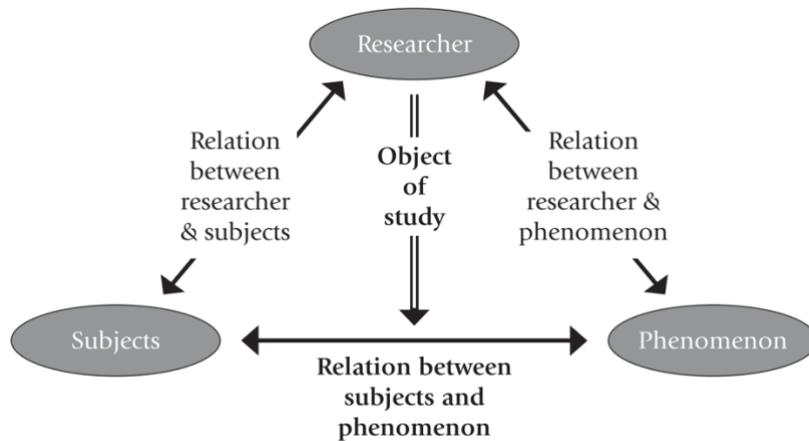


Note. From Trigwell, K. (2006). Phenomenography: An approach to research into geography education. *Journal of geography in higher education*, 30(2), p. 369.

It is this unique second-order, collective experience which sets phenomenography apart from other qualitative methodologies such as phenomenology or grounded theory (both of which are compared later in the chapter). Phenomenographers do not seek to study the reality of our

world (the things in it) but they seek to understand peoples experiences and perceptions of it (Webb, 1997), taking a “relational view of the world” (J. Bowden, 2005, p. 11) within which the researcher is a key component and must be consciously aware of, as represented in Figure 6.

**Figure 12 - Phenomenographic relationality**



Note. From Bowden, J. (2005). Reflections on the phenomenographic team. *Doing Developmental Phenomenography*, 11–31.

A key tenet within phenomenographic studies is that they seek to identify and record variations of experiences and more specifically the finite ways in which these experiences can be categorised. Phenomenographers are therefore seeking to find “the totality of ways in which people experience, or are capable of experiencing, the object of interest and interpret it in terms of distinctly different categories that capture the essence of the variation” (Marton & Booth, 1997, p. 121). Although there are recognisable and well-defined characteristics of phenomenography, in terms of it being an approach to research design, it should be noted that there is variation in the way in which researchers present phenomenography, with it being “referred to as an approach, a depiction, a method, a methodology, a movement, an orientation, a paradigm, a perspective, a position and a programme” (Tight, 2016, p. 321) and in her book chapter Sylvia Edwards goes so far as to say “It is important to note that there is no prescriptive format to conducting phenomenographic research.” (Edwards, 2007, p. 90). Whilst seeking to

differentiate phenomenography from phenomenology Marton (1986) does refer to it as a “research specialisation”, but ultimately he considers it to be a “research approach designed to answer certain questions about thinking and learning” (1986, p. 28). It is phenomenography as a research approach from which this study and thesis have been informed. So, if the intention is to understand and utilise phenomenography it must be accepted that this fluidity is a feature of it, and subsequently seek to ensure that the way in which the research has been conducted is well documented and can be clearly shown to be aligned to the research approach of phenomenography.

Examples of where phenomenography has already been used to examine the experiences of academic staff in relation to their development show that it is an appropriate methodology for this type of research. In their study Prosser and Trigwell (1997) make use of phenomenography as part of the design of a ‘teaching development workshop’, making use of the methodology as part of the workshop in order to help participants inform the design of courses through the experiences of students. It is not uncommon for phenomenography to be used in this way, to understand student learning, but certainly less known for this to be directly applied to academic development situations which uniquely shows “for the first time, participants see that there is a relationship between the qualitatively different ways of lecturing and the qualitatively different ways students will approach their learning.” (Prosser & Trigwell, 1997, p. 51). In her study Åkerland (2005) makes use of phenomenography to move beyond the student experience to study the experiences of academic staff with specific regards to their growth and development. The study is based on the experiences of academic staff at a research intensive university in Australia and makes use of phenomenography to present these experiences through an outcome space of six categories the discussion of which “show substantial variation in ways of understanding academic development, from a focus on the individual academic to a focus

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on the field or society in which they are situated". (Åkerlind, 2005, p. 26). Finally, a study based at the University of Hong Kong used phenomenography to explore academic staff experiences in relation to 'community-based professional development' whereby the participants' variation of experiences were represented through four categories. This study made use of phenomenography in order to better understand the development experience of academics in a very specific content, that being development which is situated around "social engagement through communities and groups, as reflected by a number of increasingly popular concepts: communities of practice, faculty learning communities, and learning and teaching networks." (Zou, 2019, p. 1975) the findings of which it is suggested can be used to help educational developers better understand the effective use of communities for professional development activities. In each of these examples it is possible to see how phenomenography has been used as a methodology for understanding experiences, including those of academic staff and further strengthens the rationale for its use for this study.

#### **5.3.2 Philosophical underpinning.**

Lennart Svensson asserts that phenomenography "makes its own ontological, epistemological and methodological assumptions with inspiration from and similarities to several older and concomitant traditions, without agreeing entirely with any of those" (Svensson, 1997, p. 197). As previously noted he considers it to be a "research orientation" which is aligned to some traditional and well established research methods and approaches but has its own specificity (what Marton (1986) collectively referred to as a research specialism). Although phenomenography may have associations with older traditional research approaches Svensson argues that it has its own "specific foundation and cannot be 'reduced' to phenomenology or any other established school of thought." (1997, p. 163).

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As previously mentioned it is generally accepted that, as a research approach, there is variation in practice with regards to phenomenography (Akerlind, 2005), this in part due to its origins being from an empirical, rather than philosophical or theoretical basis. However, in more recent years there has been increased development of understanding both its ontological and epistemological foundations (J. A. Bowden & Walsh, 2000; Hajar, 2020; Svensson, 1997) as a way of not only establishing it as a methodology in its own right, but also to allay some of the criticisms of phenomenography regarding its lack of philosophical position, which limits its use by some as a legitimate research approach. These criticisms are discussed in more detail in a subsequent section of this chapter.

“Ontology seeks to provide a definitive and exhaustive classification of entities in all spheres of being.” (B. Smith, 2012) and as previously highlighted, ontologically phenomenography positions itself as non-dualist (Trigwell, 2006), a branch which emerged in direct opposition to the dualist ontology of the time which proposes that there exists two entities, firstly the “individual” (person) and secondly the wider “world” within which these individuals exist and that the two should be studied and understood separately. Phenomenography opposes this view and insists that through understanding the (variation of) experiences of phenomenon it is not possible or desirable to divorce the two, as it is precisely the relationship between them that matters (Marton, 2004). This second-order approach (as represented by the right-hand path in Figure 6) puts the emphasis on the experience as it is described by individuals and not on the psychological aspects impacting the experience or on the phenomenon (objects) themselves. “The point of departure in phenomenography is always relational.” (2004, p. 33), therefore in ontological terms, which seeks to classify and explain entities, it is these relational experiences which are being examined. This non-dualist ontology is additionally summarised by Marton who asserts that:

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“There are not two worlds: a real, objective world, on the one hand, and a subjective world of mental representations, on the other. There is only one world, a really existing world, which is experienced and understood in different ways by human beings. It is simultaneously objective and subjective” (Marton, 2000, p. 105).

So whilst a first-order view will be focussed on how something “really” is the second-order view is much more interested in how the phenomena is experience (the conception of it). This in turn influences the way in which the research questions are developed with a focus on “how” and “what” people experience rather than “why” they do it (Yates et al., 2012).

Whilst ontology focusses on questions such as “what is existence” or “what is the nature of the universe” epistemology focusses on the way in which we find out the answers to these questions, a focus on the “how” and the methods of approach (B. K. Daniel & Harland, 2017).

Within the study of epistemology there are a number of differing theories, but these largely converge into two main viewpoints. The first of these being “rationalism”, whereby it is possible to have knowledge of something even before we have experienced it and the second being “empiricism”, where researchers can only really understand anything once they have experienced it for themselves (Cline, 2021; Marton & Pong, 2005) and as previously indicated the foundation of phenomenography is derived from the latter, meaning that it seeks to draw upon these experiences from which to develop understanding of them. Therefore, epistemologically, the position is that this knowledge is specifically derived from the relationship between the individual and the phenomena (Booth, 2008; Yates et al., 2012) and that these conceptions are the aspects of knowledge that help us make sense of “something” within the world as represented through the phenomenographic outcome space (Dahlin, 1994; Marton, 1981). It is this “‘intentionality’ of human behaviours” (Han & Ellis, 2019, p. 2) which phenomenography is grounded in and how this research approach “provides a means through which knowledge about

the ways in which people experience phenomena can be revealed” (Yates et al., 2012, p. 101).

Due to its non-dualist foundations there is ultimately a “close relationship between the ontological and epistemological underpinnings of phenomenography” (Hajar, 2020, p. 3).

Although there are some who argue that there are “fundamental issues regarding the conceptual, epistemological, and methodological basis of phenomenographic research” (Richardson, 1999, p. 54), which is compounded by a lack of clarity around the “conceptual underpinning” of the methods associated with a phenomenographic approach, what is agreed is that the experience-based descriptions derived from a phenomenographical study can only be sought through the collection and analysis of participants first-hand accounts. Epistemologically then, phenomenography situates itself within constructionism in that seeks to understand the experience of individuals in a collective way. It is therefore important to note the difference between this and constructivism in so far that they “are used idiosyncratically and inconsistently at times” (Ireland et al., 2009, p. 5). Whilst constructivism focuses on uniqueness of individual experiences, constructionism is specifically interested in “the collective generation [and transmission] of meaning” (Crotty, 1998 p. 63 as cited in (Moon & Blackman, 2014) and so constructs meaning from the collective experience of individuals. It does this through understanding the way in which meaning is derived from the interplay between the object (phenomenon) and the subject (participant) (Moon & Blackman, 2014), and within that more specifically informed by an interpretivist epistemology, a philosophical perspective which opposes the more rigid positivist research frameworks (Edirisingha, 2012; Moon & Blackman, 2014) and which aligns to the non-dualistic ontology from which this study is derived.

### **5.3.3 Second-order perspective.**

As mentioned earlier, a fundamental element of phenomenography is its focus on describing the experiences of people in relation to aspects of the world from what is referred to as the second-order perspective. In one of his earlier papers on phenomenography Marton (1981) seeks to

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differentiate this from other empirical approaches by stating: “From the first-order perspective we aim at describing various aspects of the world and from the second-order perspective ... we aim at describing people’s experience of various aspects of the world.” (1981, p. 177).

This distinction is a unique key feature of phenomenography and what sets it apart from other empirical research approaches. Second order perspective is entirely focussed on answering questions about “people’s perceptions of reality” (1981, p. 178), so the intention is not to seek to describe the reality itself as it is, but people’s own conceptualisation of it. In terms of research approach Åkerlind (2018) proposes that: “From a second-order perspective, human experience and variation in experience is the core of the investigation; from a first-order perspective, human experience is but the medium for collecting data,” (2018, p. 6). The role of the researcher therefore is to ensure that the research outputs are the true representation of the “human experiences” and not an interpretation of them from the researcher’s perspective thus authentically representing the variations of experience in relation to the phenomenon.

If this was presented in the form of a research question then a first order question in relation this the area of study of this thesis would be along the lines of “How is the TPACK framework used in a UK Higher Education Institution?”, whereas the questions for this thesis are derived from the second order perspective, being more interested in the experiences of the users of TPACK and as such the research questions are much more orientated to “What are the experiences of academic staff using the TPACK framework in a UK Higher Education Institution?”.

The fact that the participants experiences are central to the knowledge and understanding gained through the research process means that the second order perspective is presented “from-the-inside” rather than “from the outside” in that it is a perspective that “sought to describe the world as the learner experienced it” (Richardson, 1999, p. 57). The distinction here is that it is not about seeking to understand or describe the event itself in a detached

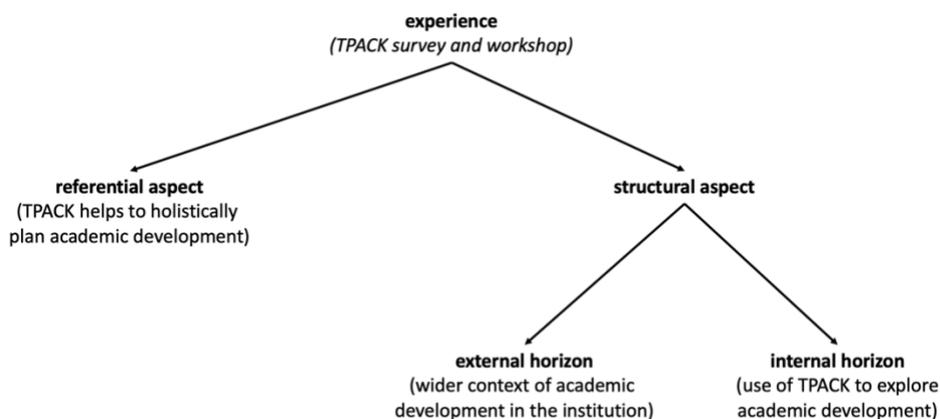
observational manner but to understand the experience of it as a phenomenon, from the viewpoint of the participants who experienced it.

### **5.3.4 Variation as a construct of knowledge.**

It is in seeking the unique and finite variations of experiences that separates phenomenography from other qualitative and empirical research approaches and the “thread that runs through the phenomenographic movement is an interest in variation” (Pang, 2003, p. 154) and so it is necessary to more deeply examine this particular aspect of the research approach.

The variations of experience which phenomenography seeks to identify are represented in more detail through the “anatomy of experience” (Marton & Booth, 1997). This identifies two separate elements of the experience which occur together, the first being the structural aspect, that is the *external horizon* (the background elements of the experience) and the *internal horizon* (the foreground or main focus of the experience) and the second being the referential aspect which relates to the meaning associated with the experience. In the context of my study the meaning that is derived (referential aspect) might be that the TPACK framework helps to plan academic development in a more holistic way as represented in Figure 8.

**Figure 13 - The anatomy of experience of TPACK.**



Note. Adapted from Han, F., & Ellis, R. A. (2019). Using phenomenography to tackle key challenges in science education. *Frontiers in Psychology, 10*(JUN), 1–10.

In this study it could be said that the internal horizon is predicated on the experience of using the TPACK framework for academic development activity, through the mechanisms of a linked survey and workshop, whilst the external horizon is the wider institutional academic development context within which this activity takes place.

These variations emerge through the analysis of the research data (usually interview transcripts) which are then coded and categorised (as described in the next section below) but that ultimately “knowledge is essentially a relation between the learner and the phenomena being learned” (Booth, 2008, p. 451). Whilst the experiences are individual, the results of the empirical data analysis lie at a collective level, from which these finite variations of experience are ultimately presented through the resulting categories of description and outcome space. The internal and external horizons (as depicted in figure 8) are a component of each participants experience whereby “a person must discern a whole from the context, and at the same time understand its relationship to the context as well as to other contexts” (Pang, 2003, p. 148). In my role as the researcher, it is therefore necessary for me to consider the selection of participants in order that it will cover the range of experiences from which to ultimately construct categories of description which are representative of the finite variation of experiences (this is discussed further as part of the research implementation). In fact, variation is such a prevalent aspect of this research approach that “variation theory” has emerged as a “theoretical extension to phenomenography” so as to move beyond its categorisation of experience in order to extend this into understanding “*why* that variation in experience existed” (Bussey et al., 2013), what some may also refer to as “new phenomenography” (Orgill, 2012) but it should be noted that this extension is not a feature of this study. These experiential variations become the

knowledge constructs within phenomenography and according to (Yates et al., 2012) there are a “number of different terms are used interchangeably to represent the knowledge interest of phenomenography” (2012, p. 100) but commonly referred to as “conceptions” or “categories of description” and presented by Marton (1981) as “Conceptions of reality are considered rather as categories of description to be used in facilitating the grasp of concrete cases of human functioning.” (1981, p. 177). The variation in description of these conceptions emerge from the transcripts, but then also act as representations against which further individual experiences can be applied. This symbiotic relationship is indicative of the way in which the “Data analysis occurs during several steps utilizing abductive and comparative analysis to formulate the various themes and categories of description” (Rands & Gansemer-Topf, 2016, p. 9) which is discussed in more detail in a subsequent section.

In summary, it is therefore fair to say that the ultimate goal of phenomenography is, through a thorough and rigorous data gathering and analysis process, to present resulting outcome spaces that represent the finite ways in which people experience a phenomenon and that fundamentally as a research approach “Variety is considered significant for phenomenographic studies because the more diverse the experience the greater the chance for finding variation in the way people understand a phenomenon.” (Franz, 1994, p. 176).

### **5.3.5 Conceptions, categories of description and outcome space.**

As already alluded to in a previous sub section, a resulting output from the research is presented through an outcome space which is itself derived from the categories of description and the relationship between them that have been formed from the empirical data gathered and analysed relating to the research participants experiences. Therefore “the description of the participants’ conceptions are the categories of description, and the graphical representation of the conceptions is the outcome space.” (Hajar, 2020, p. 8).

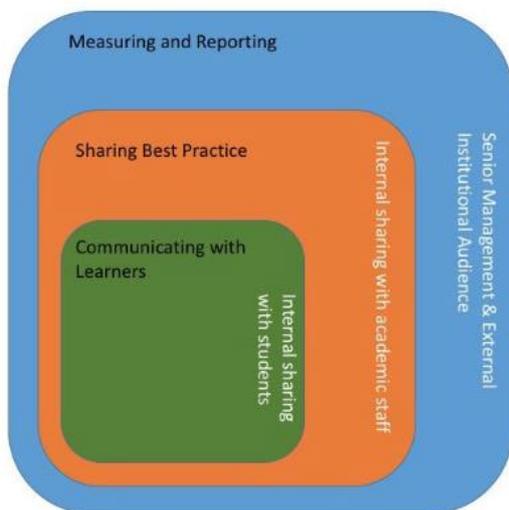
Conceptions are the ways in which individual participants experience the phenomenon, gathered through the interview process and transcription analysis. Ashworth and Lucas assert that “it must therefore be a paramount requirement for phenomenography to be sensitive to the individuality of conceptions of the world—it must be grounded in the lived experience of its research participants.” (1998, p. 417) and in so doing the researcher must seek to remain impartial and cast aside any predetermined ideas of the experience from their own viewpoint (this process is known as bracketing and is discussed in Chapter 6, the research implementation chapter). Therefore, conceptions are the truest representation of the experiences of the participants and cannot be assumed or presupposed but are drawn directly from the analysis of the transcripts (Hajar, 2020).

As discussed, phenomenography seeks to understand the variations by which people can experience a phenomenon and so these conceptions are categorised in such a way as to represent these collective experiences which are distinctly different from each other. These “categories of description” are not about placing individual participants into a single category, but placing their lived experience within a category where it is collectively varied from others. In this way participants experiences may sit across a number of categories depending on their experience, as presented through the transcript data, and so “when statements from different [participants] are brought together, that collective “pool of meaning” reveals a rich variety in understandings.” (Eckerdal, 2006, p. 9) and so it is these and the relational elements between them from which the categories of description are derived with a particular focus “on the critical aspects of a way of understanding a given phenomenon that make it different from other ways of experiencing that phenomenon.” (Hajar, 2020, p. 8). These categories are representative of the limited ways in which an phenomenon can be experienced and understood and it is expected that they are relational and hierarchical (Marton, 1994), although to note, whilst they are

generally accepted expectations of the categories of description Ashworth & Lucas (1998) are in fact critical of these assumptions.

The relational aspects of these categories of description are ultimately presented through a visual (often graphical) representation and as such the “outcome space is the complex of categories of description comprising distinct groupings of aspects of the phenomenon and the relationships between them.” (Marton & Booth, 1997, p. 125). In the same publication Marton & Booth set out three criteria for an outcome space. Firstly, that each category is distinctive but shows a clear relationship with the phenomenon being experienced, secondly that there is a relationship between categories which is logical and almost always hierarchical and thirdly that the researcher should be seeking to present the outcome space with as few categories as possible, whilst representing the finite number of different ways that the phenomenon can be experienced. The outcome space below (Figure 9) is an example from one of my own previously published studies and exemplifies the type of graphical representation which is common for visualising the outcome space. In this example three inter-related categories were identified and presented hierarchically in relation to an institutional structure.

**Figure 14 – Outcome Space Example**



Note. From Thomson, S. (2016). To What Extent Do Academic Staff See An E-learning Framework As Being Effective In Supporting Technology Enhanced Learning (TEL) Discussions And Activities? *Journal of Perspectives in Applied Academic Practice*, 4(2).

Ultimately the outcome space should be representative of all of the participants experiences, analysed and categorised to establish the finite ways in which the event can be experienced and so “represent the full range of possible ways of experiencing the phenomenon in question, at this particular point in time, for the population represented by the sample group collectively.” (Åkerlind, 2012, p. 323).

## **5.4 Rationale for using phenomenography.**

### **5.4.1 Appropriateness of phenomenography for this study.**

Phenomenography’s emergence as a research approach for exploring the experience of learners in a higher education setting makes it an ideal methodology therefore for examining the experience of academic staff in relation to their own learning and development also in a higher education setting.

The research questions (as presented in Chapter One and provided again below for convenience) require a qualitative approach to examine them.

*RQ1: How does the qualitative variation in academic staff's experiences of professional development through Technological Pedagogical Content Knowledge (TPACK) influence their identification, planning, and overall perception of TPACK as a framework for professional development within the context of higher education?*

*RQ1a: What distinct qualitative factors can be derived from the nuanced experiences of academic staff in their professional development through the application of TPACK?*

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*RQ1b. What distinct qualitative elements can be identified through the experiences of academic staff in how they discern and strategise their professional development planning within the TPACK framework?*

*RQ1c. What inherent qualitative factors contribute to the diverse ways in which staff perceive and engage with TPACK as a framework for professional development?*

*RQ2: To what extent does the integration of Technological Pedagogical Content Knowledge (TPACK) as a framework for academic staff development effectively support a more holistic approach to academic development?*

With phenomenography being a qualitative research methodology, it is ideally placed to support this research, specifically because of its core strength being to examine the lived experience of participants it is better able to gather and present the necessary data to authentically represent the experiences of individuals in relation to the phenomenon being explored. “The ability of qualitative data to more fully describe a phenomenon is an important consideration not only from the researcher’s perspective, but from the reader’s perspective as well.” (Hoepfl, 1997, p. 49). There is also a symbiotic relationship between the research question and the research methodology. Harper (2011) states that “Once one has formulated a research question, one then needs to make a final selection of the method, choosing the one which best addresses the question.” (2011, p. 2) and so it is important that the methodology selected is appropriate for the question(s) being asked. The aim of this research is to understand the experiences of staff using the TPACK framework and as such the research questions are framed in a such a way as to support this. As Marton (1986) states:

“The point of departure in phenomenography is always relational. We deal with the relation between the individual and some specified aspect of the world, or, to state it differently, we try to describe an aspect of the world as it appears to the individual” (1986, p. 33).

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As this research and the associated questions are centred around examining the experiences of staff and their relationship with the TPACK framework, phenomenography is perfectly aligned with the ambitions of the research activity, in that it “aims at identifying and interrogating the range of different ways in which people perceive or experience specific phenomena” (Tight, 2016, p. 319), but more importantly as a phenomenographic researcher I am not seeking “to describe things as they are” but trying “to characterise how things appear to people” (Marton, 1981, as cited in (Marton, 1986, p. 33).

By examining the experience from the perspective of the participants the researcher is better able to understand the extent to which TPACK might be an effective framework for supporting the ambitions to develop the digital skills of staff in an embedded, holistic way at the institution where the study is based. It is important therefore key that the experiences are not my interpretation of the participants experiences but are representative of how the phenomenon has been “experienced in a finite number of qualitatively different ways” (Pang, 2003, p. 147), which forms both the categories of description and ultimately the outcome space.

#### **5.4.2 Developmental phenomenography.**

‘Pure’ phenomenography, as described above, considers that the outcomes of the research (in the forms of outcomes spaces) are the end goal of the research activity and as such not intended to be anything more than a representation of the variety of ways in which the phenomenon has been experienced. Developmental phenomenography whilst still using the principles associated with the methodology also seeks to use the outcomes to inform changes based on those experiences. Bowden describes developmental phenomenography as:

*The phenomenographic research that I engage in is situated within a particular kind of context. I focus on research which, through finding out how people experience some aspect of their world, will enable them or others to change the way their world operates, normally in a*

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formal educational setting. My perspective is developmental. My reasons for undertaking the research are concerned with how I can use the research outcomes to affect the world I live and work in. The research outcomes are not the objective per se.” Bowden (1995) as cited in (Green & Bowden, 2009, p. 53).

Whereas Marton and Booth state that “phenomenography is not a method in itself, although there are methodological elements associated with it” (Marton & Booth, 1997, p. 111), Bowden and Green argue “that the research methods should indeed be subordinate to the research approach and, if the approach involves addressing a practical educational problem, then the methods used should be subordinate to the needs of that educational problem.” (2009, p. 54). In this way they position developmental phenomenography to be distinct (albeit aligned to) pure phenomenography by the very fact that they firstly make use of the research outcomes to inform (educational) issues and as such determine that as such the research methods are “determined.....by the particular needs of the application that generated the research interest.” and that it is this which “distinguishes developmental from pure phenomenography.” (2009, p. 54).

Whilst this thesis is strongly aligned to the principles of ‘pure’ phenomenography it does draw upon some of the principles of ‘developmental’ phenomenography with regards to the interviewing and data analysis phases (described in later chapters). In particular the principles relating to ‘sampling’, interviewing’ and ‘analysis’ helped inform the research design of this project. (Note: the list numbering below correlates directly the list proposed by Green & Bowden, (2009)):

### ***Sampling***

4. *Developmental phenomenography tends to use ‘maximum variation sampling’.*

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*5. The success of a developmental phenomenographic research project is dependent on the decision about data sources, which must be related to the overall developmental objective.*

### ***Interviewing***

*6. Phenomenographic research usually involves the collection of all data in a single phase.*

*7. Phenomenographic research usually involves interviews carried out in a single block of time.*

*8. The use of one researcher as interviewer is preferable in order to promote consistency in questioning and in the ways in which responses are prompted and contrasted.*

*10. Interviewers should minimise their input to the content of the interviews and focus on neutral questions aimed at encouraging the interviewees to elaborate their own ways of seeing the phenomenon.*

### ***Preparation for Analysis***

*12. The analysis should not begin until all interviews have been completed.*

*13. Interviews should be audiotaped and transcribed in full.*

*14. No matter who produces the verbatim transcripts of the interviews, the interviewer should undertake the final edit of the transcript while listening to the audiotapes.*

### ***Analysing***

*15. No evidence should be considered in the development of the categories of description except that which is in the interview transcripts.*

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*18. Phenomenographic analysis requires continual cycles of reading and re-reading which result in a series of modifications to the categories of description until saturation is reached.*

*20. In order to extract meaning related to the research question, the researcher focuses on what the understanding of the phenomenon must be, given what has been said in the transcript.*

*23. The goal of the analysis is to develop a set of categories of description that maximise the coherence within a category and also maximise the differences between categories;*

*24. Evidence for the structural relationships between categories should be sought from within the transcripts*

Note: Adapted from (Green & Bowden, 2009).

Drawing upon these principles helped me in the planning and implementation of the research activity. Whilst it was not the intention of this research to align itself to being a developmental phenomenographic study, some of the principles were useful in shaping the overall research design and in particular the data collection and analysis phases, whilst retaining the overall research methodology for 'pure' phenomenography.

### **5.4.3 The object of study in phenomenography.**

As described earlier in this chapter the purpose of phenomenography is to examine peoples understanding of reality in the context of their experience, in this thesis their experience of using TPACK as a framework for their academic staff development. More specifically 'pure' phenomenography is interested "describing how people conceive of various aspects of their reality" (Marton, 1986, p. 38). In the same publication Marton shares an example of a study by Theman (1983) asking residents about their experience of " a minor demonstration against the

construction of a downtown garage” (1986, p. 39) in order to understand their conceptions of ‘political power’. In a similar way my study is examining the experiences of people in relation to a more specific experience, in this case their use of TPACK and their conceptions of using that framework in relation to their academic development. As observed in Figure 12, Bowden (2005) proposes that the ‘object of study’ is not specifically the phenomenon but the “relation between the subjects and that phenomenon” (2005, p. 12) and so whilst the ‘event’ being experienced is a component of the experience it is not the focus for the data collection, analysis or discussion. In the majority of phenomenographical studies the ‘phenomenon’ being examined is broad and largely assumed to be understood and therefore not specifically described. As an example in a study about grade descriptors (Tan & Prosser, 2004) the description of the phenomenon merely states “the term ‘grade descriptors’ has commonly been used to refer to the practice of describing for students characteristic work that would merit different grades.” (2004, p. 267) with an assumption that the reader will be familiar with their use and implementation. In this thesis, where I cannot assume the reader will have knowledge of the phenomenon, I have provided a description of it (Chapter 4) to provide the reader with detailed insights into the phenomenon and thus the experience staff have of using TPACK, in order to provide the necessary context through which to fully understand the findings. This approach does not detract from using phenomenography, as its core theoretical underpinning and methods are retained. In fact using phenomenography successfully in this way adds another dimension to the way in which it can be used and contributes to knowledge in this area, as discussed further in Chapter 9.

#### **5.4.4 Becoming a phenomenographic researcher.**

Despite having been using phenomenography for research since 2015 I would still consider that in every study where I have used phenomenography, I learn something new about it as a methodology and the methods associated with it. As described earlier in this chapter, this thesis is very much framed around “pure” phenomenography, in the sense that it is “concerned with

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describing the full range of the diverse ways in which people experience conceptions of a phenomenon” (Ireland et al., 2009, p. 2) and drawing upon ‘developmental’ phenomenography for elements of its design, rather than what is termed “new” phenomenography which additionally seeks to understand “how” they experience it (Pang, 2003).

I have been fortunate during my PhD studies that I have been able to make use of the phenomenographic methodology in at least three smaller studies prior to this and as such ‘hone my skills’ as a phenomenographic researcher. In particular the process of interviewing in the context of phenomenography has been most valuable preparation for this thesis and the interview is of particular importance in phenomenographic research and so researchers should be sure to practice and refine their skills in this area (Akerlind, 2005). Additionally, the data analysis and ultimately the development of outcome spaces are of key importance and so practicing these was also valuable in preparation for this study. One of those earlier phenomenographic studies was subsequently published in a peer reviewed journal which helped me to validate myself as a published phenomenographic researcher.

Despite the fact that the scale of this thesis was significantly larger than my earlier studies I now had an excellent foundation from which to carry out this research, based on previous use of the research methodology and that through the process of this study I would continue to develop my skills and knowledge as a phenomenographic researcher.

### **5.5 Alternative methodologies.**

In seeking to identify a suitable research methodology for this study there were two other closely associated qualitative methodologies which were also identified and which are well-known (Sharma, 2004). The first of these is phenomenology against which phenomenography has been referred as the “poor relation” (Entwistle, 1997, p. 131) but from which it must be “clearly distinguished from” (Alsop & Tompsett, 2006, p. 243) as a research approach in its own right. The

second is grounded theory, and it has been said that “methods of data analysis employed in phenomenographic research seem to be indistinguishable from those of grounded theory” (Richardson, 1999, p. 68) and so naturally phenomenography has been linked with this alternative methodology. Both methodologies are discussed in more detail below.

### **5.5.1 Phenomenology.**

In the same way that phenomenography is interested in participants' experiences so too is phenomenology (Harper, 2011) and more specifically “is the study of structures of consciousness as experienced from the first-person point of view” (D. W. Smith, 2018). So whilst the obvious association with “phenomena” is clear, the defining difference between this and phenomenography is that its focus is on first-order, rather than second-order knowledge constructs (see Figure 6) and in particular the commonalities of experience between participants. The formal development of phenomenology is attributed to Edmund Husserl, a late 19<sup>th</sup> Century / early 20<sup>th</sup> Century philosopher who defined it as “the science of the essence of consciousness” (Husserl, 1963, as cited in (D. W. Smith, 2018)). There are a number of researchers who have discussed the similarities and differences within the context of phenomenography (Alsop & Tompsett, 2006; Barnard et al., 1999; Sharma, 2004; Tight, 2016; Webb, 1997).

Larsson and Holmström (2007) suggest that it is the textual analysis stage where the two methods are distinctive “In phenomenography, text passages containing the interviewees' reflections on their experiences are also considered valuable, in contrast to phenomenological studies where the difference between pre-reflective and reflective experience is essential.” (2007, p. 62). They explore the notion that whilst it is possible for the same interview transcript data to be used for both phenomenology and phenomenography they are ultimately analysing it from alternate viewpoints with differing results. So, it would have been entirely possible to make use of phenomenology in the wider context of the participants' experiences but in order to

specifically answer the research questions being posed here phenomenography is more ideally suited. In summary phenomenology is to understand the “essence” of the phenomenon whilst phenomenography is specifically seeking to understand the variety of experiences (Assarroudi & Heydari, 2016) as summarised in the table below.

**Table 1 - Comparison of phenomenography and phenomenology**

<b>Phenomenography</b>	<b>Phenomenology</b>
The aim is to describe the variety of perceptions and understandings of the experienced phenomenon from different viewpoints.	The aim is to reveal the essence of a phenomenon of interest.
Second-order perspective is the main approach which tries to describe the perception of a participant regarding an experience.	First-order perspective is the main approach which tries to describe the essence of the phenomenon, requiring phenomenological reduction of the experience.
Analysis would lead to recognizing perceptions and outcome space.	Analysis would lead to recognizing meaning units.

Note. From Barnard, A., McCosker, H., & Gerber, R. (1999). Phenomenography: A Qualitative Research Approach for Exploring Understanding in Health Care. *Qualitative Health Research*, 9(2), 212–226. <https://doi.org/10.1177/104973299129121794>.

### **5.5.2 Grounded theory.**

As already established, Phenomenography emerged from a higher education context. Although it has expanded into other areas such as health care and other levels of education research, it is very often seen as being “owned” by researchers examining higher education contexts. Grounded theory (GT), however, is presented as a “general research method” and therefore not specifically “owned” by any one research discipline (Scott, 2016). The key tenet of this largely qualitative research method is that it is an “inductive approach” which uses data to derive new theories and understanding in a symbiotic and iterative process. (Corbin & Strauss, 1990).

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Grounded theory is attributed to Glaser and Strauss (Heath & Cowley, 2004) and originally emerged from a study being undertaken on patients who were dying in hospital and published in 1965. According to Qureshi & Ünlü (2020) there are seven principles required of grounded theory oriented research.

1. Starting research with a broad research focus or question
2. Delaying literature review until later stages of research
3. Conducting simultaneous data collection and analysis
4. Conducting constant comparison method
5. Keeping memos
6. Theoretical sensitivity
7. Theoretical sampling

(2020, p2)

These seven principles are indicative of the iterative nature of the method which has broader starting point in terms of research question, but with a strong emphasis on data analysis, interpretation, and comparison so as to inform and adapt the research questions as it emerges from the data. Whilst the data format may be similar to phenomenography (interviews and transcripts) it can also often involve observations, documentation and multimedia resources (Corbin & Strauss, 1990). Both phenomenography and GT are derived from a non-positivistic knowledge view, although early research using GT appears to show elements of a positivistic view (Kinnunen & Simon, 2012).

**Table 2** - Summary of some of the aspects of phenomenography and grounded theory.

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<b>Phenomenography</b>	<b>Grounded Theory (Strauss and Corbin)</b>
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Focus	Variation in perceptions of the phenomenon Second order perception	Experience, perception, action
RQ/goal of the research	E.g. instructors' perceptions of students' success	E.g. to explore how computer science majors experience the process of doing programming assignments in a CS1 course
Data source	Often semi-structured interviews or writings	Semi-structured interviews, writings, observations, artefacts, even quantitative data
Analysis process	Inductive, iterative, uses comparison Sorting, categorizing, abstracting	Inductive, iterative, uses comparison Open, axial and selective coding phases Paradigm model gives guidelines
Results/outcome of the analysis	An outcome space/categories of description, which are logically related to each other.	Models, stories that describe the variation in context, actions, intervening events and consequences

Note. From Kinnunen, P., & Simon, B. (2012). Phenomenography and grounded theory as research methods in computing education research field. *Computer Science Education*, Vol. 22, pp. 199–218. <https://doi.org/10.1080/08993408.2012.692928>

In the context of this study I am seeking to examine the experiences of academic staff in the context of a specific experience. To this end the research questions are established early on in the process and help inform the questions for the semi-structured interview process. Given that GT is not specially focussed on examining how people experience and perceive a given phenomenon it was not deemed suitable for this study.

## **5.6 Chapter summary.**

In this chapter I set out the approach being taken in this study, that being phenomenography. It started by establishing the conventions of a qualitative research approach, followed by a definition of phenomenography and associated terminology. Its philosophical foundations were presented with a particular focus on second-order perspective so as to understand its

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epistemological and ontological position as a research approach. As variation of experience is a fairly unique feature of phenomenographic research this was discussed in more detail as well as a specific sub-section examine specific conventions around the analysis and outputs from phenomenographic research. Finally in this chapter I have also explored two alternative qualitative research approaches and whilst there are similarities between them I have established that phenomenography is the most appropriate research approach for the research questions of this study.

This chapter has provided a strong theoretical underpinning for phenomenography and rationale for its use in the context of this study. The next chapter will focus on providing an overview of the phenomenon being experienced by the participant so that it is clear in what context TPACK is being used in the institution and also what TPACK informed activities are being undertaken by the participants.

## **Chapter 6: Research Implementation.**

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### **6.1 Introduction.**

Having clearly established the context of the research this chapter now builds upon the previous chapters to set out the approach taken with regards to the implementation of the research.

Whilst Chapter 5 sets out a definition of phenomenography and establishes a rationale for its use for this study, this chapter more specifically details the approach I have taken with regards to the implementation of the research methodology and methods relating to phenomenographic.

Additionally, Chapter 4 provides the context within which the participants' experiences have taken place and helps establish how participants were firstly involved in the use of TPACK and additionally their involvement in this study, of which further detail will be presented in this chapter. This chapter begins by detailing the process for recruiting participants, more specifically the use of purposeful sampling to ensure that all the variations of experiences were more likely to be presented. Next, I will go on to detail the approach taken for the data collection and then the data analysis, with particular reference to 'bracketing' as a method to ensure impartiality and detachment from the phenomenon by the researcher. Approaches to the validity and reliability of the data will be discussed as well as consideration of ethical issues and approaches to confidentiality and data security.

### **6.2 Participant selection.**

As discussed in chapter 4 the context of the phenomenon meant that the pool of potential participants was limited to those who had undertaken the workshop and related activities. At the time of this study there were fifty-four staff who had participated in the workshop activity facilitated by staff from CLT. All fifty-four TPACK workshop participants were invited to participate in this study with thirty-eight registering an interest to do so. By the very nature of phenomenographic studies it is necessary that the participants have experience of the

phenomena being studied (Yates et al., 2012) and that any selection process should be based on the increased desire to seek variation of experience.

Although there is no prescribed sample size for studies of this nature (Patton, 1990; Yates et al., 2012) the number of participants for a phenomenographic study is generally considered to be between 10-30 individuals (Marton, 1988; Trigwell, 2006) and to be of suitable size to increase the likelihood of variation of experience, whilst maintaining a sample size that remains manageable for the timeframe and type of study (J. Bowden, 2005).

In order to achieve this, purposeful sampling is often used in phenomenography as a process by which to select participants with a view to ensuring the likelihood of variation in experience whilst having a manageable sample size. A key function of purposeful sampling is “to select information rich cases that best provide insight into the research questions” (Mathison, 2013, p. 2) and in the case of phenomenography to use purposeful sampling to maximise variation. Patton (1990, p. 181) asserts that “the (purposeful) sampling strategy must be selected to fit the purpose of the study” and consider “the resources available, the questions being asked, and constraints being faced.”. As such there is no prescribed manner or specific rules by which to implement purposeful sampling (Palinkas et al., 2013) but there are some strategies which can be drawn upon from other studies in order to identify those which might best be used in the context of this qualitative research which is specifically seeking variation of experience as summarised in the table below.

**Table 3 - Purposeful sampling strategies with emphasis on variation.**

Strategy	Objective	Considerations
Intensity	To illuminate both the unusual and the typical	Requires the researcher to do some exploratory work to determine the nature of the variation of the situation under study, then sampling intense examples of the phenomenon of interest

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Maximum variation	Important shared patterns that cut across cases and derived their significance from having emerged out of heterogeneity	Can be used to document unique or diverse variations that have emerged in adapting to different conditions
Critical case To	To permit logical generalization and maximum application of information because if it is true in this one case, it is likely to be true of all other cases Clinicians	Depends on recognition of key dimensions that make for a critical case. Particularly important when resources may limit the study of only one site (program, community, population)
Theory-based	To find manifestations of a theoretical construct so as to elaborate and examine the construct and its variations	Sample on the basis of potential manifestation or representation of important theoretical constructs Sampling on the basis of emerging concepts with the aim being to explore the dimensional range or varied conditions along which the properties of concepts vary
Confirming and disconfirming case	Once trends are identified, deliberately seeking examples that are counter to the trend	Usually employed in later phases of data collection. Confirmatory cases are additional examples that fit already emergent patterns to add richness, depth and credibility. Disconfirming cases are a source of rival interpretations as well as a means for placing boundaries around confirmed finding
Stratified purposeful	To capture major variations rather than to identify a common core, although the latter may emerge in the analysis	This represents less than the full maximum variation sample, but more than simple typical case sampling
Purposeful random	To increase the credibility of results	Not as representative of the population as a probability random sample

Note. Adapted from Palinkas, L. a., Horwitz, S. M., Green, C. a., Wisdom, J. P., Duan, N., & Hoagwood, K. (2013). Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research. *Administration and Policy in Mental Health and Mental Health Services Research*, 1–12. <https://doi.org/10.1007/s10488-013-0528-y>

In the context of this study I have drawn upon the 'maximum variation' strategy, which specifically seeks to support the understanding of differences of experiences. A benefit of this approach is that where a study may consist of small sample sizes it is possible to select participants by their diverse attributes that exist among them and that using this approach will help to provide "high-quality, detailed descriptions of each case, which are useful for documenting uniqueness" (Patton, 1990, p. 172). This approach is also one of the principles of developmental phenomenography, as presented earlier in this thesis. The participant data that was initially captured from the thirty-eight who registered an interest to be involved in the study was used to identify those potential attributes of diversity from which to select participants. From this initial participants data there were two potential attributes from which to identify diversity of participants to provide an opportunity to ensure as wide as possible variation of experiences. The first of these was length of service at the institution, but considering that the majority of potential participants (twenty eight) had been at the institution for 10 or more years there was unlikely to be much variation of experience based on that attribute. However, the second attribute identified was from which School the academic member of staff was based and this showed that from those thirty-eight potential participants they represented all nine schools of the institution. Yates et al. state that participants "should be selected based upon their appropriateness to the purpose of the research study, that is, they have experience of the phenomenon being explored" and that "Fundamentally the aim of participant selection is for a purposive sample likely to uncover variation" (2012, p. 103).

Therefore, eighteen participants (two from each school) were identified, from the original thirty-eight, to participate in the study and were allocated participant identities labelled A to R.

However, during the period of the study two participants (E and N) withdrew from the study. The first of these retired from the institution before an interview was able to be undertaken and the

second of these moved to another institution and asked that their interview data not be used and so it was deleted before any analysis of it was made. Therefore, the final sample size for the study was sixteen, which still represented all schools in the institution and is still a suitable size for a phenomenographic study from which to collect data, as described in more detail below.

### **6.3 Data collection.**

Qualitative research data is often gathered through an interview process, either collectively (usually via focus groups) or individually (1 to 1 with a member of the research team) (Patton, 1990). More specifically phenomenographic research data is almost always collected through the process of interviewing participants (Marton, 2004) and in particular semi-structured interviews which are undertaken using open-ended questions to “explore the interviewee’s experience of the phenomenon in depth” (Trigwell, 2006, p. 371) and allow for the participant’s individual experience to emerge through the interview process so as to explore “greater and greater depths of thinking without leading” (Yates et al., 2012, p. 102). These interviews are usually between thirty to sixty minutes in length, with a list of pre-prepared “trigger” questions from which the interviewer can then use additional in-session questions for the purpose of further analysis and depth. The nature of the interview should be ‘conversational’ and one of ‘partnership’ between the interviewer and the participant, with the role of interviewer being to help the participant reflect on their experience (Ashworth & Lucas, 2000).

Bruce (1994) asserts that there are distinctive features of a phenomenographic interview in so much that their purpose is to uniquely “seek variation in people’s experience or understanding of the phenomenon in question” (1994, p. 50). Additionally, she goes on to also suggest that the role of the interviewer is also ‘distinctive’ where the role of the interviewer is to “try to see the phenomenon as it is seen by the interviewee” as well as “helping the interviewee to thematise relevant aspects of their life world” (p. 50).

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The length of interviews will vary depending on the participant and their ability to reflect on their experiences but are usually between thirty and sixty minutes in length (Trigwell, 2006). In this study the shortest interview was twenty-eight minutes and the longest was sixty-seven minutes which sits within the parameters of an expected length for this type of interview. In the context of phenomenography, where the intention is to understand the experiences of participants, a key challenge of this type of interview is that the researcher does not lead or introduce ideas into the conversation, although they may seek further information or clarification (J. Bowden, 2005; Yates et al., 2012).

All interviews began with the following couple of general opening questions to help settle participants into the conversation and to get them started on reflecting on their experiences.

- Please can you briefly describe your role and how long you have been at the institution?
- Please can you describe what have been your motivations for undertaking academic staff development in the past?

It is important in interview situations to make the process feel as natural as possible and in particular for phenomenographic research the conversations need to be free of judgement or restriction so as to “help build rapport with participants, contextualize the experiential responses, and inform follow-up questions” (Brightman et al., 2019, p. 3).

The main interview questions that were discussed and agreed for use were structured around the research questions in the following manner:

*RQ1a: What distinct qualitative factors can be derived from the nuanced experiences of academic staff in their professional development through the application of TPACK?*

The main interview question asked was:

- How would you describe your overall experience of using the TPACK framework in the context of your academic development?

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- With reference to your personalised radar chart (which was completed as part of the pre-workshop activity) please can you talk through your experience of completing the survey that created this?
- Additional sub questions relating to the experienced, designed to gather a deeper understanding of specific elements of the experience were also developed and used where necessary as part of the interview process.
  - To what extent was the resulting mapping chart that was produced useful to you during the workshop?
  - How accessible was the TPACK framework for you to use in the context of the workshop experience?
  - Please can you describe your experience of undertaking the mapping of academic development activities against the TPACK framework?

Similarly, a main interview question and subset of interview questions was also developed for the other research questions.

*RQ1b: What distinct qualitative elements can be identified through the experiences of academic staff in how they discern and strategise their professional development planning within the TPACK framework?*

- Prior to the TPACK mapping experience how have you previously identified your individual academic development needs?
  - To what extent did using the TPACK mapping approach help you reflect upon your professional development activities and the future planning of them?
  - To what extent has using the framework changed the way you will approach your academic development activities?
  - To what extent has your digital development using TPACK been effective in supporting your learning and teaching practice?

*RQ1c: What inherent qualitative factors contribute to the diverse ways in which staff perceive and engage with TPACK as a framework for professional development?*

- Based on your experience of using TPACK to what extent would you consider the framework as effective in supporting academic staff development activity?
  - To what extent had you been aware of the TPACK framework prior to the workshop activities?

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- What is your experience of using TPACK to plan/develop your technological knowledge whilst at this institution?
- What is your experience of using of using TPACK to plan/develop your pedagogical knowledge whilst at this institution?
- What is your experience of using TPACK to plan/develop your content knowledge whilst at this institution?

RQ2: *To what extent does the integration of Technological Pedagogical Content Knowledge (TPACK) as a framework for academic staff development effectively support a more holistic approach to academic development?*

- What has been your experience of using TPACK as a framework to specifically support your TEL development and digital pedagogy in line with the digital education strategy?
  - Has the use of TPACK enhanced your digital skills development, if so how?
  - Can you describe your experience of using TPACK to deepen digital pedagogic knowledge.
  - What difference has using TPACK made to your development approach?

Due to the nature of semi structured interviews being conversational the questions were not necessarily presented in the order above and in fact in many cases the use of one question would often result in the interviewees reflecting upon their experiences in ways which covered multiple questions.

Marton (1988, as cited in Bruce, 1994) makes the suggestion that a researcher must “let the subject choose the dimension for his or her answer (we want very much to find out what dimension he or she is choosing)” and so therefore we must focus our interview technique on enabling this.

Whilst the questions are there to help the participants it is not the role of the interviewer to necessarily make sure all of the questions are answered. Bowden suggests that “interviewers should minimise their input to the content of the interviews and focus on neutral questions aimed at getting the interviewees to elaborate their own ways of seeing the phenomenon.”

(Green & Bowden, 2009, p. 55) and so to unnecessarily ask questions may disrupt and detract from the participants own narrative of their experience.

So, one of the challenges associated with phenomenographic research is ensuring that the researcher does not impose their own view of the phenomenon, especially where interviewees may seek clarification or approval about what they are saying, and 'distort' the outcomes of the research (J. Bowden, 2005). It is therefore imperative that the interviewer has limited input during the interview process and that any responses to the interviewees should be to request additional information or deepening understanding of the participants experience.

Each participant was provided with a participant information sheet prior to the interview (sent by email) with an opportunity to ask questions and get further clarification of the purpose of the study (none did so). They were asked to bring a signed copy of this to the interview, but where they did not do so paper copies were available during the interview which the participant signed prior to the interview being started. Additionally, they were invited to bring with them their TPACK spider / mapping document (as previously described in Chapter 5) to help them in the process of reflecting on their experience and all of them did so (either physically or electronically) and referred to it during the conversation. All interviews were scheduled to take place on the campus of the institution, in a neutral private location (i.e. not in their staff offices) so as to avoid any distractions for the interviewees and also to ensure that there would not be any interruptions. Interviews were audio recorded and transcribed using a mixture of auto transcription and manual editing to ensure accuracy.

#### **6.4 Data analysis.**

In this section I will provide an account of the approach taken to the analysis of the data, drawing upon wider literature to indicate how this has influenced and inform my approach. As previously identified, there were seventeen interviews which took place (of which the data from sixteen

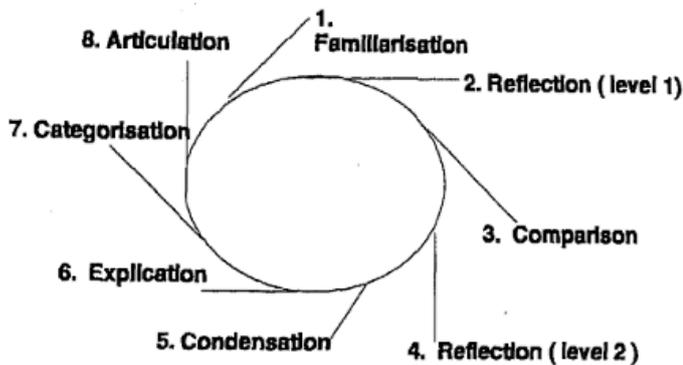
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was used in this study due to one participant request to withdraw). Analysis of research data should not begin until such time as all the interviews have been completed so ensure that each interview is undertaken in the same way, (Green & Bowden, 2009) without any bias or influence from any data which may have emerged from earlier interview data.

The purpose of the analysis is to search for structural relationships between participants experiences leading to the formation of conceptions, categories of description and ultimately the outcomes space(s), the latter of which is described in more detail in a sub-section below. Marton asserts that it is not possible to “specify the exact techniques for phenomenographic research.” (1986, p. 42) due to the fact that the process is based on a journey of discovery which cannot be analysed through the use of ‘algorithms’ or pre-determined coding patterns. However, he does go on to suggest that “there is a way of proceeding with the task which can be described, even if it cannot be specified in detail.”, (1986, p. 42) the first ‘phase’ of which is to identify quotes within the transcripts which would be considered relevant to the research question(s) being studied. For example, for RQ1 the intention is to examine the variation of experiences that academic staff have in relation to using TPACK for staff development. However, this appeared to oversimplify what was a highly complex process.

Bruce (1994, p. 117) proposes an eight-stage process for analysis (Figure 15) starting with familiarisation through to articulation (presented as the discussion chapter in this thesis).

**Figure 15 – Eight Stage Phenomenography Analysis**



Note: From Bruce, C. S. (1994). Reflections on the experience of the phenomenographic interview. In R. Ballantyne & C. Bruce (Eds.), *Phenomenography: Philosophy and Practice*.

Ultimately, it is this model which I drew upon to inform my own practice with regards to the analysis and discussion of the data and ultimately shaped my approach as I considered it to be structured enough to provide an outline approach, whilst not being overly prescriptive as to restrict the flexibility required for phenomenographic research. Therefore, the first phase I undertook was actually to make sure I was familiar with the data. This was achieved in a couple of ways, firstly as the interviewer I already had some familiarity with the data, having been present for the interview. However, as previously noted, it is not appropriate for the interviewer to review any data until all of the interviews had been completed, so whilst I was present I had purposefully not taken any mental or physical notes of responses so as to not bias any analysis later on in the process. Therefore, the first time I really had sight of the data in a written form was when I had completed the automated transcription process and started undertaking the manual editing for accuracy, and even at this stage no coding was started. However, it did increase familiarity with the text and was the beginning of me undertaking multiple readings for each transcript before starting any formal coding process.

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The second, stage of the process (which Bruce refers to as Reflection (level 1) is the first point at which any coding begins and is intended as a 'surface analysis' of the text, identify elements of the text which appear relevant to the research question(s). Marton (1986) refers to these as 'utterances' and states that "the first phase of the analysis is a kind of selection procedure based on criteria of relevance. Utterances found to be of interest for the question being investigated (for example, What are the different conceptions of political power?) are selected and marked." (1986, p. 42).

In the context of this study I focussed on one research question at a time, reading through the transcripts with a focussed attention on one question each time, highlighting text as quotations through which participants had articulated their experiences of the phenomenon. The third and fourth stages of Bruce's model are indicative of qualitative data analysis and similar to that of other methods such as grounded theory in so far as they align to "the central idea that theoretical understanding emerges from an iterative process based on a constant sampling, comparison, and analysis of transcribed excerpts from interviews" (Richardson, 1999, p. 70) and that through this process a number of quotes are selected and form a data pool from which the individual participant data (conceptions) can begin to be grouped to form categories of description using these quotes from the data as illustrated examples.

*"As the meanings of categories begin to form, those meanings determine which quotes should be included and which should be excluded from specific categories. The process is tedious, time-consuming, labor-intensive, and interactive. It entails the continual sorting and re-sorting of data. Definitions for categories are tested against the data, adjusted, retested, and adjusted again. There is, however, a decreasing rate of change, and eventually the whole system of meanings is stabilized." (Marton, 1986, p. 43)*

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In her model, Bruce refers to this process through the third phase (Comparison), fourth phase (Reflection (level 2)) and the fifth phase (Condensation) with the intention of getting to a point at which the data is condensed to such a position at which the conceptions represent meaningful variations which can then be grouped. Phases six (Explication) and seven (Categorisation) are the point at which categories of description are formed. The first of these two phases involve a process of reviewing conceptions and beginning to “explain the essence of the similarities and differences in regard to various conceptions within each domain of inquiry.” (Bruce, 1994, p. 118) until such point as the categories of description are fully formed.

This whole process took four months of intensive analysis. The transcripts were imported into AtlasTi, a qualitative data tool which provides mechanisms for managing the data and analysis of it.

Each of the three research questions were given a unique colour and as each transcript was analysed they were coded with comments and quotations and assigned the colour to indicate to which research question they related. The initial coding resulted in over 320 codes which was ultimately reduced to fourteen categories of description across all three research questions through this iterative process. A key aspect of this was working through the data one research question at a time, then collectively until the data was reduced to such a point as to show variation of experience in the context of each research question. “These categories are considered to represent the content and form of conceptions of the phenomena together and to summarise a more extensive specific content.” (Svensson, 1997, p. 168).

The resulting categories of description are summarised below but discussed in more detail in a chapter seven.

*RQ1a: What distinct qualitative factors can be derived from the nuanced experiences of academic staff in their professional development through the application of TPACK?*

- 1E Development through external Activity
- 1D Development through internal Activity
- 1C Development through support
- 1B Development through resources.
- 1A Development through conversation

*RQ1b: What distinct qualitative elements can be identified through the experiences of academic staff in how they discern and strategise their professional development planning within the TPACK framework?*

- 2E Development for curriculum enhancement.
- 2D Development for student experience.
- 2C Development for career enhancement.
- 2B Development for upskilling.
- 2A Development for requirement.

*RQ1c: What inherent qualitative factors contribute to the diverse ways in which staff perceive and engage with TPACK as a framework for professional development?*

- 3D TPACK as context connected forms of knowledge.
- 3C TPACK as integrated forms of knowledge.
- 3B TPACK as intersections of forms of knowledge.
- 3A TPACK as a single form of knowledge.

In this sub section I have outlined my approach to data analysis within the context of a phenomenographic study, ensuring that my approach is both aligned to the conventions of the research method and ultimately resulting in categories of description which represent the full variation by which participants have experienced the phenomenon, with a summary of the

results. In the next sub section I will specifically discuss issue of validity and reliability so as to ensure that the results of this data are both critically sound, but also of use to future studies.

### **6.5 Bracketing for data validity & reliability.**

In the sub-sections above I have articulated the way in which I have approached the research, in particular the way in which I have identified the participants, collected the data and analysed it.

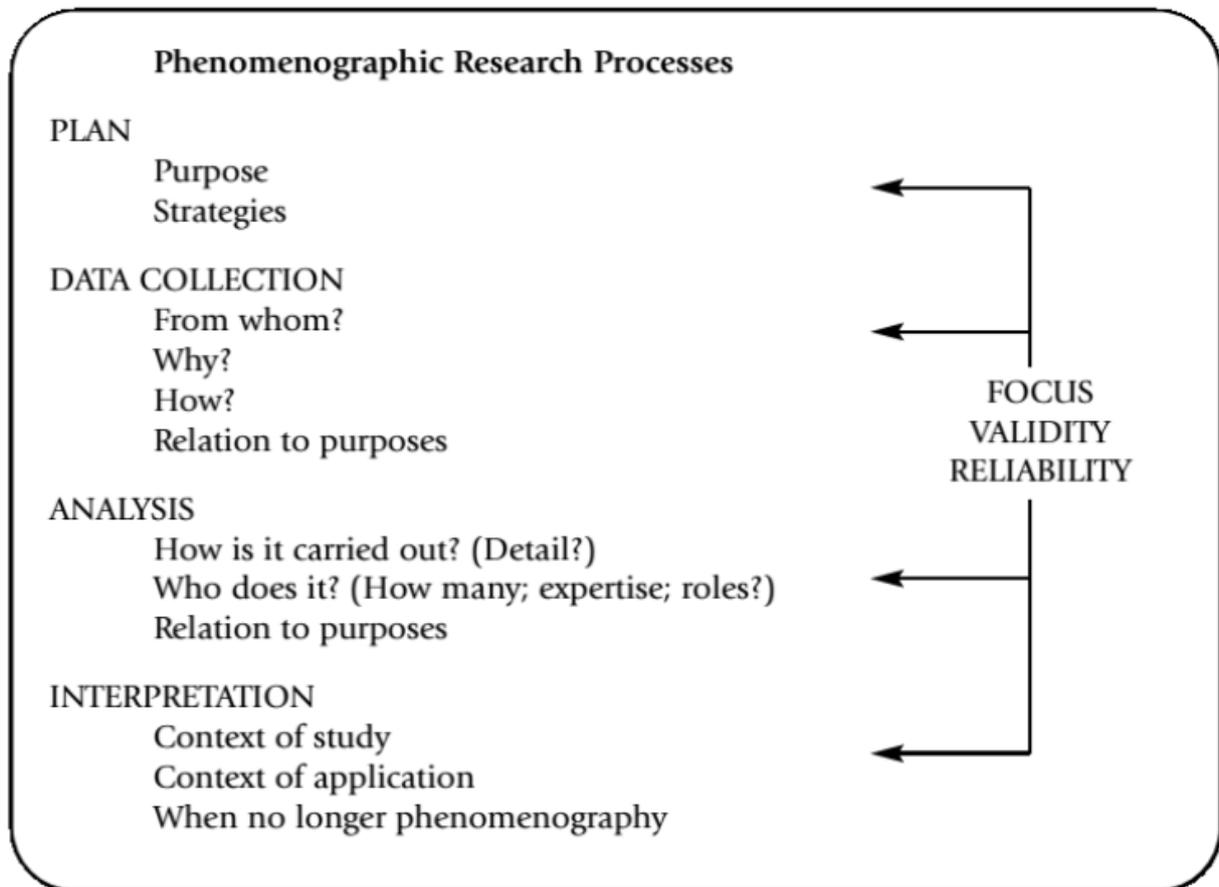
This goes some way to ensuring that the data and associated outcomes are both valid and reliable in the context of this study. However, it is necessary to more specifically discuss how I have ensured that this study is both a valid and reliable representation of the participants' lived experiences. Cope (2004) suggests that "unless scientific approaches to validity and reliability are addressed in qualitative research and the responsibility for rigour is accepted by a researcher, the research can be considered unscientific, invalid and unreliable," (2004, p. 5) and as such "a reconsideration of validity and reliability in phenomenographic research would seem appropriate" (2004, p. 8).

However, since the outcome of phenomenographic research is not statistical, but rather conceptual, the focus of attention for the validity and reliability is very much situated on the process and "adherence to the tenets of research design, data collection, analysis and reporting establish credibility" (Barnard et al., 1999, p. 122).

As presented in the sub-section above, using established processes such as Bruce's eight stage model for analysis (Figure 15) helps to ensure that this aspect of the study can be considered as reliable and valid by the very nature of the fact the researcher "has implemented the procedures faithfully", additionally the outcome of the study is a true and accurate representation of the variation of experience as presented by the participants.

Bowden & Walsh (2000) propose that reliability and validity and an embedded feature of phenomenography, in so much as the researcher must consider their approach at every stage of the research.

**Figure 16 – Phenomenographic Research Process**



Note: Phenomenographic Research Process From Bowden, J. A., & Walsh, E. (2000)

Phenomenography. In *Phenomenography*. (p7).

However, it is perhaps the interview and analysis stage, with the formation of the categories of description where the validity and reliability requires specific consideration and so the critical point here “centers on the ability of the lone researcher to bracket his or her own perceptions of the phenomenon when creating categories” (Rands & Gansemer-Topf, 2016, p. 13) and it this aspect of the process which I wish to discuss in more detail.

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Bracketing as a concept originated through Husserl's philosophical development of phenomenology (as discussed in an earlier chapter). Phenomenography borrows many aspects of its methodology from phenomenology and in particular the use of interviews as a mechanism for exploring individuals' experiences. In phenomenology "researchers use bracketing as a method of demonstrating the validity..... of the data collection and analysis process" (Chan et al., 2013, p. 1) and whilst more prevalent in phenomenological studies it has influenced and is applicable to phenomenographic interviews where "the rule of the epoche, or 'phenomenological bracketing', involves putting aside preconceptions about the phenomenon" (Bruce, 1994, p. 49) so as to ensure that the interviewer is able to 'detach' themselves from the participants and their experiences so as to ensure that categories of description are truly representative of the variation of participants' experiences.

The purpose of this is to avoid bringing any preconceptions into the interview or analysis stages and "ignoring all existing knowledge about a phenomenon so they (researcher) can grasp its 'essential elements" (Matua & Van Der Wal, 2015, p. 23).

Ashworth and Lucas (2000) propose that the following aspects must be bracketed so as to avoid presupposition:

- importing earlier research findings;
- assuming pre-given theoretical structures or particular interpretations;
- presupposing the investigator's personal knowledge and belief;
- assuming, prior to acquaintance with the nature of the experience itself, specific research techniques;
- the researcher's concern to uncover the 'cause' of certain forms of experience.

Therefore, as a phenomenographic researcher it was integral to the validity and reliability of this study that I was able to make use of 'bracketing' to ensure authenticity of the data.

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Whilst there is no definitive guide as to how to undertake bracketing, I have undertaken the following process to ensure as far as reasonably possible that I have bracketed any presuppositions prior to undertaking any data gathering or analysis:

- Avoided bringing any previous studies or theories to bear on any of the interview questions or data analysis (I have not used prior studies of this nature to shape my research questions or dictate my study approach).
- Set aside my own beliefs or conceptions in relation to the phenomenon or the participants experiences of it. (I have not myself undertaken the exercise that this phenomenon is based upon as a participant).
- Approached the development of the interview questions with critical reflection and independence. (Made explicit use of open ended questions, approved in discussion with my supervisor).
- Used a cyclical data analysis process to maximise the validity and reliability of the data and to ensure authenticity of voice of the participants. (Use of established practices for ensuring that categories of description are derived from the participant lived experience data).
- Ensuring that no hypotheses were established prior to undertaking the research. (Consideration for the appropriate research questions prior to starting any research and validated by research supervisor).
- Situate the research activity within the lived world of the participants (All interviews took place in a neutral space on the campus where participants worked but not in their offices).

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These approaches helped me to 'bracket' myself in such a way as to maximise the validity and reliability of the data in the context of this phenomenographic study and remain loyal to the principles of the second order reality of the participants' experiences.

However, as Ashworth and Lucas summarise, "the attempt to bracket will only be partially successful. Some ways of viewing the world are likely to be more difficult to set aside than others. Thus, it is of practical importance to consider how personal views and beliefs can be set aside." (2000, p. 299) and so consciously acknowledging these challenges of presupposition and seeking to address them is integral to the validity and reliability of the data.

In the context of this study, whilst I was familiar with the TPACK framework, having been introduced to it as part of my PhD studies, I had not been familiar with its use in a higher education setting prior to this. Whilst this study took place at the institution where I used to reside I subsequently moved to another institution after which all the interviews took place. Additionally, I have never directly worked with any of the participants who volunteered for this study, although I am aware of some of their work. It was therefore imperative that any views I may have held in relation to the participants did not influence my data gathering or analysis. In order to address this each participant was allocated a unique letter and once the transcription had been undertaken this was anonymised before any data analysis took place. So, during the analysis phase I was not able to directly attribute comments or quotations to specific people as they were entirely referenced by their participant ID.

## **6.6 Ethical and data security considerations.**

As with any qualitative study ethical considerations must be at the forefront of any research activity. This sub-section outlines the ethical considerations in relation to this study and also provides an overview of the processes in place to ensure data security and confidentiality.

*Ethical issues are present in any kind of research. The research process creates tension between the aims of research to make generalizations for the good of others, and the rights of participants to maintain privacy.” (Orb et al., 2001, p. 93).*

Therefore, it is essential that research ethics principles and processes appropriate to the context of the study are followed at all times. This study takes place entirely within the UK and supervised at Lancaster University following their ethics procedure. The ethics application form was submitted and approved by the Faculty of Arts and Social Sciences and Management School Research Ethics Committee.

As this study involved human participants it was necessary to ensure robust processes were in place to protect the data and to ensure anonymity of data.

Through the United Kingdom Research and Innovation (UKRI), the Economic and Social Research Council identify six principles of ethical research in social sciences:

- research should aim to maximise benefit for individuals and society and minimise risk and harm
- the rights and dignity of individuals and groups should be respected
- wherever possible, participation should be voluntary and appropriately informed
- research should be conducted with integrity and transparency
- lines of responsibility and accountability should be clearly defined

- independence of research should be maintained and where conflicts of interest cannot be avoided they should be made explicit.

(Economic and Social Research Council, 2021)

As previously discussed, the selection process was based on those participants who had already participated in the TPACK workshop and associated activities. They were all invited (via email) to volunteer themselves via an online form to which only the researcher has password protected access. The email provided all details of the intended research and their role as participants within it. The only personal data collected was their work email address, in order to be able to communicate with regards to their involvement in the research.

Once participants were selected, they were provided with a participant information sheet and required to give informed consent before being interviewed by signing a consent form. These forms were then scanned and stored electronically in a password protected folder to which only the researcher had access. The physical form was then be destroyed (shredded). Prior to the interview taking place the participants were again provided with the participant information sheet which included an overview of the research, details of how their participation will form part of the research and also details of how their research data would be handled and asked to verbally confirm their understanding of participation in the study. Additionally, they were also provided with details of how they can withdraw from the research at any time and request that any data they may already have contributed be discarded. Participants were additionally invited to review the transcripts of their interviews but none requested to do so, however this approach did ensure multiple points of consent consideration were offered throughout the study and not just as a 'preamble' at the beginning, as is suggested in more precarious study environments such as social work and offers participants multiple points at which to consider their consent. (Shaw, 2008).

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No personal data was intentionally collected during the data collection process. However, during interviews some participants did refer to individual persons by name, including themselves and so all of this data was anonymised as part of the transcribing process to ensure that no personal data is carried through into the data analysis phase. For analysis and write-up purposes each participant was referred to as Participant A through to R. A single record of the participant email and their associated participant letter was stored in an institutionally managed secure online storage area and was password protected for access by the researcher (this particular data was only used in cases where participants wished to withdraw from the study so that they could be communicated with to confirm this had taken place).

All of the data was collected & stored on OneDrive for Business (managed by the institution at which the researcher is employed). Client communication with the server to OneDrive for Business across the Internet uses SSL/TLS connections. All SSL connections are established using 2048-bit keys. Locally stored data is also encrypted. Two factor authentication is also being used for access. One single mac laptop (which hard drive is encrypted) will be used to manage the data collection and retrieval which is additionally password protected. Where data is required to be transferred to Lancaster University for longer term storage a named person within Lancaster University will be provided temporary access to the data directly from OneDrive for Business which can then be transferred to local servers. It is not intended that this data will be stored beyond a 10 year period. The University of Lancaster ethical process was adhered to throughout the study and the nature of the study did not put any participants at risk.

### **6.7 Chapter summary.**

This chapter provided a detailed description of the approach taken with regards to the implementation of the research. The chapter describes in detail the process of participants

selection and how this aligns to accepted practices in relation to the research methodology. In particular I discuss the process of purposeful sampling to help ensure that as far as possible a finite amount of experiences can be presented without being too overburdened with data.

The data collection and analysis are described in detail, describing the way in which interviews were planned and data collected with particular reference made to the specific approaches adopted based on the methodology. The analysis phase of the research is described next and in considerable detail. This detailed discussion helps to validate the findings and ensure that the findings, which are discussed in the next chapter, are considered as being reliable. This validity and reliability is further supported by the description of the process of bracketing, a unique aspect of phenomenography but one which is vital in ensuring reliable and valid outcomes.

Finally, the chapter concludes with a description of the way in which this study has approached its ethical and legal responsibilities in relation to the participants and data. The next chapter presents the findings of the data and naturally leads on from the research implementation as a direct output from the implementation activity.

## **Chapter 7: Research Findings.**

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### **7.1 Introduction.**

This chapter firstly sets out the research findings for research question one (separated into the sub questions) and presents these findings through the categories of description (conceptions) and outcome spaces, as previously described in Chapter 5. In total, fourteen conceptions were identified across the research sub-questions and these are presented through three associated outcome spaces. Each outcome space is graphically presented and represents the variations by which participants have experienced the phenomenon and the hierarchical relationship between those conceptions within an outcome space. Additionally, the findings and outcome spaces are further analysed so as to address research question two, and the extent to which these findings suggest that the experiences of using TPACK supports a more holistic approach to academic development.

### **7.2 Categories of description relating to research question 1a.**

This sub section presents the findings of the data analysis aligned to research question 1a:

*What distinct qualitative factors can be derived from the nuanced experiences of academic staff in their professional development through the application of TPACK?*

It sets out the qualitatively different ways in which academic staff have experienced professional development in the context of using the TPACK framework for exploring and mapping their professional development. Five categories of description were identified via the conceptions that emerged through the analysis of the transcripts, which subsequently form a hierarchical outcome space. Each conception is described below and supported with quotes from the interview transcripts.

#### **7.2.1 Description 1A - Development through informal conversation.**

A number of participants referred to development experiences in relation to ad-hoc conversations or peer to peer meetings with colleagues within and outside of their departments.

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These were often unstructured and unplanned, predominantly associated with problem solving and sharing practice or experiences. In the context of TPACK, within a department these were often linked to Pedagogical Knowledge and Content Knowledge (PCK) whilst conversations with colleagues outside of the department related to Pedagogical Knowledge (PK) and Technological Knowledge (TK) (TPK). This conversational approach was often an informal mechanism and sometimes presented itself as a passing comment in the interview data, but through the coding process it emerged as a distinct but collective way through which participants experienced development by enhancing their understanding and knowledge of areas of interest.

Some participants identified experiences through direct conversations relating specifically to the TPACK framework activity, drawing upon their experiences, and discussing them with others conversationally.

*“to discuss with others about what their understanding of these are [TPACK domains] and what the nexus of these various things might be.” - Participant B*

These conversations around TPACK as a framework supported participants understanding of it and thus their ability to engage with it. Their experiences of conversations such as these were as much about the framework itself as they were about their development and understanding of using it. Other participants related their conversational experiences to identifying potential opportunities for academic development and as a starting point for seeking out and planning development future activities.

*“so a lot of our conversations were around identifying maybe baby steps, that they felt my knowledge could help to oversee and mentor in some ways.” - Participant D*

*“you get to talk to your fellow staff and you think, wow, that's really interesting. Why are they doing that? We aren't. Or, I'd like to engage in that” – Participant H*

Conversations with their peers about their knowledge and experiences helped others identify gaps in their own knowledge and seeking further conversations or development to fill that gap.

Additionally, some conversational development is referred to collectively over a longer period of time, not necessarily the specifics of the conversations but more in recognition of the way in which these conversations are collectively considered as being developmental.

*“several of us who'd done a lot of years teaching, having those sort of [pedagogic] conversations and reading around that research” - Participant J*

*“and long conversations about, well, why couldn't they do this or what wasn't working How do we handle problem team members? And that sort of thing.” - Participant J*

‘Conversation’ as a non-specific developmental experience was regularly experienced by a significant number of participants and whilst no participant with this conception experienced development solely through conversation, it was evident that they had all reflected on those conversational moments and consider them to be directly connected to their overall experience of professional development and was distinct to other experiences of development and as such emerged as a unique variation.

### **7.2.2 Description 1B – Development through resources and information.**

These conceptions relate to the use of a range of information and resources as an aspect of self-development, this being development that is almost always initiated by and co-ordinated by the individual and ranges from instructional YouTube videos to published articles relating to educational and curriculum development. In a number of cases the participants self-identified these resources, but there were also examples where specific resources were identified by a 3<sup>rd</sup> party and the participant was directed to them.

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The dominant resource referred to was that of scholarly published articles in support of learning and teaching, often associated with pedagogic development, but also including aspects of technological development.

*“reading is the way in to me in terms of that, so I’m reading a paper that a colleague might send me “have you read this?” – Participant P*

Again these peer to peer interactions influence the way in which staff access their development. In the case of accessing resources and information these are often cited as recommendations or in some cases seeking specific resources to help support a particular issue such as improving feedback.

*“we've found that in the reading we've done we found that recorded feedback was considered to be better for students” – Participant O*

They also included a mixture of both internal and external sources including sector bodies and organisations as well as publicly available video resources.

*“ We've got lots of [internal] online guides to help us use those tools.” – Participant B*

*“I go through that route because it's quicker and easier. I find sometimes it's just as easy for me to learn or something off YouTube.” – Participant G*

The way in which staff identify and access resources is varied, but there is a distinct experience of making use of resources for professional development.

#### **7.2.3 Description 1C - Development through support.**

These conceptions relate specifically to instances whereby participants have reached out to others directly for support. In the context of professional development these are more likely to be pre-arranged and associated with where an individual has identified a particular need that they are seeking support for, either immediately (telephone support) or over a period of time

(email support or organised meetings). This support might be through a peer-to-peer interaction or through a dedicated support service within the institution, but in each case it is instigated by the participant in order to direct that support at specific area of development. Seeking support type development through telephone conversation was particularly prevalent with nine of the sixteen participants making reference to telephone-based support (often through a central service).

*“[what] I'm very good at is asking for help when I don't understand things so I'm not constantly on the phone to learning systems but I'm on the phone a lot and I find them extremely supportive and helpful and knowledgeable” – Participant Q*

Additionally, seeking support from colleagues (peers) was also observed, both from a single request to a more structured mentoring arrangement, thus building a longer-term relationship for support.

*“I asked somebody in my team to help me on a one-to-one basis to do the most basic things” – Participant P*

The unique aspect of this conception is that the focus of the development is very often related to a specific point in time to solve an immediate need. Although the nature of the support was often dialogic this conception differentiates itself from 1A as being a consciously actioned event, specifically reaching out to individuals or teams to support an action or activity, it is not conversational in the sense that it is a more formal approach to seeking support.

#### **7.2.4 Description 1D - Development through internal activity.**

As discussed in previous chapters, institutions have established a number of mechanisms to support the development, particularly digital skills, of their staff. This conception was strongly represented throughout the interview data, with all participants making reference to an internal structured development activity as part of their experience of professional development.

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It is useful to note at this point that many participants referred to 'DEAP' (Developing Excellent Academic Practice) which is an internal (to the institution where this study is based) term for a series of development activities taking place in this institution throughout the year, but culminating in the DEAP conference (an annual learning and teaching conference). DEAP references present themselves often as part of participants' development experiences are clearly influenced by an institutional approach from the Centre for Learning and Teaching.

*"another would be through going to DEAP Fora or DEAP conferences or other sorts of activities"* – Participant B.

*"I feel like the only time I ever really get to develop any sort of pedagogy is through DEAP"*  
– Participant G

The DEAP events evidently form a key element for this conception, what with it being designed as an academic development programme specifically with a remit to support both pedagogical knowledge (pk), technological knowledge (tk) but also uniquely technological-pedagogical knowledge (tpk) as articulated through the institutional Centre for Learning and Teaching (CLT).

*"The Centre for Learning and Teaching is the principal academic service in our University that supports and guides academic staff, individually and collectively, to develop excellent academic practice (DEAP). We provide expertise in all aspects of H.E. such as curriculum, research-informed teaching, learning, assessment and feedback, face-to-face, digital and blended H.E. pedagogies." - <https://teachlearn.leedsbeckett.ac.uk>*

Additionally through CLT, the institution also has its own Advance HE accredited fellowship scheme and this too was a strongly featured in the interview data, although more often referred to in its previous guise as the HEA (Higher Education Academy) scheme as many of the

participants would appear to have completed it a few years ago prior to the Higher Education Academy transitioning to AdvanceHE.

*“I think as my career progressed I think the more formal aspects that the HEA (Higher Education Academy) stuff I suppose is the most obvious example to point to” – Participant C.*

*“Through the HEA, senior fellowship, was really important” – Participant G*

These internal experiences form a critical component of staff academic development of which the internal process for gaining AdvanceHE fellowship is a dominant feature of those experiences with every participant mentioning it in some form or another through their interview.

The Centre also had responsibility for the internally delivered Postgraduate Certificate in Higher Education (PGCHE) to which four participants made specific reference to as part of their development experience (noting that not all staff will have been required to complete the PGCHE).

*“I think the PGCHE actually was a major, major contribution to that. Definitely.” – Participant M*

Although the majority of internal development experiences referred to were those run through CLT some participants also made reference to internal development run by other departments of the University, such as the leadership development programmes run by organisational development team in human resources.

*“I mean, having a PDR, I have HEA senior fellow. All kind of the some of the key things that the university and the department here have available, the Aurora reprogramme.”*

Participant I

*“I think a lot of the development I've had has been.....more about my role in terms of leadership development, management development.” – Participant P*

Examples of development experiences which are offered to both academic and professional services teams were significantly less evident throughout the interview data, but where they existed it was clear they did benefit participants in undertaking their academic duties.

Participants also referred to internal obligatory training, largely associated with health and safety or data protection. Whilst not specific to academic staff and not specifically related to the TPACK framework it was certainly a component of internal development that participants made reference to, particularly in relation to their motivations for undertaking development, the findings of which are presented through research question two in the sub-section below.

Internal development activities are prevalent throughout the interview data and in the main are associated with both pedagogical knowledge (pk) and technological knowledge (tk) although the leadership development referred to was often in reference to the leadership of a subject area so also touched upon content knowledge (ck) indirectly.

### **7.2.5 Description 1E - Development through external activity.**

This final conception, in relation to research question 1a, is where participants collectively experienced development through external activity when exploring that through the TPACK framework. A large majority of these related to development of subject expertise, or content knowledge (ck) as defined in the TPACK framework. In most cases these were subject specific conferences and in one case a subject specific educational conference which would align to pedagogical-content knowledge (pck) within TPACK.

*“so I've just been at a conference this last week which is around digital art recently there was a graphic design educators network conference” – Participant C*

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Conferences were the most prevalent external development activity which emerged through the data and predominantly subject related, although a few participants did refer to pedagogical conferences. In addition to the conference activity a few participants, from more vocational subjects, also made reference to external experts/practitioners through which they experienced external development.

*“ We got an external [subject] expert in to give us a series of workshops.” – Participant A*

One participant made specific reference to external higher education agency events in their role as an educational development lead for the institution.

*“going to events like Advance HE events, SEDA (Staff and Educational Development Agency) things and NTF (National Teaching Fellow) events” – Participant A*

Participants with this conception identified and recognised their experiences of development as being provided through an event or activity that was external to the institution. Interestingly this conception was not as prevalent as conception 2D (internal activity) in the interview data, this is perhaps rationalised through the fact that external activities often required funding (usually departmental) which therefore meant a cost was incurred and is summarised as an experience through the quote below;

*“So you can spontaneously go to an internal workshop here on some weird newest qualitative thing and you've done it in half a day and it's usually free. Whereas if you do a executive development program with Higher Education Academy we could not have afforded to go unless we got two the price of one, so, resources particularly currently are a very very tight and internal development is often the only way you can go so this resource impacts on your decision making around development.” – Participant A*

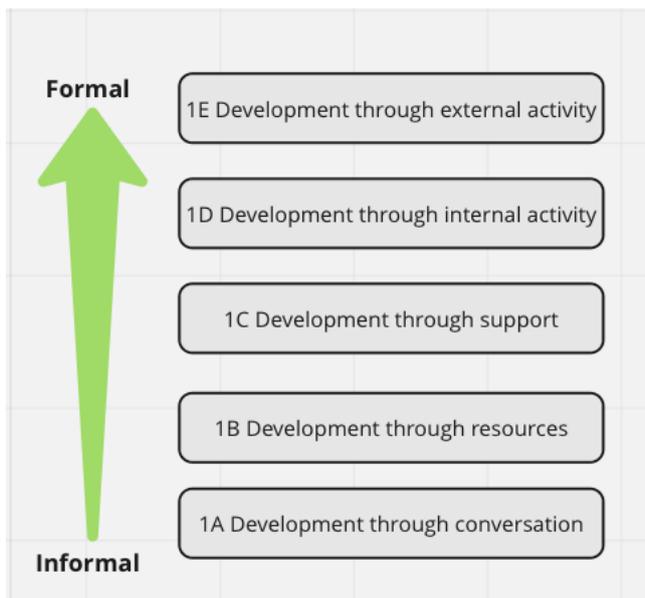
It is therefore possible to determine that opportunities for internal development are more prevalent and accessible than those for external development activity and as such were more commonly referred to during the interviews and although it is not the intention of this study to examine the barriers associated with engaging in development activities it must be acknowledged here that cost is a limiting factor in relation to this conception.

### **7.2.6 Outcome space for research question one.**

As previously described in Chapter 5, the purpose of phenomenography is to examine the lived experiences of participants which are represented through the categories of description.

Additionally, phenomenography seeks to understand the relationship between these categories of description which is presented (usually graphically) through an outcome space (Figure 10).

**Figure 17 – RQ1a Outcome Space**



Note. Outcome space representing categories of description for research question 1a.

This relationship between categories of description is presented hierarchically in order to fully understand the ways in which participants have experienced the phenomenon.

*“the qualitatively different ways of experiencing a phenomenon constituted during a phenomenographic analysis would typically represent more or less complete*

*understandings of the phenomenon, rather than different and unrelated understandings.*

*These different understandings may then be ordered in terms of complexity or completeness.” - (Akerlind, 2005, p. 7).*

Therefore, it is possible to present a hierarchy of experience in relation to the formal nature of that experience, in line with the findings presented above. The role of formal and informal learning have been studied both within education (Ainsworth & Eaton, 2010; Folkestad, 2006; Greenhow & Lewin, 2016) and additionally in the workplace (Manuti et al., 2015) and is broadly described as informal being learning that is not specifically prepared or structured beforehand (for example by a teacher) whereas formal learning has been prepared in advanced and structured in some way by a teacher or other person (Folkestad, 2006).

Therefore, in the context of this outcome space the associated informal experiences are those with minimal or no prepared structure through to formal experiences which would normally be planned well in advance with structure and delivery by a third party.

Conception 1A is certainly the most informal interaction, based on ad-hoc conversation and more often than not without pre-determined structure or planning. Staff who presented an experience through conception 1B (development through resources) would often do so without any formal support and in an ad-hoc manner, but with a focus on completing a specific task or activity whereas conception 1C relates to participants experience that would seek out some more formal support through established mechanism and activities linked to institutional structures and processes. Conceptions 1B (internal activity) and 1A (external activity) would by their very nature be considered to have the most structure and preparedness and as such hierarchically the experience will be more formal. Whilst 1B and 1A will have similarities, the very fact that 1A relates to activities external to the institutional adds an additional element of

formality, particularly in relation to conference attendance where these experiences are highly structured and require the formality of registration and often an associated payment.

Some of this hierarchical formality will come from the relationships which are prevalent within each conception. For example, conversations which take place as part of a development activity in 1E will almost certainly be those with whom participants have close established relationships (e.g. course team, departmental peers) whereas relationships in the context of conception 1A will likely operate at a much more formal level where familiarity with others will be significantly reduced. The outcome space therefore represents the hierarchical variation of experience for academic staff in relation to their professional development through using the TPACK framework.

### **7.3 Categories of description for research question 1b.**

This sub section presents the findings of the data analysis in relation to research question 1b:

*What distinct qualitative elements can be identified through the experiences of academic staff in how they discern and strategise their professional development planning within the TPACK framework?* It presents the findings in relation to the qualitatively different ways for which academic staff undertake professional development activity when using the TPACK framework.

Five categories of description were identified through the analysis of the transcripts which subsequently form the hierarchical outcome space. Each conception is described below and supported with quotes and summaries from the interview transcripts.

#### **7.3.1 Description 2A - Development for requirement.**

This first description categorises conceptions which represent experiences whereby development activity is undertaken as a requirement. Some of these are institutional requirements which wouldn't immediately fall within domains of the TPACK framework, although they may be indirectly linked and form part of the overall development experience of

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academic staff. Most often referred to are the health and safety required course which form part of the required development of all staff.

*“So we get all this stuff on iTrent [internal human resources system] about providing health and safety and things which are statutory requirements - Participant Q*

Some participants acknowledged the expectation of having some of their development as being institutionally required of them, whether this be a legal requirement, a regulatory requirement or a specific institutional requirement.

*“there's been some things which you are obliged to do” – Participant C*

In some cases the required development is also linked to specific course or department development requirements which may be related to professional bodies, accredited courses, or local health and safety for laboratory use, or vocational courses where academic staff may also have to be a registered practitioner (e.g. physiotherapy).

*“So we used to have to have regular in-service training and get it stamped off.” – Participant A*

In these cases these experiences are driven by an extrinsic motivation, identified as a necessity and engaged with as part of a compliance need. They are not often described in a developmental sense but in a “tick box exercise” manner and although participants see this as a component of their development experience they rarely see it as developmental.

*“The motivation for doing it [accreditation] sometimes is because you have to.....You've got to do this, you've got to do these things.....Oh well all right then I will” – Participant K*

### **7.3.2 Description 2B - Development for upskilling.**

A number of participants described experiences of identifying development needs based on developing specific skills for a task or activity (upskilling). This approach often connected with conception 1B (development through resources) and 1C (development through support) whereby participants identified both an upskilling need and a resource or support mechanism to then complete it.

*“So I think about things that I need to achieve and the skills I need to get there.” –*

*Participant L*

This development experience often surfaces in the interviews in relation to prioritising the things which need addressing soonest, and the limited time available to undertake development, as has already been observed in a number of previous reports discussed in chapter 2. It was clear that a number of participants prioritised their skills development based on the sense of urgency as a direct consequence of having limited time.

*“self-development then becomes but how can I develop myself only in relation to those things that are right in front of me right this minute in time.” – Participant G*

In a number of cases these were directly associated with very specific activities within the context of the participants role such as enhancing their PhD research supervision skills, leading on a school academic integrity initiative or learning a new online synchronous teaching platform for new cohorts of online learners. In all these examples the development identified was specifically linked to a role where particular skills and knowledge were required.

Additionally, some participants experienced a less urgent approach to identifying any development needs, focussing on gaining skills in order to complete tasks, but those which were not necessarily as time urgent.

*“Thinking oh that's that be something that I could see working really well ..... I need to learn how to use that and find out more about it.” - Participant B*

This conception commonly represents experiences whereby skills development is undertaken as a necessity within a given role, thus the output of the resulting development is almost always for the purposes of supporting or improving their individual skills requirements and therefore this skill development very often focuses on benefiting the individual in terms of their role and associated tasks.

### **7.3.3 Description 2C – Development for career enhancement.**

The third category of description for research question 1b is that where participants are identifying development planning experiences which relate to their individual career development. In the majority of cases this an explicit reason for identifying and undertaking development in order to enhance academic career prospects.

*“I suppose to some extent it's to do with the way in which the career path is structured.....what I usually do is I kind of think about, well, first of all, some of my development is, as I mentioned, career orientated.” Participant L*

*“I suppose the other thing as well is that, um, for career progression, this is another stream, if you like, that that contributes to developing, both developing self and you've got to evaluate where you want to go, what you need to fulfil to get there.” - Participant M*

Participants L and M made strong assertions that development opportunities were uniquely associated with their career plans and trajectory. Both participant L and M made reference to Professorial positions, one in relation to research and the other in relation to teaching and learning. What was apparent was that in both cases development was often prioritised based on its likelihood of supporting career progression.

Some participants also referred to development experiences in relation to it benefiting them “professionally”. Although not as explicit in terms of having it being linked to plans for career progression, it certainly was about enhancing their career in a professional context. Additionally, other participants made reference to how they had identified development opportunities based on seeking to change direction in their career, so as to move away from their subject area into learning and teaching leadership.

*“an inspirational teacher, leader of learning and teaching joined the university and I wanted to work with them. So that took me in certain directions away from my disciplinary focus.....I think it's been driven much more now by me and that's just a matter of where you get to in your career.” - Participant P*

In identifying development needs some staff are clearly experiencing this in relation to their career planning and progression, more specifically some staff are prioritising development opportunities in favour of those which they perceive to be most beneficial for their individual needs. This is a unique variation of experience and one which suggests that the development for the benefit of ones own career is a key consideration in planning for academic staff development.

#### **7.3.4 Description 2D – Development for student experience.**

In this description participants begin to move towards development activity which more immediately benefits others, rather than self, and therefore having increased reach In this category it is development which is identified and planned in pursuit of improving or enhancing the student experience. Seven of the sixteen participants specifically referred to their motivation for development through using the TPACK framework being related to student experience.

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The majority of the staff made explicit reference to identifying development which supported aspects of the TPACK framework itself and the domains within it, but most often pedagogical knowledge or technological knowledge.

*“a constant trying to get better at pedagogy trying to improve student experience” -*

*Participant B*

*“So I think we're all clear that that we need to be making much better use than we are, of technology to enhance students experience of learning” – Participant B*

In some cases participants identify the need to develop themselves in way which sits at the interplay of TPACK domains, in this case TPK

*“ I think I do have ways of imparting pedagogical knowledge but I don't think I've got enough technology to do it in way that more young people can relate to it.” – Participant L*

In the majority of examples there is a mixture of both pedagogical knowledge (pk) development, technological knowledge (tk) development and additionally some technological-pedagogical knowledge (tpk) but rarely content knowledge (ck) which suggests that in relation to the student experience their subject expertise is already developed. Some participants on vocational courses do talk more specifically about the skills that students need, but not necessarily what they need to support that, although Participant H did implicitly link their own development planning to meeting the needs of students' skills development across a programme.

*“It's about what helps those students to actually emerge at the end of like a three-year course with the skills they need.” – Participant H*

A couple of participants talked about identifying development activity to more broadly support student experience activity whilst not explicitly linking that to any TPACK domain areas, with Participant I associating development with their own classroom confidence.

*“it's a mixture of my own professional development, feeling confident in what I'm doing in the classroom, wanting to explore new, being open to new ideas, but I also wanted to make sure that the students have as good an experience” – Participant I*

The very fact that a significant number of participants made reference to student experience suggests an institutional culture of placing student experience as a high priority for academic staff, given that a number of them specifically identify and plan development activities in relation to it, with a strong link with enhancement of the student experience to the use of technology, as experienced by a number of participants.

### **7.3.5 Description 2E – Development for curriculum enhancement.**

The number of participants who experienced development activity in this conception were not as numerous as those for student experience (2D) but the variation of experience was distinct and separate from others and directly linked to course or curriculum enhancement activity.

*“I think back to the last course developments, we did it. You know, there are very definite statements about the use of technology, pedagogy and content” – Participant J*

These development experiences are both process driven (i.e. a requirement to seek validation of a programme) and also developmental (i.e. learning and developing as part of fulfilling the process). Participants often experienced this conception through the lens of general holistic course/programme design activity but sometimes experienced this more through a specific activity to enhance the course such as a course level approach to using rubrics.

*“how we can embed rubrics and what the benefit of them was ..... I felt that was really useful to a lot of us and it helped us all to think actually as a course.” - Participant I*

Occasionally participants also related their SFHEA (Senior Fellow of the Higher Education Academy) development experience to curriculum enhancement, again making reference to this in the context of course design.

*“since then I took part in the SFHEA process which was really interesting made me think about a bit more about course design and that sort of thing curriculum design” -*

*Participant O*

Whilst the majority of the participants referred to curriculum enhancement in the context of course design there were a small number of participants who specifically referred to curriculum enhancement experiences at a modular level

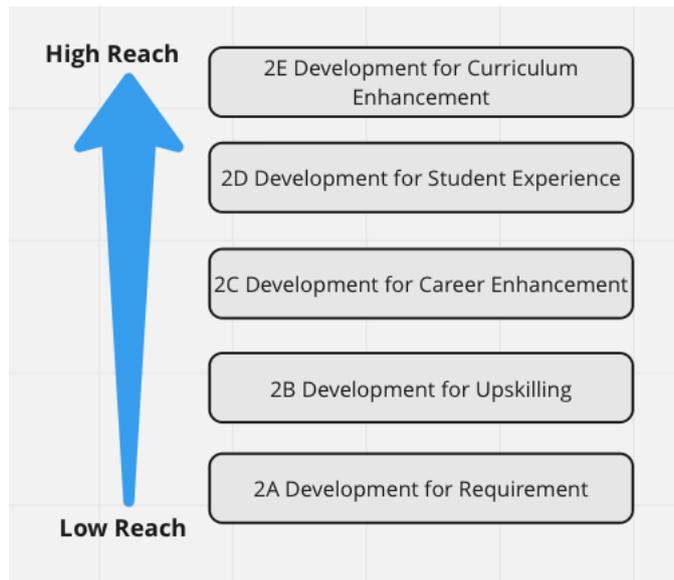
*I think at that point, when you're starting to look at the course provision at module level, that's where it starts sort of triggering a review of, you know, what development we actually need – Participant M*

In summary, conception 2E is drawn from the staff experiences which relate to aspects of improving the curriculum in some way. They experience their development needs in the context of both the module and course, with the ultimate aim of making improvements to it. It is collectively experienced by a number of participants and emerged as a distinct variation.

### **7.3.6 Outcome space for research question 1b.**

The hierarchical relationship that exists between the categories of description in relation to research question two are presented here in terms of the “reach” it will have and extent that the development will have impact on others, beyond the development activity itself benefit, as visualised in Figure 18. In the context of this outcomes space ‘reach’ can be defined as “the extent, spread, breadth, and/or diversity of the beneficiaries” (University of Galway, n.d.) and it is this definition which I have drawn upon for this hierarchy in consideration of the extent to which others benefit from the activity (beneficiaries).

**Figure 18 – RQ1b Outcome Space**



Note. Outcome space representing categories of description for research question 1b.

Therefore, the hierarchy is represented from the lower order development, which will have limited reach in terms of beneficiaries (low reach), through to the higher order development which will subsequently have a higher level of reach (beyond the initial activity).

The lowest category in this hierarchy is presented through 2A. This category represents development, which is required, often as part of a department or institutional need and as such has limited reach beyond the individual participant's undertaking of this development activity. Of the participants who experienced this variation none made explicit reference to how their development activity would impact others and as evidenced many experienced this development as mechanistic and as a requirement with minimal reach beyond themselves. This is most strongly voiced by Participant K who, as previously presented, is reluctant to engage in such development but is resigned to fact that they will need to complete it.

Conception 2B is where participants begin to more clearly present development experiences through which staff identify it as a mechanism for improving their skills and whilst still largely focussed on their own needs this category of description does subsequently move the planning

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of development into a process which is more voluntary compared to 2A. The majority of participants who experienced 2B presented this through development activities which addressed a specific area of perceived weakness, and predominantly in relation to their subject knowledge. The reach complexity now shifts the focus more to the development of oneself based on need, rather than requirement (as in 2A) often completed in relation to the role being undertaken at a given time. In this sense participants have moved from an experience whereby development activities have almost no perceived reach, to one where the reach has person impact and role impact which is then extended through category 2C where it was observed that participants experiences of planning and identifying development activities were situated around an individual's career enhancement activity, the epitome of development centred around and benefitting oneself, but with a reach that extends beyond the immediacy of the role. The reach hierarchy of the outcome space and the categories conceptions increases through 2D to impact and benefit others in an explicit and purposeful manner. 2D represents experiences where development is experienced in pursuit of impact (improving) the student experience. There is a clear shift from self-orientated 'reach' to development experiences which are both informed by the needs of others and is of benefit to them. Hierarchically, this reach is further extended through the final category of description in this outcome space, that being development for curriculum enhancement (2E).

Initially 2D and 2E were coded together but as further data analysis was undertaken it became apparent that there was enough variation between these experiences to split the coding into two distinct categories of description. Whilst within both categories staff identified development in relation to enhancing the learning and teaching experience in some way, and both may ultimately have benefits for the student, the reach associated with development for curriculum enhancement extends beyond just the students to also benefitting teachers of that curriculum as

well as wider quality enhancement benefits for employers and professional bodies. Therefore within this outcome space it is presented at the highest point of the hierarchy and is representative of experiences whereby participants identify and plan development for the purpose of curriculum enhancement, either as part of a formal process (validation or revalidation) or as an informal process.

#### **7.4 Categories of description for research question 1c.**

Research question 1c asks “*What inherent qualitative factors contribute to the diverse ways in which staff perceive and engage with TPACK as a framework for professional development?*” and seeks to understand the various way in which staff relate to using TPACK as a framework within the institution. This culminated in four categories of description with the hierarchical relationship being the complexity by which they integrated the forms of knowledge.

##### **7.4.1 Description 3A – Single form of knowledge.**

The lowest TPACK complexity is experienced through the single forms of knowledge that make up the framework, that being technological knowledge (TK), pedagogical knowledge (PK) and content knowledge (CK). Participants who experienced TPACK in this way presented experiences by which these forms of knowledge were considered in isolation to other forms of knowledge.

*At the moment I'm focussing on technology quite a lot with colleagues..... I want to make sure that we've got a consistent approach to rubrics and MyBeckett [institutional VLE] and stuff like that. – Participant I*

In this example Participant I makes reference to the fact that their focus for development at the moment is technologically focussed, seemingly divorced from other forms of knowledge in the context of TPACK and situated around a single knowledge form. Furthermore, they go on to suggest that even within a single form of knowledge there can be further segregation of development activity. Even though it could be argued that the use of rubrics has a pedagogical

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and content knowledge element to it the participant sees this as a technological development activity, divorced from other TPACK knowledge forms. A number of participants referred to technological knowledge development as an isolated activity, in so much as providing them with a list of knowledge “gaps” would be an ideal way for them to understand their development needs and be able to “tick” them off in isolation from any pedagogical or content knowledge development.

*“Where are your gaps in your knowledge. I mean this technology one, God that would be great to have a little checklist of all the things” – Participant I*

These indicate that the participant is experiencing TPACK at the lowest form of complexity, isolating the forms of knowledge and experiencing the framework in such a way as to see each independently from the other. Similarly, Participant P experiences forms of knowledge in isolation to each other, observing that;

*“I felt that a lot of people in that group and in other groups have equally allowed the technological knowledge to become outdated.” Participant P*

This is an example of where participants’ experiences are presented as using single forms of knowledge, almost as a mechanism for the evaluation of the development needs for others.

Even where participants experience TPACK through multiple knowledge forms they often present them singularly as distinct components rather than integrated through sub-domains.

*“You've got to have all three it would be no good being brilliant at that and brilliant at that without knowing the content knowledge.” – Participant K*

Whilst Participant K acknowledges the existence of all three forms of knowledge the experience they present is one of singularity in terms of their development. They go on to present an

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experience whereby they subsequently plan and identify development around the singular forms of knowledge.

*“because you think well okay I can tick the content knowledge box but it says to me I don't know enough there, technologically. And that pedagogical box as well is something I also need to address”. – Participant K*

Their approach to reviewing and mapping their development within the context of TPACK seems to suggest that they are entirely focussed on the separate forms of knowledge, despite the TPACK framework and the associated phenomenon they have experienced being predicated on the integration of these forms of knowledge. This is the least complex way to experience TPACK as it places development activity in singular domains and sees their development experience as a process by which to “tick” off the development activities against each form of knowledge.

In a similar way Participant O also indicates that their experience is centred around the single knowledge forms by attributing a percentage split by time in relation to their development activities and TPACK.

*“if we say 75 percent and then there's maybe 15 percent here which is given over to technology but it's given over in a really haphazard manner.....Really there's no connection for me unless I carve out time from my day there's no connection where that could be incorporated into pedagogical knowledge. I just thought I portrayed a really callous attitude to where abouts the excellence is in in teaching and learning so yeah I'd say 75 15 10.” – Participant O*

Here we see how Participant O presents the experience of their professional development based on where they spend their development time. The 75/15/10 they mention represents CK/TK/PK and they specifically refer to an experience where they see no connection between technological

and pedagogical knowledge development. In another example the participant frames their anxiety around a single form of knowledge (in this case Content Knowledge).

*“it was interesting that also revealed sort of anxiety about the content about the subject and about you know perhaps some of my anxieties about perhaps not being as developed in content knowledge as perhaps some of my colleagues are.” – Participant C*

This additionally supports the category of description already present in the outcome space related to RQ1b whereby this is an indication of the way in which development is seen as an upskilling activity, situated around single knowledge forms. However, this is not because the participant is particularly focussed on a single knowledge form, but the complexity through which they experience TPACK is low when compared to others.

*“So there's definitely things where it is very much about a technical knowledge that was building up, there was very clearly bits which were about pedagogical knowledge and teaching and learning side of things.” – Participant C*

Even when participant's describe development in relation to other forms of knowledge they still do so through the separate lenses of each TPACK knowledge form, thus experiencing TPACK at the lowest complexity within the outcome space and although experiencing and reflecting on development through single knowledge forms is common amongst all participants they do also experience TPACK in other connected forms.

#### **7.4.2 Description 3B – Intersections of forms of knowledge.**

Whilst not the most prevalent experience, it is clear that there are some participants who experienced the interplay of two forms of knowledge. This category of description increases complexity by presenting experiences whereby participants begin to merge single forms of knowledge into the intersections of the overlapping knowledge forms. In TPACK these present themselves as Technological Content Knowledge (TCK), Pedagogical Content Knowledge (PCK)

and Technological Pedagogical Knowledge (TPK) and are the interplay of two forms of knowledge. In some instances, this intersection of forms of knowledge are clearly articulated by participants through their own direct identification of a form or knowledge or a related aspect of a forms of knowledge.

*“Technological and the teaching and learning are sort of intertwined. I think it's sometimes quite difficult to separate the two out” – Participant C*

Participants often place significant emphasis on the intertwined nature of the technological knowledge (TK) and the pedagogical knowledge (PK) so as to recognise their dependency and influence on each. Despite Participant C not making specific reference to the framework's labelling of this as TPK, it is clear through this example that the participant experiences these forms of knowledge through the interplay of them. Those participants more familiar with the framework terminology are able to articulate this more clearly, using the language of the framework when talking about their experience.

*“I found it much more beneficial to spend a bit of time learning about the content of what I'm trying to do with the technical elements, which is why the technical content knowledge area is a little bit more larger in the time spent on it” – Participant D*

In discussing their experience of reflecting on their developing using TPACK Participant D has more clearly associated this with the interplay presented through the technological content knowledge (TCK). The same participant goes on to make further reference to the interplay of knowledge forms suggesting that they have both strong experiences relating to the interplay of knowledge forms, but also a good understanding of TPACK as a framework.

*“...by having a greater pedagogical knowledge, especially again pedagogical content knowledge, how they're (students) learning what they're learning would better influence*

*my ability to give better support knowing what they're learning and how they're learning it" - Participant D*

This interplay of the TPACK forms of knowledge shows an increasingly complex use of the framework to shape and reflect on their academic development activities, drawing upon the framework's philosophy of the interconnected and interdependent nature of the forms of knowledge towards a more holistic understanding of them. In some cases, although participants did not directly refer to the forms of knowledge, they have drawn upon their experiences of TPACK in making reference to their broader experiences. For example Participant G reflects more broadly on their experience of technology use and its relationship with pedagogy.

*"I feel like technology has particularly, in pedagogy, in education has a habit of promising a whole load of things and not really delivering" – Participant G*

In this example it is possible to see the language and influence of the TPACK framework extending beyond the initial experience of its use in direct relation to academic development, but more broadly as a point of reference to a participants experience of technology use in the context of their work, which indirectly correlates to their development experience. Additionally, participants present experiences whereby these intersections give rise to a realisation that these forms of knowledge of intrinsically connected.

*"it makes perfect sense when I look at it, doesn't it, sort of how technology can help with your pedagogy and makes perfect sense.....I think that's what you're going to try and understand. Technology and its contribution to pedagogy." – Participant I*

These experiences shape the way participants identify and converse with others about their development with increased complexity and in particular using the framework in this way to consider their own development needs.

*“the TPK bit here is saying, well, I needed a bit more time and that might be use, might've been a really useful vehicle for a conversation with managers or colleagues around or while just having a discussion. – Participant J*

The intersections with the technological knowledge (TPK and TCK) forms are particularly prevalent throughout these experiences and are perhaps indicative of the fact that the framework has been developed to build “on Shulman’s (1987, 1986) descriptions of PCK to describe how teachers’ understanding of educational technologies and PCK interact with one another to produce effective teaching with technology.” (M. J. Koehler & Mishra, 2009, p. 62) so there is an emphasis on technology integration which is inherent within the framework use that participants experiences are influenced by. This emphasis on technological integration is something which is also prevalent in the next level of complexity discussed below.

#### **7.4.3 Description 3C – Integration of forms of knowledge.**

As might be expected, the further increased complexity of the experience of using the framework is presented through the category of description which integrates all three forms of knowledge. Koehler and Mishra assert that the TPACK framework “allows teachers, researchers, and teacher educators to move beyond oversimplified approaches that treat technology as an “add-on” instead to focus again, and in a more ecological way, upon the connections among technology, content, and pedagogy” (2009, p. 67) and it is through the integration of these forms of knowledge that this can be achieved. Participants who presented experiences through this category of description demonstrate a more complex experience, one which indicates a deeper understanding of the value and purpose of the integration.

At the very least, participants who experience TPACK as an integrated framework acknowledge the existence of all three forms of knowledge working together.

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*“I tend to think of those in terms of the content as the what, the pedagogy and the technology as part of the how and why really” – Participant B*

This integration sees participants make use of the TPACK framework to holistically consider their development needs and to not see these forms of knowledge as separate to each other, either in terms of academic development or academic practice.

*“it is useful because it's a very clear visual reminder to avoid seeing it as, seeing technology as a nice to have or an add-on..... if we do them separately that's why we end up with those two extremes that I talked about before; either the technology drives a restricted approach or it gets, tries to get retrofitted in a way where it feels unsatisfactory.” – Participant B*

Not only is it possible to begin to see participants experiences deepen within the framework context but also see evidence of them consolidating this through reflection, drawing upon previous experiences and recognising failures of previous actions where TPACK was not a frame of reference for their work or their development. In particular a number of participants again make reference to the way in which their experience of TPACK supports a view that it is particularly effective at bringing in the “digital” element which has often been separate from professional development planning or activities prior to their use of TPACK.

*“ the potential if we use this framework is that staff will think about their digital capabilities and their digital skills as a more integrated approach to their pedagogy and also their content.....I suppose if you're using this framework as a development model, it's difficult to get away from the fact that you're thinking about the three areas together rather than thinking about them separately.” – Participant L*

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This prevalence of technological integration additionally builds upon those experiences also presented through the ‘intersections of forms of knowledge’ category (3B) with an increased complexity through the holistic consideration of all three core forms of knowledge.

Some participants seemed to experience their development, and reflect upon it, more holistically through the TPACK framework, moving from what might have been a lower complexity prior to its use to one which became increasingly complex in relation to TPACK.

*“What was really nice about it was recognizing that actually, technology does not have to be about pedagogic knowledge or technological knowledge I never really thought about it in terms of my own content knowledge for example and actually what as a result was that I came out looking for how those three things might start coming together.” – Participant G*

Here it can be observed that the workshop experience of using the TPACK framework has influenced a change in approach to academic professional development from one of single knowledge forms to one which is an integration. This suggests that there is the potential in using TPACK which helps academic staff move through increasingly complex experiences where their development planning, activities and reflection are more integration across forms of knowledge. This is articulated through participant’s own reflections of experiencing TPACK.

*“my experience is that people tend to come in and focus perhaps very heavily on content, because that's what they know and with time, they start to unpack maybe pedagogy, and in time becoming frustrated, then start to unpack what might be available as a set of tools with the technology as well. Then eventually come back to realizing that actually they're so inter-related you can't you can't do anything but use the lot together and not in a rigid way” – Participant J*

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These reflections by participants are indicative of a significant number of them experiencing TPACK in a more connected manner. Prior to its use their development was heavily weighted towards content knowledge but that through using TPACK there is more of an equilibrium between these forms of knowledge in terms of professional development.

*“It shows you the integration between the content and the pedagogy and the technology. It's not just one thing on its own and it sure, it's quite rich I think and quite deep rather than just this is a technology separately.” – Participant Q*

Referring back to the rationale for implementing TPACK as a framework in Chapter 4, it was based on “an observation that the digital development of staff within the HEI was often a low priority”, something which these experiences of its use suggest has at least been partially corrected through its implementation. Ultimately in this category of description the participants experience TPACK in a way which encourages integration by its very design, as was the intention of the original authors of it.

*“I guess in a way, yes, it has changed the way I approach it because I don't think about them separately. The Venn diagram gets me to think about them as integrated elements rather than separate.” – Participant L*

If this category of description represents the ultimate goal of TPACK, that being the consideration and understanding of each form of knowledge form equally and interconnectedly, it is then also desirable to have the development of academic staff considered equally. The experiences represented within this category articulate the value of such integration which is often a journey of discovery and realisation, one which encourages academic staff to consider their professional development differently to before, which is clearly presented through their own words presented in this category.

*“You know the content is very important, but the pedagogy is important and the TK [technological knowledge] is very important and I think would be extremely effective and I think all the universities should use it. Here, it should be kind of integrated and embedded” – Participant Q*

#### **7.4.4 Description 3D – Context connected forms of knowledge.**

Context is an often missing component of research into TPACK use (Rosenberg & Koehler, 2015) despite it being a visual element of the TPACK diagram (Fig. 3) represented by the dashed line which surrounds the Venn circles and whilst the “contexts” element was not explicitly referred to by participants what emerged through the coding process was a category of description whereby participants were experiencing TPACK whilst making specific reference to the contexts of those experiences. This category therefore represents the most complex of the experiences in this outcome space, whereby participants have deepened their own experience of TPACK beyond just their specific development activities into a wider context for how TPACK might be used.

One such context was the way in which participants experienced TPACK in such a way as to promote the use of it in the broader context of a longer term monitoring framework and as part of a formal performance development review (PDR) process.

*“.....using it as a tool to be able to have further conversations would be the way that I would see that it would be really useful. Ideally, you'd be working towards slight movement of it over say a year or two. I'd see it as might be a really useful thing to do for something like PDR.” – Participant O*

Drawing upon their experiences of TPACK a few of participants were able to consider its use in the wider context of their own development and that of others and make a connection between its use and the formal institutional PDR process. Even where this extension of TPACK into

broader contexts wasn't formalised it was still being proposed as a framework for less formal activities.

*"For example, the TPK bit here is saying, well, I needed a bit more time and that might've been a really useful vehicle for a conversation with managers or colleagues around or while just having a discussion. 'Why is that?. What else could I do differently? Do I need for more time? Am I working smart?'" – Participant J*

This suggests a move towards a more culturally embedded use of TPACK where it exists within a positive culture of conversation and discussion around professional development and it's clear to see participants experiences making connections between the TPACK framework and its use within the contexts they work. Even where a participant might refer to just a single form of knowledge they do so in the context of the use of TPACK as a mechanism for them to develop peer to peer models for supporting their development.

*"It's a bit scary going out there and trying to develop my pedagogical knowledge, when I don't know how and what to do, so having somebody that was like my 'pedagogical knowledge is really good I've had lots of experience with it, I can give you some activities like that that will allow you to achieve this and I've got experience with doing that and vice versa'" – Participant D*

However, these connected experiences of TPACK and wider contexts are not solely experienced through development conversations or discussion, but also through the practical application of the framework in a broader curriculum design context and process.

*"When we re-validated the international tourism management course. We made a really conscious effort, without realizing,.....to do exactly what's in there [TPACK] with the*

*target somewhere in the middle, that actually, that's where we want it to be” - Participant*

*J*

Experiences like this extends TPACK beyond the experience of it as a professional developmental framework to one which can be equally applied within the context of the curriculum design.

Participants who were able to present experiences of TPACK as context connected were not only able to articulate their experience of using the framework but then able to show a much higher complexity of experience by proposing and reflecting on experiences of its use as an extension of the wider contexts through which their lived experiences are shaped. Perhaps the most articulate and complex of these context connected forms of knowledge is best represented through this experience:

*“It doesn't start from the position of the institution it starts from you as an individual and I think that's what's really nice. For me it democratises that space. I wonder if that's something that might be useful for sort of when the institution is working for individuals maybe it should start from that space.” – Participant G*

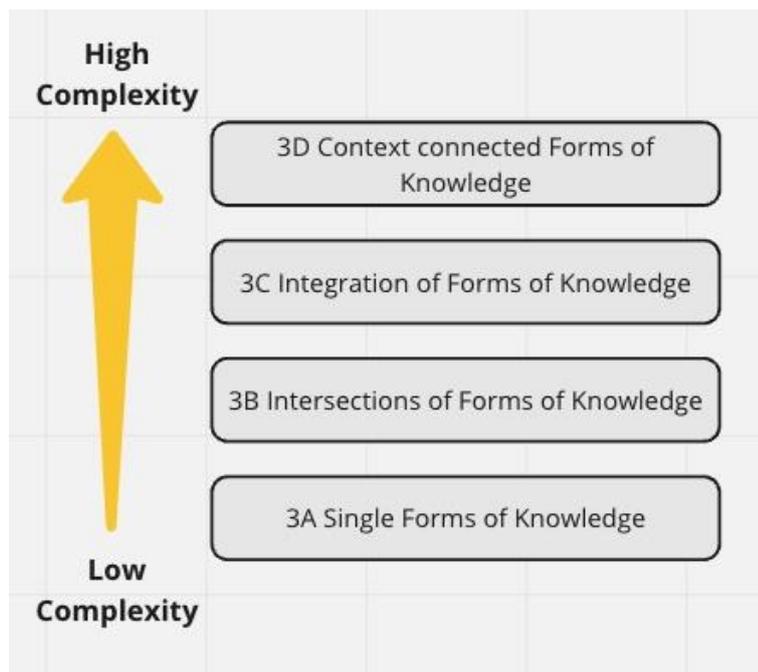
The prospect that TPACK, within the context of an institution, might be a framework which supports the democratisation of academic professional development is a powerful concept and one which extends to a range of contexts that exist within the broader cultural and hierarchical structures of the institution.

### 7.4.5 Outcome space for research question 1c.

It should be noted that the interplay experiences (2B) and the context connected experiences (2D) were the least numerous coded descriptions, which perhaps goes some way to indicate that the majority of participants predominantly experienced the framework either at the lowest complexity, as single forms of knowledge (2A) or as the second highest complexity, integrated (3C) whereby all three forms of knowledge were considered together.

The hierarchy which emerges from these categories of description do so through moving from a low level of complexity through to a high level of complexity in terms the use of TPACK and its component elements. (Figure 19)

**Figure 19 – RQ1c Outcome space**



At the lowest level of complexity, the participants experience TPACK through single core knowledge domains, isolated from other domains and with limited consideration for the relational aspects of the knowledge domains with each other. Whilst Mishra & Koehler take the view that “viewing any of these components in isolation from the others represents a real disservice to good teaching” (2006, p. 1030) it is clear from the participants that they often do

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experience their development activity in isolation and as such their experiences of TPACK are often presented in domain isolation. This means that participants experienced TPACK in a way that “pigeon-holes” or categorises their development experiences as being either content knowledge (CK), pedagogical knowledge (PK) or technological knowledge (TK). This was a common occurrence across all participants, and even those who also experienced more complex hierarchy did often refer to development within singular forms of knowledge. This may be symptomatic of the fact that “majority of colleges and universities have bifurcated professional development programs that address these types of knowledge separately” (Stover & Veres, 2013, p. 93) and as such the institutional cultural separation of these areas for development are still too deep for many participants to see beyond.

Participants who experienced TPACK at an increased level of complexity in the hierarchy presented this through experiences situated around the interplay of the domains and the relational influences that domains have on each other. It is this interplay that the original authors of both the original PCK (Schulman) and then the extended TPACK (Mishra & Koehler) emphasise in their publications and whilst this hierarchical level is not representative of the deeper interplay of all three domains it does represent an increased level of hierarchy through its combining of two single domains. Within the TPACK framework these domain interplays are represented through the overlap of the core knowledge domains and presented as technological pedagogical knowledge (TPK), technological content knowledge (TCK) and pedagogical content knowledge (PCK) where the forms of knowledge intersect with each other.

The next level of complexity of hierarchy in this outcomes space is the integration of all three forms of knowledge, whereby participant experiences of the framework in the context of their professional development are presented through all three domains of the framework holistically. Ten of the sixteen participants presented experiences of their development in this way, perhaps

influenced by the fact that they have all proactively made use of TPACK as a framework for their professional development beyond their workshop experience. Category of description 3D represents the most complex experience of using TPACK presented through this outcomes space. Six of the participants were coded to this category of description, the lowest number compared to the other categories of description and is the one through which the participants experience of TPACK extends to the wider contexts within which the use of the framework takes place and additionally consideration for how the framework's use might be extended in the future. This category reflects not only the participants direct experiences of using TPACK in the context of their own professional development but their continued use of and consideration for TPACK beyond the specific phenomenon which they participated.

### **7.5 TPACK as a framework for supporting holistic development.**

Research question two seeks to understand the extent to which the experiences presented through the outcome spaces evidence that the use of TPACK is effective as a framework for supporting academic staff development through which the approach is more integrated.

In outcome space 2 we see participants make specific reference to technological elements of their development and is most apparent in categories of description 2D and 2E where some participants are equally knowledgeable and reflective of their technological development needs as they are pedagogical and subject related.

Participant L makes specific reference to their observation that when reflecting on the fact they “do have ways of imparting pedagogical knowledge” they do not feel that they have the technological skills to do this “in way that more young people can relate to it”, giving a strong sense of the intern-connected nature of the pedagogical and technological knowledge (TPK) required for effective teaching, and their associated development linked to this. This more holistic consideration for professional development was particularly strong in relation to student

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experience (description 2D) and curriculum enhancement (description 2E). TPACK as the ultimate knowledge domain naturally sits well in these areas where the content, pedagogy and technology converge and it is heartening to see this being evidenced through the outcome spaces as part of participants' discussions on their development experiences. Participant J makes very specific reference to TPACK domains in support of course design "there are very definite statements about the use of technology, pedagogy and content", a strong indication that using TPACK has additionally influenced a more holistic approach to course design as well as the development activities in support of it.

The evidence to suggest that TPACK supports a more holistic approach is more strongly evidenced in the third outcome space, more specifically descriptions 3B and 3C where we see the emergence of descriptions which directly correlate to the integration and intersections of domains through staff experiences. Again, Participant J seems particularly attuned to this where they reflect on the way in which TPACK helps shapes conversations about development needs "the TPK bit here is saying, well, I needed a bit more time and.....been a really useful vehicle for a conversation with managers". Participant P makes reference to the way in which "it becomes clear to me that there are so many things I cannot do in that area [pedagogical] because I don't have the technological know-how", acknowledging skills gaps and identifying linked development to close them. Participant Q offers up a clearly aligned statement in support of the view that TPACK is an effective framework for development and that they "like this [TPACK Framework] because it's integrated and it's holistic".

Description 3C directly relates to the integration of knowledge domains and the experiences portrayed through it are almost entirely centred around the way in which TPACK works holistically as a framework so it is therefore not surprising to see string evidence of how this also improves development experiences. A number of participants propose that TPACK forms the

basis for PDR discussions, whilst others such as Participant B begin to reflect on what development was like prior to TPACK “if we do them separately that's why we end up with those two extremes that I talked about before; either the technology drives a restricted approach or it gets, tries to get retrofitted in a way where it feels unsatisfactory”. This experience of TPACK demonstrates that through its own design the framework encourages staff to think more deeply about the interplay and integration of the knowledge domains and is best summarised by Participant L who states “if you're using this framework as a development model, it's difficult to get away from the fact that you're thinking about the three areas together rather than thinking about them separately”. Therefore, in the context of this study and the experiences presented through the outcome spaces there is strong evidence to indicate that using TPACK not only encourages academic staff to think more holistically about their development planning but also significantly improves their overall experience of academic staff development when the Centre for Learning and Teaching has used TPACK framework as the overarching strategic approach to a more integrated academic staff development model.

## **7.6 Chapter summary.**

This chapter presented the findings of the data analysis as represented across fourteen categories of description, hierarchically presented through three outcome spaces (aligned to each sub question of research question 1). The first outcome space is structured around five categories of description which represent the variation of experiences of academic staff in relation to their professional development. The categories were represented through varying complexity from informal to formal: conversation (1A), resources (1B), support (1C), internal activity (1D) and external activity (1E). All participants experienced development in more than one category but not all participants experienced development across all categories.

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The second outcome space also presented participant conceptions across five categories with a hierarchy moving from low reach to high reach, representing the extent to which the development experiences impacted others. These were represented as development for requirement (2A), for upskilling (2B), career enhancement (2C), student experience (2D) and curriculum enhancement (2E). The hierarchy was predicated around the extent to which the development would have impact on others and the reach beyond its initial sphere of influence. Development as a requirement was lowest in terms of it being individually focussed, with limited scope for the impact of that developing reaching beyond the individual through to curriculum enhancement being most complex and having the most impact on others and thus the furthest reach and most complexity.

The third outcome space represented the ways in which staff experienced TPACK more broadly as a framework for professional development. At the least complex this was experiencing TPACK through single knowledge forms (3A), next was experiencing TPACK at the intersections of knowledge forms (3B) through to a more complexed representation where TPACK was experienced in its holistic form across all three knowledge forms. Finally, the most complex category of description in this outcome space was represented through context connected knowledge forms (3D) where participants experienced TPACK with the additional complexity of contextual consideration and integration. This chapter has presented these findings through the outcome space as an output of the analysis process and validated as representing the variation of experiences presented by participants. This chapter also draws upon these outcome spaces to discuss the extent to which using TPACK as a framework supports a more holistic approach to academic development. The next chapter will further discuss these experiences and the variations of them in the context of any wider literature, drawing upon other research to compare and contrast the findings of this study.

## **Chapter 8: Discussion**

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### **8.1 Introduction.**

This chapter examines the extent to which this study compares to other studies in the areas of academic staff development and, where available, use of the TPACK framework within that context. This comparative process will discuss each of the research questions, draw upon the findings of this study and examine the similarities and differences between this and other studies in relation to the categories of description which have been presented. I will draw directly from some participant quotes already provided in the findings chapter, as well as additional quotes to provide context for the comparison and to help understand the extent to which the descriptions presented in this thesis compare or contrast to the findings of other studies. Marris (2011) defines staff development as “the process whereby employees of an organisation enhance their knowledge and skills in directions that are advantageous to their role in the organisation” (p.1). This overarching definition certainly talks to all of the three outcome spaces, the first in relation to the way through which staff have experienced this development (informal to formal) and mapped it to the TPACK framework, the second relating to the purpose of that development (and the reach that development has) and thirdly in what context that development is determined (and the complexity of that interaction with the TPACK framework).

### **8.2 Discussion of the distinct qualitative factors derived from the nuanced experiences of academic staff in their professional development through the application of TPACK.**

In this study, staff articulated the different types of development they had experienced and what emerged from that was categories of description which represented the variation of these experiences through those different activities. These were presented through the outcome space hierarchically in terms of the nature of the interaction (from informal to formal). In this subsection I will examine each of those categories of description with a comparison of each against existing literature relating to current research into academic staff development.

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The first of these categories of description is development through conversation. Whilst the research specifically related to conversation as an academic development activity is limited (K. Thomson, 2015) there are some recent studies which have begun to examine the role of conversations in academic development. A study by Garraway et al. (2021) proposes that a Change Laboratory methodology may provide more opportunities to maximise the potential of these experiences and that “informal academic conversations constitute a valuable addition to the repertoire of academic development initiatives.” (p.1). These informal interactions are experienced by participants in differing ways and often less formally than suggested by the use of the Change Laboratory methodology above. Thomson (2015) more specifically refers to these as ‘corridor conversations’ and this is a concept specifically support by participants in this study.

*“Well sometimes it's just been literally I think a corridor a conversation. You know when you talk to somebody and they're doing something you think that's actually really interesting or get involved in things and then realize they need to do something.” – Participant R*

Thomson’s research also alludes to those experiences where conversations occur after formal development sessions and again this was a lived experience of participants in this study.

*“you end up with somebody from engineering who we have very different approaches and so it's about, it's always about questioning each other. And that conversation that's what's really important I think.” - Participant G*

This suggests that these conversational experiences are integral to the development of academic staff and whilst recognised as an important informal development activity within my study there is still limited research into the specific understanding of these informal conversation, other than sometimes through its role in mentoring (Ferman, 2002), which is a formally constructed conversation. The quote previously presented above also hints that in the context of TPACK, the

conversation with colleagues from other discipline areas is often associated with conversational experiences situated particularly around pedagogical knowledge. Through these conversations academic staff share their pedagogic approaches and consider how they might be applied in differing disciplinary contexts. Interestingly, in relation to this study only two participants made specific reference to mentoring with regards to their own development experiences, and both strongly linked this to conversation and whilst the concept of mentoring might be considered more of a formal activity, the reality is that whilst they are often formally initiated the nature of those relationships and conversations are very much informal (V. Singh et al., 2002) and similar in nature to corridor conversations.

*“so a lot of our conversations were around identifying maybe baby steps that they felt my [subject] knowledge, could help to oversee influence and mentor them in some ways, and likewise a lot of the stuff that I was saying in conversation with them was where they could help oversee influence and mentor my content to my pedagogical development areas.” – Participant D*

Through this example it is apparent that Participant D experiences the conversations in mentoring as very much a two-way experience, informing both pedagogical and content knowledge. Whilst in the quote below Participant H refers to conversations that specifically exclude some pedagogical discussions and largely focus on content knowledge and issues relating to student experience.

*“We never have conversations about how we teach. We have things about research and the student experience.” – Participant H*

Therefore, this study supports the concept of conversation as a mechanism for development and that this form of development is very often informal in nature, even where it may have been initiated by a formal activity such as mentoring. The nature and content of these conversations

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vary depending on the participants, but predominantly centre around the development of pedagogical and content knowledge. The conversational experiences in relation to academic professional development identified in this study align with other emerging research in this area. Participants in this study also made reference to the range of resources they used as part of their development (often self-identified and self-initiated). The examples observed in this study and presented through the findings included reading academic papers, watching you tube videos, accessing blogs and websites and using a range of locally developed resources and information, often provided by an institutional support service. In one study the use of these resources also extended to a broader individual approach of using self-reflection as an extension to resources to further support individual professional development (Ferman, 2002) but yet in this study regular self-reflection did not strongly feature as a development approach through the use of TPACK, so it may be that it is just not a particularly prevalent model within the institution where this study took place or that participants did not surface this particular aspect through the interview process. However, it was implicitly present when participants discussed other formal development activities within the institution, such as the process of gaining fellowship of the Advance HE, although not directly referred to as 'reflection'.

*“the HEA, senior fellowship was really important. It was about highlighting those things that I do, but also in addition to that it was highlighted quite clearly the things that I haven't done.” - Participant G*

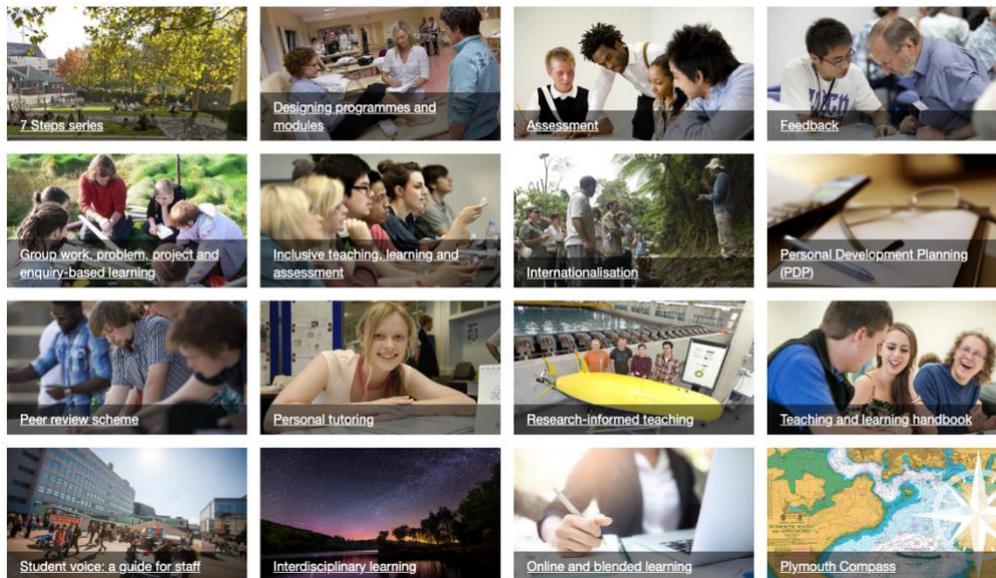
The dominant feature of resources in support of academic development is that they are accessible anytime and anywhere so that an academic staff member can access these as required and as such the majority of resources are easily available through either local networks or via the world-wide web. Even twenty years ago researchers recognised the need for academic staff to have access to their development resources in this way with a view that “it appears unthinkable

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for an academic staff development unit not to have a presence on the web.” (Kandlbinder, 2000, p. 375) and a quick Google search using the term ‘guides and resources to support academic staff development’ results in numerous links to higher education institutions web pages dedicated to supporting academic staff across a variety of pedagogical and technological knowledge areas.

**Figure 20 - University of Plymouth Teaching and learning guidance and resources.**

**Guidance and resources**



Note. Screenshot take from: (University of Plymouth, n.d.) *Teaching and learning guidance and resources*. Retrieved May 2, 2022, from <https://www.plymouth.ac.uk/about-us/teaching-and-learning/guidance-and-resources>

Increasingly, these resources are public facing (not requiring institutional sign-in) and is perhaps an indication of the collaborative nature of educational development that was a feature of early digital skills development (Creanor & Littlejohn, 2000) and so whilst there is no specific research that was identified, with regards to the use of resources to support academic staff development, it is clear from the numerous dedicated online spaces that these resources exist and are accessed by academic staff as part of a range of approaches to their development (Ferman, 2002) and that these resources may also form part of a more formal staff development process such as a

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PGCERT (Bath & Bourke, 2011) which are subsequently made available more widely, including through an online provision (Potgieter & Louw, 2021) and often through a public facing website.

*“I use things like the the WonkHE blog and other summaries like the Advanced HE one” –*

*Participant B*

*“I find sometimes it's just as easy for me to learn or something off YouTube.” – Participant*

*G*

In the context of resource access, a study in Australia examining public facing academic staff development pages, identified that 53% of weblinks were associated with self-directed learning resources which “indicates an increasing responsiveness towards authentic delivery of staff development via online resources” (O’Reilly et al., 2000) and additionally “Such self-directed packages provide busy staff with a great deal of flexibility in regard to time, pace and place of learning.” (p. 228). It can therefore be determined that resources and access to them form a significant part of the professional development experience of academic staff and that this is very much supported by the experiences of staff which emerged through my research, as represented through the category of description.

What else emerges from this study is the way in which ‘development through support’ is presented as being an active action on the part of the academic staff member, reaching out to an identified person/group to provide the necessary support and guidance.

*“I think as my career progressed I think the more formal aspects that the HEA (Higher Education Academy) stuff I suppose is the most obvious example to point to support by all of CLT (Centre for Learning and Teaching)” - Participant C*

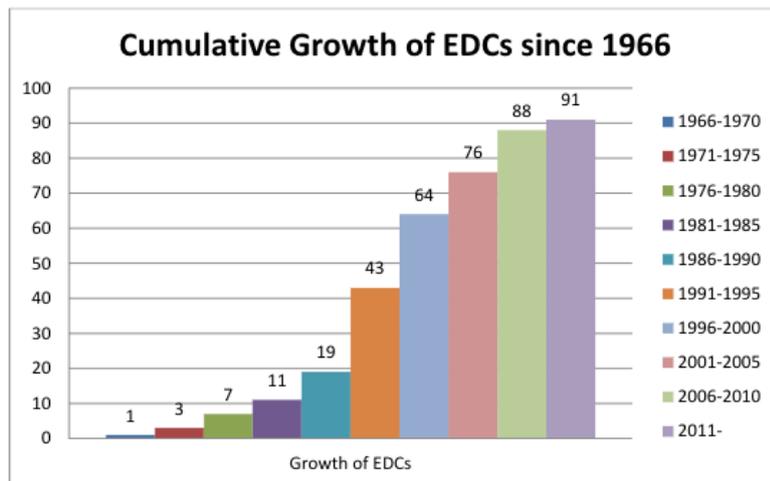
*“we used to invite one of the people from CLT to come to you come once or twice” –*

*Participant O*

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In the context of this study the institution's Centre for Learning and Teaching has a role in both pedagogical development and digital education (technological) development. Educational development units (EDUs) such as this are now common-place across the sector and has seen steady growth since the late 1960's in the UK (Jones & Wisker, 2012).

**Figure 21 - Cumulative Growth of EDCs since 1966**



Note. From: Jones, J., & Wisker, G. (2012), p. 15. *Educational Development in the United Kingdom Report for the Heads of Educational Development Group (HEDG)*.

It is therefore unsurprising that participants' experiences in this study often refer to support from CLT staff members by name (the names have been redacted from the quotes for ethical reasons but are identified by CLT#). These interactions between academic staff and colleagues in educational development units form a significant part of the process of seeking and experiencing developing through support.

*"so both actually, it [support request] was both initially through [CLT 1] and [CLT 2]" -*

*Participant A*

*"[CLT 2] came in more than once for rubrics, how we can embed rubrics and what the benefit of them was" - Participant I*

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It was not only the educational development team who were identified as places to reach out for support, particularly with regards to where support for using digital tools was required. Wider digital education teams (such as those based in IT service departments) were also identified when seeking support.

*“one thing I'm very good at is asking for help when I don't understand things so I'm not constantly on the phone to learning systems, but I'm on the phone a lot, and I find them extremely supportive and helpful and knowledgeable” – Participant Q*

*“And I'm always saying to colleagues. Can't believe, you know, you never phone learning systems.” – Participant I*

These experiences of participants echo the research into the role that these departments/units have in supporting the development of academic staff in the areas of educational technology, support scholarship of and research into learning and teaching, improving learning and teaching methods, supporting curriculum development and leading on formal qualifications for learning and teaching recognition (Gosling, 2001). Whilst not prevalent across all participants, those who did identify this as an experience found working closely with a member of a support team (educational or technological) rewarding and often repeated the process.

*“I mean, I think I think um, probably where it (pedagogical support) where I apply it the most is actually in the development of courses, and at course level it's probably where it has the greatest impact” – Participant M*

This aligns with Ferman's study (2002) where she also observes that the process of working with educational designers/developers for dedicated support is a highly valued development experience.

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“Of the 16 participants in this investigation, 11 explicitly referred to the value of working with an educational designer” (Ferman, 2002, p. 150). It is clear then, from both her study and through this study, that by seeking support in this way from academic developers, participants are looking for specific expertise and that these interactions are subsequently contributing to the development of those individual academic staff who seek it out. Academic developers do not only provide skills and information but also act as mentors and provide guidance to academic staff (Smyth, 2003) and so the support they ultimately provide will present itself in many ways. As observed ‘support’ is often sought from internal expertise provided by other institutional services and departments of the institution on a ‘point of need’ basis. However, this differs from internal activities which are planned and provided by internal services on a more structured basis. Brown (1992) refers to this internal activity as organisational development (OD) with the view that “we can summarise successful OD as a programme of planned improvement aimed at developing the organisation’s internal resources for effective change in the future”. (1992, p. 179) In the context of this study participants often make reference to “DEAP” (Developing Excellent Academic Practice) as this is understood to be an umbrella term for a number of academic development activities provided by the institution where this study takes place, culminating in an annual “DEAP” conference.

*“through going to DEAP fora or DEAP conferences or other sorts of activities” – Participant B*

*“it might be things such as workshops that have been delivered by IT services, it could be the DEAP conferences and the DEAP digital stuff” – Participant D*

This supports the conception that internal development opportunities are very much part of the development experience of staff, in this case strongly associated with their digital development (aligned to technological knowledge) and aligns to the findings of other studies into TPACK

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which show that institutions often make use of internal “centralised” teams to support academic staff in their digital development (Dysart & Weckerle, 2015). In some cases these internal development opportunities are the only mechanism that some staff have to access development for some areas of TPACK.

*“I think if I'm really honest it's, you know, I feel like the only time I ever really get to develop any sort of pedagogy is through DEAP” – Participant G*

This example highlights the importance of such internal development opportunities for staff who may not be accessing many other types of development. This might be particularly relevant to an institution where the academic development unit is very much focussed on supporting local change, aligned to a local priorities and so therefore are “actively involved in meeting institutional and departmental development needs, focusing particularly on topics that are deemed of practical and immediate use by their colleagues.” (Quinn, 2012, p. 160) and more specifically these development units were very much tasked with supporting the implementation of an education or learning and teaching strategy (Gosling, 2001) which would account for their considerable contribution to internal development activity. “Educational development is recognized as having a significant impact on achieving organizational change to meet the challenges of a rapidly changing HE environment, especially in evaluating and developing the use of IT in learning and teaching.” (2001, p. 88). This aligns with some participants’ experiences of internal development within my study which suggests that in some instances it is considered a requirement to undertake this activity in support of institutional change.

*“it's everybody's obligation to actually engage in continuous pedagogic development staff development.” – Participant F*

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A number of participants made reference to the “HEA Fellowship” (Higher Education Academy Fellowship) and an indication that it is a requirement for all academic staff to have a recognised qualification or fellowship in learning and teaching (driven by an institutional strategy).

*“there's been a move for people to become fellows of the Higher Education Academy which I think is positive and most people who start as new teachers have to do, I think they now call it a postgrad certificate academic practice.” – Participant O*

All of these activities are internal to the institution and that educational development units play a critical role in supporting these activities and experiences, so unsurprisingly the participants in this study also clearly identified this as an experience they have had in relation to their own academic development. It is therefore possible to conclude that internal educational/academic development activities are integral to the overall professional development experience of academic staff and are more commonly aligned to supporting institutional policy or strategy (Gosling, 2001). Whilst internal development opportunities were commonly referred to across a number of participant interviews, the use of or access to external development opportunities were less prominent in my study. This is very possibly connected to the fact that organisational development in the context of the institution is often aligned to “planned improvement aimed at developing the organisation’s internal resources for effective change in the future.” (Brown, 1992, p. 179) and therefore discussions and planning around development are often internally focussed and as such internally supported. However, the limited reference to external activity might be attributed to a lack of time as participants experiences suggest that the internal DEAP events require less time commitment than external activities and so are more commonly experienced.

*Mostly down to just having the that the time set aside, it's as I say you're going back to when we do things like the DEAP..... you'd like to have the opportunity to probe more*

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*or you'd like to have the opportunity to actually work across the field and yet you just don't get the chance to do that. – Participant H*

*Just because we haven't got the time. I mean, I'll go on to a DEAP conference and then I'll hear from somebody else what they're doing.....but in terms of immersing myself in the pedagogy, there's just no way. – Participant I*

A lack of time is something which has been regularly identified in the UK as a barrier to accessing development (Walker et al., 2018) and this is more apparent where the development activity is external and/or requires funding for it (Holmes, 2020) and these are exacerbated by long-standing barriers relating to a lack of institutional resource or lack of local departmental culture in supporting external development (Zinn & Caffarella, 1999). Where examples of external development activities exist these largely present themselves around two areas. The first of these inviting external experts into the institution to support development:

*“We got an external expert in to give us a series of workshops and then we shared practice internally and that was a really good approach.” – Participant A*

*“prompted me to go to [Head of School] and suggests should we have a school sort of pedagogic development maybe. I thought it could be a good external speaker and [external speaker name] could possibly do this with all of us actually. – Participant F*

Secondly, access to an external event (usually a subject related conference) of which the participant is an attendee.

*“so, I've just been at a conference this last week which is around digital art. So, it's not strictly, it's sort of related to what I do but I'm teaching on graphics, teaching on illustration” – Participant C*

*“A couple of the projects were gamification projects so we ended up going to the European conference of games based learning” – Participant F*

In these examples the participants are exploring new areas of teaching and as such required development to support this process, in particular around teaching of the subject and this is supported by another example whereby the participant is learning new software to support the teaching of that subject.

*“there's been certain aspects which have been specific to my role so using again software that is specific to what I would then demonstrate out to staff and students and I've attended sessions from external companies that way” – Participant D*

Role based development was also often supported through external activity;

*“So in September I hope to go to Denmark on an Erasmus visit .....because I'm the Erasmus tutor. So I've made myself do that which is staff development so it's not a formal course but I hope to learn a lot in Denmark about the Danish education system. So I've identified I'd like to do it, signed up for it, filled the forms and got the funding and fantastic.” – Participant Q*

However, some types of external development appeared to have less chance of funding, although it is not clear whether these are institutional policy decisions or local departmental decisions. Even though it is likely that a number of academic staff undertake external examiner roles only one participant made reference to this as a form of development, despite some studies suggesting that external examining itself is “perceived as part of professional or career development, maintaining awareness of practice and issues,” (Hannan & Silver, 2006, p. 63), however, this is not something that can be corroborated within my study. What does emerge through the participants experiences is that external activities are a distinct variation of

experience with regards to their development compared to other categories of description. What does emerge from these experiences is that staff generally appear to have a preference for more internal and informal development opportunities, rather than formal external development, something which is additionally supported by a UK study funded by the Higher Education Academy which found that “there was greater appetite for learning by doing, peer-to-peer support, observing others, and self-reflection - which lead to actual improvement in teaching and learning - than for attending formal training courses.” (Locke et al., 2016, p. 6). Perhaps one reason that it is not as prevalent as internal development is related to cost, as summarised by this participant quote.

*“The cost of leadership development is much more expensive than the cost of research development. So, you can spontaneously go to an internal workshop here on some weird newest qualitative thing and you've done it in half a day and it's usually free. Whereas if you do an executive development program with Higher Education Academy we could not have afforded to go unless we got two the price of one, so, resources particularly currently are a very very tight and internal development is often the only way you can go so this resource impacts on your decision making around development.” – Participant A*

This quote is indicative of other participant experiences and whilst some may have undertaken external development, they are clearly less likely to so, with time and money being the main barriers to them. This aligns with other studies of academic staff experiences, which also identify both time and lack of resource as being significant impeding factors to being able to access or engage with professional development of this nature (Caffarella & Zinn, 1999; Ryan & Bhattacharyya, 2016).

In discussing the findings, in relation to research question one, many of the conceptions presented through the participants experiences of using TPACK for academic development are

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present in other studies relating to more general experiences of academic staff development. It is therefore possible to conclude that these experiences are not experienced because of the use of TPACK but that the TPACK framework acts as a point of reference to identify these activities and holistically consider them in the context of a broad range of academic development experiences and this is very much supported by studies whereby “the literature clearly demonstrates the benefits of institutional commitment to a formal framework underpinning professional development” (Holmes, 2020, p. 84). Of particular note, is that a couple of participants did make reference to leadership development which is not immediately referenced within the TPACK framework but which they drew upon in discussing their experiences and so it might be suggested that whilst TPACK is indeed a framework through which staff do experience and reflect on their academic staff development it is not unique in this despite giving some structure to do so. As previously discussed in the methodology chapter, a component of the outcome space is to understand the hierarchical relationship between the categories of description. This has been presented as a continuum between informal and formal development and aligns strongly with previous studies on the types of academic development that has been identified (Brown, 1992; Dysart & Weckerle, 2015; Spilker et al., 2020; Zinn & Caffarella, 1999). The complexity of experience presented through the outcome space is a unique finding of this study when compared to other studies as although previous studies, such as that by Ferman (2002), provide examples of both formal and informal development, as summarised below (Table 7), they do not present these in any hierarchical manner or a way in which presents the relational complexity of those experiences.

**Table 4 - Formal and Informal Development**

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<b>Formal</b>	<b>Informal</b>
Research Publications	Conversations with colleagues

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Workshop Attendance	Reading
Formal Training	Receiving feedback from colleagues/students
Conference Attendance	Being mentored
Accessing Resources	Networking

Note. Adapted From: Ferman, T. (2002). Academic professional development practice: What lecturers find valuable. *International Journal for Academic Development*, 7(2), 146–158.

<https://doi.org/10.1080/1360144032000071305>

Additionally, Ferman does not give a clear rationale for these categorisations and as such the categories are in some cases subjective. What the hierarchy of categories does within the outcome space is place the participants experiences of development on a continuum of formality in the context of those experiences as presented through their lived experience.

Additionally, the three core domains of the TPACK framework can be represented within the outcome space to indicate which of these three domains were represented through the conceptions which is summarised in the table below:

**Table 5 - Summary of RQ1a Outcome Space with TPACK mapping.**

Category of experiencing development	Overview of category	TPACK relational element
1E Development through External Activity	Experiencing development as an activity external to the institution	This development is often highly structured and strongly associated with Content Knowledge element (although some participants also refereed to pedagogic development also). Strongly linked to discipline specific conferences.
1D Development through Internal Activity	Experiencing development as an activity internal to the institution	Largely associated with Pedagogic Knowledge development (e.g. PGCAP and Advance HE fellowship activity) but also some specific activities for Technological Knowledge (digital tools for L&T). These were also structured experiences often organised by a central internal service/department.

1C Development through support	Experiencing development through accessing support.	Participants referred to their development in relation to when they actively sought out support (usually from a central service) in relation to an activity. A high proportion of these were related to technical support (Technological Knowledge) and in some cases curriculum design activities (mainly pedagogical knowledge). These were almost always unstructured and at point of need.
1B Development through resources.	Experiencing development through accessing resources and information.	Participants referred to their development in relation to identifying and accessing learning resources and information (from an institutional service or from the wider internet). This includes short guides, (YouTube) videos and published scholarly research. These resources were used to support Pedagogical Knowledge and Technological Knowledge domains.
1A Development through conversation	Experiencing development as a conversational activity.	A few participants referred to development experiences in relation to casual conversations or peer to peer meetings with colleagues within and outside of their departments. These were unstructured and largely associated with problem solving and sharing practice. Within a department these were often linked to Pedagogical Knowledge and Content Knowledge (PCK) whilst conversations with colleagues outside of the department often related to Pedagogical Knowledge (PK) and Technological Knowledge (TK) (TPK).

### **8.3 Discussion of the distinct qualitative factors derived from the nuanced experiences of academic staff in their professional development planning through the application of TPACK.**

Participants in this study experienced their development planning in relation to TPACK through five identified categories of description. These are not to be confused with motivations (intrinsic or extrinsic) for undertaking development, which are well documented elsewhere (Montero-Hernandez et al., 2014; Quinn, 2012; Zinn & Caffarella, 1999) and was not specifically part of this study, but much more about the purpose and objective for undertaking development and

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understanding the variation of those experiences in the context of TPACK. In this section I will discuss each of the categories of description in comparison to the existing literature in these areas and draw upon participant quotes to highlight aspects of the discussion.

Participants made reference to “some things which you are obliged to do” (Participant C) and “things which are statutory requirements” (Participant Q). These predominantly fell into two main areas, the first being activities which did not directly relate to their academic roles and were a requirement for all staff in the organisation (health and safety, data protection etc) and those which were related to their role as an academic (HEA fellowship, teaching qualification (e.g. PGCAP), researcher supervision training etc). There is limited literature that I was able to discover that specifically examines in detail the academic experiences of this formally ‘required’ development, although it does sometimes appear in broader studies relating to academic development and the motivation for undertaking such development from which it is possible to draw comparisons. In relation to academics’ development as ‘teachers’ Leibowitz (2014) observes that “in the UK such a qualification is required for many new lecturers” (2014, p. 357) amid the shift to improve learning and teaching and that this forms a significant part of the work of educational development units across the UK (Jones & Wisker, 2012). In the institution where my study takes place it is a requirement to have a teaching qualification or (HEA) fellowship completed within a two-year probation period, if this has not already been obtained prior to appointment and in some cases the basis for required development was specific to undertaking a new role or responsibility. Although the wish to seek out a new role may be voluntary, the development in support of that is often perceived as a requirement (in this case based on institutional policy).

*"I've just been approved to supervise a research degree so I need to do some training for that. You know I mean it's a requirement but that's something for me to do specifically to the role really. So I mean, it's a requirement of me being approved" – Participant C*

Development for requirement sits at the lowest point in the hierarchy of the outcomes space, reflecting its focus on it being development for others (required by them) and not perceived as being for self. These types of development are often directed by policy, law or a need for compliance. Rowley (1996) refers to these as "hygienes" which she says are "extrinsic factors, which the organization largely determines" (p. 13). Leibowitz's paper positions that "the focus and purpose of academic development is influenced, if not determined, by the policy and cultural environment in which it functions." (2014, p. 358). The participants' conceptions represented through the "development for requirement" outcome space strongly aligned with the other studies in so far as the experience of development as a requirement is consistent within an environment which is culturally steered by policy, but the extent to which there is much value and impact of 'compulsory' training has historically been questioned in so much as "Individuals are important, of course; but policies based on methodological individualism do not lead to institutional change." (Trowler & Bamber, 2005, p. 6).

Although it might be suggested that "upskilling" could be more generally applied across other categories (after all much development is about skills) some participants' experiences of planning their professional development was experienced specifically through identifying development which was necessary to complete in order to develop 'skills' to complete specific tasks or fulfil roles (but not necessarily formally required of them). Quinn (2012) refers to this as "skills discourse" where her study identified that "many lecturers used the word 'training', and talked about needing professional development in order to gain the 'skills' of a 'good' teacher." (2012, p. 78) and that this type of development is largely divorced from educational theory and

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focussed on the 'practice' of teaching rather than the understanding of it. In many cases participants related "skills" development to attributes specifically related to the teaching of their subject and transferring these skills directly to the students via their teaching.

*"I teach robotics and we've had a robot for a year, about a year now, no two years. I did a training course, a week's training course at the company. And now I've got to the point where I want to advance my skills and so they're coming up and doing a two day on campus at our place training course." – Participant R*

*"it's very much towards the technical technology side of things, and I was having to build up some programming skills and how to use virtuality reality and things like that." – Participant C*

One participant made specific reference to the development of leadership skills, identifying the need to develop these in the context of a leadership role.

*"I did a mountain leadership course through the university and my rationale for doing that was around my leadership skills and how to lead others or how to instruct others" – Participant D*

As supported by Quinn's study, this 'skills' based development is often referred to as 'training', something that is further supported by other studies and additional literature relating to staff development (Brown, 1992; Holmes, 2020; Quinn, 2012) in so far as it is often not referred to as development and aligns to what Quinn refers to as being "anti-intellectual discourse" development (2012, p. 78). As previously noted, this 'upskilling' is often task orientated and driven by an individual's need to fulfil a specific objective and is approached differently to the planning of other development experiences.

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*“In terms of my overall development needs, I suppose it's kind of self-selective. So I think about things that I need to achieve and the skills I need to get there.” – Participant L*

This self-selection is what differentiates the category of description 2B from the previous one in so much as whilst the development might be needed to fulfil a role, it is at the request of the individual academic being developed, not based on the necessity of the organisation. In their literature review, (Zacher et al., 2019) observe that “interventions which specifically focus upon learning new skills may likewise bolster outcome expectancies” (2019, p. 363) and that they are just one ‘mechanism’ by which staff develop “career-related self-efficacy”.

All participants in this study have between eight and twenty eight years experience within the institution where the study takes place and so in terms of their career stage they would be considered mid to late-career academics, of which there is still a lack of specific research (Leslie, 2014; Zacher et al., 2019). Much of the research around academic career development is predominantly concerned with early career academics (Hemmings et al., 2013) and so the discussion of this experience additionally incorporates early career staff development research from which to draw a comparison. Zacher proposes that “*Academic career development* entails the career development process of scholars working in research, teaching, and/or administrative roles within academic and higher education” (2019, p. 358). This literature review reveals that teacher or researcher ‘training’ features strongly in most of the studies, and is very strongly influenced by the needs of early career academics. As indicated, within my study the minimum number of years a participant had been at the institution was eight and so although there was very little direct correlation with the experiences with the wider research on early career academics, some participants did refer to some of their early career development when describing their experiences of using TPACK, including their participation on programmes such as

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the postgraduate certificate in academic practice (PGCAP), which is an established early career programme at the institution.

*“initially through [staff name redacted] and [staff name redacted] and a bit of help through the PGCAP and then actually subsequently going to a couple of hours in the morning and we did it formally.” – Participant A*

What is presented through the wider literature is the way in which institutions “now take a strategic approach to personnel and career development” (Zacher et al., 2019, p. 358) in the context of career stages. This was also evident through participant interviews, where they directly relate their professional development to their career ambitions and current career stage.

*Well, I suppose what I usually do is I kind of think about, well, first of all, some of my development is, as I mentioned, career orientated. – Participant L*

*And also I think it's been driven much more now by me and if that's just a matter of where you get to in your career and you get a bit older and you think I don't have to do things because other people want me to do them... – Participant P*

It is possible to see how structures and processes influence the way in which participants identify development activities and what motivates them to do certain development activities.

*“I suppose to some extent it's to do with the way in which the career path is structured” – Participant L*

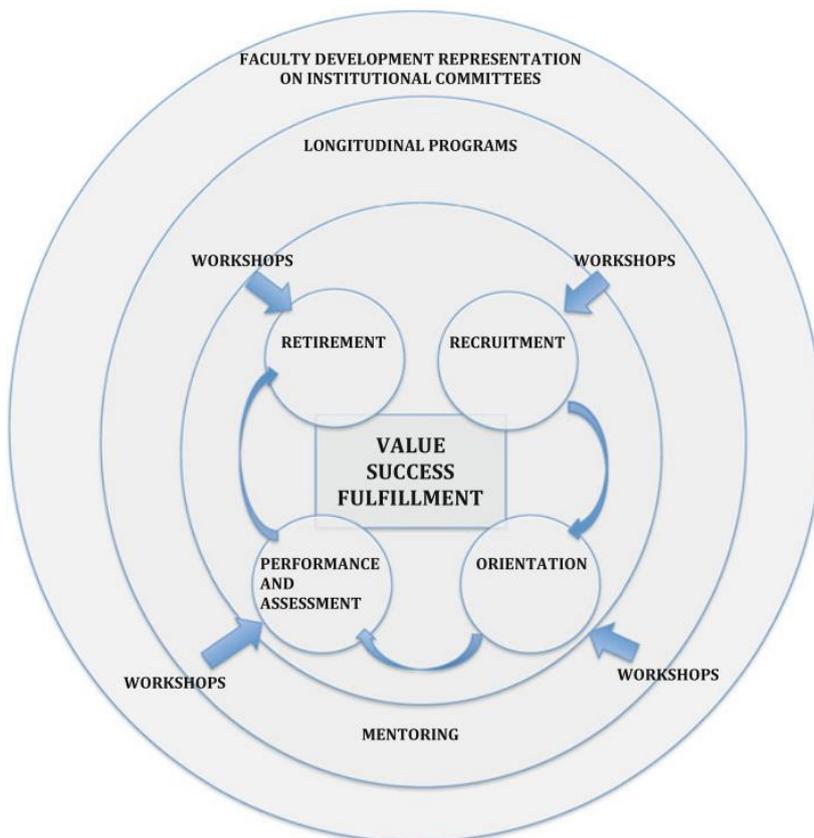
*“So, for example, if I wanted to advance to a professor, It's quite clear that there's certain things you might need.” – Participant M*

This process is very much orientated around themselves, and as such the ‘reach’ is limited as defined in the hierarchy of the outcomes space and recognises that “individual academics are faced with many choices, challenges and opportunities.” (Hemmings et al., 2013, p. 36) with a

broad range of activities in support of academic development and that “various methods should be considered to meet the needs of faculty members and the contexts in which they work.”

(Leslie, 2014, p. 98). Leslie goes on to propose that career progression is therefore intrinsically linked to “academic career trajectory” and that within this the development activities are identified by academics at the point at which they need it as part of their “career development cycle” (Figure 22). This development is focused around an individual’s career, one which “most often takes a self-directed route” (Caffarella & Zinn, 1999, p. 242) and so whilst the initial reach of the development is often limited to the individual it may subsequently have an impact on others at a later date.

**Figure 22 - Career Development Cycle**



Note. From Leslie, karen. (2014). Faculty Development for Academic and Career Development. In *Faculty Development in the Health Professions: A Focus on Research and Practice* (pp. 97–118).

[https://doi.org/10.1007/978-94-007-7612-8\\_15](https://doi.org/10.1007/978-94-007-7612-8_15)

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This is perhaps best summarised by a participant who notes development activities are structured around their self-reflection and evaluation of career progression and supportive of their direction of travel.

*“I suppose the other thing as well is that for career progression, this is another stream, if you like, that that contributes to developing, both developing self and you've got to evaluate where you want to go, what you need to fulfil to get there” – Participant M*

It is evidenced through this and other studies that development opportunities are integral to the career development of academic staff (Caffarella & Zinn, 1999; Leslie, 2014) and within this study participants' experiences of development planning included significant consideration of their career enhancement. Marris (2011) proposes that “engagement in staff/self-development should be seen as an excellent investment for moving towards career goals.” (2011, p. 4) and it is clear that participants in my study presented experiences that demonstrate this was a specific area for which they identify and plan their development using TPACK.

Student experience and curriculum enhancement related activities both also emerged as distinct experiences, more broadly referred to as ‘educational development’ within the area of learning and teaching (Jones & Wisker, 2012). This encompasses development of both the curriculum and learning and teaching activities in pursuit of enhancing the student experience, whereby educational development units “are purposefully playing a more central and strategic role within their institutions in leading change and development and supporting staff in providing a quality educational experience for students” (2012, p. 26). This includes the development of individuals’ for enhancing teaching practice as well as development of the curriculum as a collective activity, all ultimately in pursuit of improved experiences for students. The driver for these development activities are often directed through the institutional priorities with the rationale being that “one indicator of organisational performance can be the improvement of the students’ satisfaction

with a specific course or program” (Spilker et al., 2020, p. 493). It is this driver which places these categories towards the higher end of the outcomes space complexity as these development activities have the largest reach due to way in which the development of individual academics goes on to influence the course design, other academics on the programme, the students and ultimately the institution. In some cases, curriculum enhancements may result in improved student experiences and ultimately sector rankings and so the potential reach for these development activities is significant in comparison to the lower-level hierarchy of development for requirement. Participants in the study often made reference to their development and activities directly enhancing the student experience, whether that be at an individual level or at a collective level.

*“it (digital) is only ever a tool that you can use to enhance engagement. So it sits within a menu of other strategies and approaches that you might use. So yes it has been effective.*

*Yes. The students love, love it. Yes. The feedback is good.” – Participant A*

In the example above the participant shows how a development activity relating to digital (technological knowledge) has been used to improve student engagement with the validation for this approach coming directly from student feedback.

Other participants similarly reflect on their experiences, and in planning for their development connect their own skills development directly to the student learning experience.

*“I need to, if I'm going to improve in my use of technology, to improve my practice and therefore students learning. I really need to be more systematic about how I do that” –*

*Participant B*

And in line with the literature outlined above the driver for this is sometimes based on the institutional expectation.

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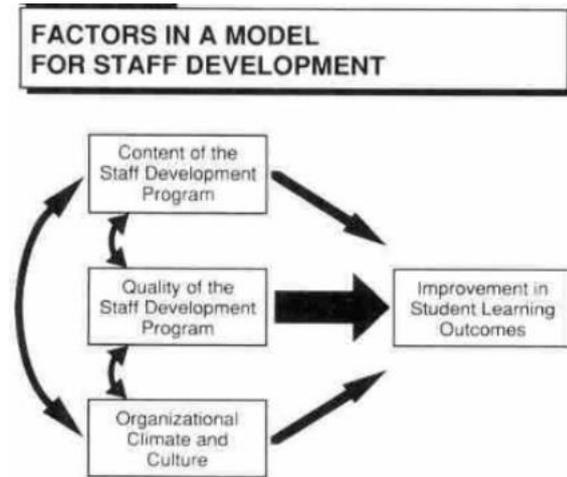
*“I think, in terms of the institution expectation..... we're all clear that that we need to be making much better use than we are, of technology to enhance students experience of learning” – Participant B*

When participants were asked about their experiences of planning their development using TPACK they often referred to student experience related requirements and there was a clear relationship between their own development and that of the students' experiences.

*“it's a mixture of my own professional development, feeling confident in what I'm doing in the classroom, wanting to explore new, being open to new ideas, but I also wanted to make sure that the students have as good an experience as we can possibly offer them”. – Participant I*

This aligns with other studies such as the one carried out by (Glowatz & O'Brien, 2017b) which shows that a key driver for technology use in learning and teaching was the for the desired outcomes to be 'enhanced student learning' and which 'enhances student engagement'. This close connection between the development of the individual academic and the experience of the student is perhaps to be expected in an environment where “the primary purpose of academic staff development is to expand the educators' awareness of the various tasks they must undertake to contribute to the effective education of their students” (Marriss, 2011, p. 1). This is further represented in the “Factors In A Model For Staff Development” (Figure 23) through which (Guskey & Sparks, 1991) present a summary of staff development research over a number of years, albeit recognising that “The link between staff development and student learning often is not a direct one” (1991, p. 73). In the majority of cases, participants who specifically referred to this higher-level development experience aligned enhancement of the student experience to either their classroom practice (pedagogical knowledge) or the use of digital tools (technological knowledge).

**Figure 23 - Factors in a model for staff development.**



Note. From Guskey, T. R., & Sparks, D. (1991). What to consider when evaluating staff development. *Educational Leadership: Journal of the Department of Supervision and Curriculum Development, N.E.A.*, 49(3), 73.

With regards to curriculum design, participants planned their development in a couple of key ways. Firstly, as mechanism for identifying the development needs of a course team in order to ensure that staff teaching the programme have the necessary skills and knowledge (content, pedagogical and technological) to be able to teach the programme.

*“I think at that point, when you're starting to look at the course provision at module level, that's where it starts sort of triggering a review of, you know, what development we actually need” – Participant M*

Secondly, individually identifying a need as part of a curriculum development process in relation to the specific module they are teaching on.

*“ I'm teaching a different module next year and one of the things I want specifically is a wiki based timeline” – Participant G*

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It is clear in these examples that identifying and planning development needs are triggered by curriculum enhancement activities. This is supported by the literature which has historically observed the emergence of “closer integration of staff development with curriculum change processes; follow up activity and support for implementing agreed changes;” (Brown, 1992, p. 187). Zinn & Caffarella note that development associated with “designing new courses.....are all examples of self-directed professional development” (1999, p. 242) although in the context of this study, some of this development was formally initiated through a quality assurance process within the institution and not entirely as a self-directed activity. Ferman (2002) examined what academic staff found valuable about academic development and this showed that “effective means of professional development include approaches that are centred round curriculum development” (2002, p. 150). This type of development was often supported through working with an educational developer or educational development unit (Jones & Wisker, 2012; Lueddeke, 1997). In fact Jones & Wisker’s report for the Heads of Educational Development Group (HEDG) shows that educational development units (at least those based in UK higher education institutions) have a significant role to play in both curriculum development activity and “are purposefully playing a more central and strategic role within their institutions in leading change and development and supporting staff in providing a quality educational experience for students” (Jones & Wisker, 2012, p. 26) all under the broad banner of improving learning and teaching and is additionally supported within this study where participants make frequent reference to the “Centre for Learning and Teaching” (CLT) and the staff members with it.

Again, it is possible to identify the TPACK relational element to the outcome space for research question 2 and show how TPACK is present within the categories of description as presented in the table below.

**Table 6 - Summary of RQ1b Outcome Space with TPACK mapping.**

<b>Category for identifying &amp; planning development</b>	<b>Overview of category</b>	<b>TPACK relational element</b>
2E Development for Curriculum Enhancement	Experiencing development for the purpose of enhancing curriculum.	Curriculum enhancement often referred to connecting the subject (ck) with the approaches to learning and teaching (pk)
2D Development for Student Experience	Experiencing development for the purpose of enhancing the student experience.	Student experience was mapped across all three core TPACK domains, demonstrating that technology use (tk) is a key consideration when it comes to the student experience, but strongly connected to pedagogy (pk) in support of learning the subject (ck).
2C Development for Career Enhancement	Experiencing development for the purpose of enhancing career.	Career enhancement was strongly centred around subject expertise (content knowledge). Some participants also made reference to career progression in relation to learning and teaching practice (pedagogical knowledge)
2B Development for Upskilling.	Experiencing development for the purpose of upskilling oneself to fulfil role/activity.	Staff experiences of upskilling focussed on developing approaches to learning and teaching (pk) and using technologies in support of that activity (tk). There was often a correlation between upskilling in the context of enhancing the student experience.
2A Development for Requirement.	Experiencing development for the purpose of fulfilling the requirements of a 3 <sup>rd</sup> party.	The majority of “required” development identified was in relation to health and safety or similar legal requirements. In the context of TPACK it was in connection to pedagogical knowledge where there was a requirement to undertake development (e.g. to have a teaching qualification or a fellowship of Advance HE).

#### **8.4 Discussion of the inherent qualitative factors which contribute to the diverse ways in which staff perceive and engage with TPACK as a framework for professional development.**

The way in which participants experience TPACK as a framework is presented through the third outcome space of which there are four categories of description. Unlike previous outcome spaces there is not enough discernible literature for a direct comparison of TPACK experiences within an Higher Education development context, and so I will draw upon wider contexts within which TPACK has been used from which to draw a comparison.

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In studies where use of TPACK has been explored with teachers and educators there is a view that use of the TPACK framework and awareness of it helps staff translate this into teaching and learning opportunities (Glowatz & O'Brien, 2017a; Ling Koh et al., 2014) although the contextual factors are rarely examined. In their school-based study Koh et al. showed that teachers regularly demonstrated experiences of TPACK at an intersection level of complexity (3B) across all sample groups with examples of all three of the knowledge form intersections (PCK, TCK and TPK), including eight percent of participants being observed as having evidenced TPACK within their conversations. As might have been expected the group within which the framework was the primary focus of the conversation observed the highest rate of reference to it (13.7% of coded paragraphs were TPACK related) suggesting that when the framework is consciously considered it is more likely to result in examples that sit across all knowledge areas together. This aligns with the evidence of my own study, where the integration of knowledge forms (3C) was specifically evidenced in the context of experiencing the framework. A longitudinal study examining levels of TPACK showed that "preservice teachers understanding and application of TPACK" saw "significant increases between the respondents' pre- and post-test means for all seven TPACK subscales" (Baran et al., 2011, p. 372) indicating that deeper engagement in the TPACK framework sees an increase in the level of complexity through which it is experienced and actioned. In another study with professional postgraduate students enrolled on a programme in a school of education the introduction of TPACK and its use as a framework for teacher development saw that the "majority of students adopted digital pedagogies and implemented them in their classrooms" (Maor, 2013, p. 537) with at least one student (a primary school teacher) then initiating a professional development programme based on TPACK in their school. A further study by the same author saw participants shift their perspectives from one where they focussed attention on the digital technologies to one where they began to focus on the intersection between technology and pedagogy (TPK) through the emergence of digital

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pedagogies (Maor, 2016). This corresponds to some participants experiences within my own study whereby experiencing development through us of the TPACK framework helps promote the intersection of knowledge forms, particularly around technology.

*“it makes perfect sense when I look at it, doesn't it, sort of how technology can help me with your pedagogy and makes perfect sense” – Participant 1*

Additionally, this shift in thinking from single forms of knowledge towards intersections and integration aligns with the complexity element of the outcome space which indicates that a deeper immersion in TPACK moves the experience of users towards a more complex application of it. In one study where TPACK was used by the researcher as a lens through which to assess academic staff technology integration (but not explicitly used by academic staff as a framework for development) the results indicated that “most of the technology practices of faculty who participated in the survey are not content specific or used with best pedagogy practices.” and that “faculty need further professional development to integrate content specific technology paired with best instructional practices in order to achieve the rich overlap of TPaCK” (Martin, 2018, p. 1785). This suggests that participants ordinarily view their practices and their development through single knowledge forms, but that by using TPACK as a framework for their development helps support the increased complexity of the connected knowledge forms and that “faculty need more professional development to increase evidence of their TPaCK integration practices.” (2018, p. 1786). In their study Glowatz & O’Brien propose that the use of TPACK can “help the individual their understanding and awareness of the contextual influences of the TPACK framework” (2017b, p. 149) and this is reflected in my study with the highest level of complexity within the outcome space being where participants are evidencing synergy between the integration of forms of knowledge within TPACK to the context within which they and the framework exist. In one of the few studies of TPACK use in professional development in

higher education it is used as a framework to design a series of digital pedagogy workshops, specifically focussed on technology integration. By using TPACK as a framework for planning and designing professional development activities attendees of those workshops demonstrated specific learning in TK, TPCK and TCK, depending on the purpose of the workshop design (Jaipal-Jamani et al., 2015). This is something that participants alluded to in my study, the extent to which TPACK could be an embedded framework within the institution, whether that be as a mechanism to shape conversation *“if I was to take it forward more more usefully there'd be some some using it as a tool to be able to have further conversations would be the way that I would see that it would be really useful.”* (Participant O) or through a formal mechanism such as PDR *“Ideally, you'd be working towards slight movement of it over say a year or two. I'd see it might be a really useful thing to do for something like PDR”* (Participant O). These experiences of using TPACK in the wider context of an organisation is something which have additionally emerged through writings that have actually been published during the undertaking of my own study. In his study Elliot proposes that *“Developers of professional development programs linked to traditional academic offerings could use the TPACK framework as a blueprint”* (2018, p. 21). In the only higher education related study I was able to find where TPACK was the focus of the development experience the results suggested that *“using a faculty TPACK development approach aligned to faculty goals and the instructional design process,.....led to increased faculty confidence and TPACK.”* (Mourlam, 2017, p. 26) thus supporting the view of participants experiences of using TPACK at the highest complexity of context connected forms of knowledge (3D). Whilst it's not entirely possible to make a direct comparison between my study and others' because *“the major existent gap resides in studies examining faculty TPACK development in technology infusion contexts”* (Mourlam, 2017, p. 7), within a higher education setting it has been possible to draw upon wider experiences of TPACK from which to make a comparison. Although the outcome space for research question three is closely aligned to TPACK already, it is

possible to summarise the TPACK relational element in terms of participant experience as presented in the table below.

**Table 7 - Summary of RQ1c Outcome Space**

<b>Category of variation by which academic staff experience TPACK</b>	<b>Overview of category</b>	<b>TPACK relational element</b>
3D Context connected Forms of Knowledge	This is the most complex category of description presented through the experiences of participants and is one by which they both experience TPACK holistically as an interplay of all domains but they do so in the wider context of their institutional and professional environment.	Here participants are fully conversant with TPACK, with both an holistic approach to using the framework but also connecting its use with the wider contexts. These contexts both influence and are influenced by TPACK.
3C Integration of forms of knowledge	This category represents experiences of participants whereby they holistically experience the use of TPACK across all three domains. This is the most complex way in which the forms of knowledge within the framework can be experienced.	Participants experience as an integration of all forms of knowledge – they experience TPACK! This rich experience means participants connect the forms of knowledge in ways that inform an integrated development approach.
3B Intersections of forms of knowledge	TPACK is experienced through the interplay of two forms of knowledge. This increased complexity represents experiences where participants make use of TPACK for development in such a way as to experience more than one single knowledge form.	In TPACK these are represented as TCK, TPK and PCK. Here participants are able to experience TPACK at a sub domain level, making connections between them and their experiences of development.
3A Single form of knowledge	Participants experience TPACK in the context of their professional development as separate (core) knowledge domains. Using the framework at a low level of complexity with no interplay of knowledge domains or integration.	In the context of TPACK these activities are experienced in one of three of the forms of knowledge. Technology, Pedagogy or Content. Participants experience TPACK and development in these distinct areas.

### **8.5 Discussion of the extent to which the integration of TPACK effectively supports a more holistic approach to academic development?**

Research question two seeks to understand the extent to which the use of TPACK supports a more holistic approach to academic development, and more specifically the integration of “digital skills” as a component of it. As articulated through outcome space three, participant data suggest that their own reflections and experiences is one where TPACK and its underpinning philosophy is one which supports a more holistic framework and this operational model in support of their development.

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*“I think yeah the potential if we use this framework is that staff will think about their digital capabilities and their digital skills as a more integrated approach to their pedagogy and also their content. So yeah, definitely. I suppose if you're using this framework as a development model, it's difficult to get away from the fact that you're thinking about the three areas together rather than thinking about them separately.” – Participant L*

There is evidence in other studies that frameworks similar to TPACK have been successfully utilised to enhance the digital competences of teachers (Falloon, 2020) but that TPACK specifically “presents a holistic model that theorises the relationship between, and contribution of, technological, pedagogical and content knowledge” (2020, p. 2453). Some of this emphasis on a more holistic approach is predicated by observations that students themselves view technology and learning as symbiotic and inter-connected, particularly in the context of blended learning (Sharpe, Benfield, Roberts, et al., 2006). This is supported in some way through this research in so much as participants refer to the holistic way in TPACK supports their curriculum design and enhancement (description 2C) and the way in which technology is becoming equally important to the curriculum design as the content and pedagogy. The evidence from this study shows that the development of academic staff is closely associated with their roles and responsibilities. It is therefore reasonable to suggest that through using TPACK not solely as an academic development framework, but also as a reference point for curriculum design the holistic nature of both would be enhanced. Boud asserts that academic development should “promote a holistic view which acknowledges the staff member in context” (1999, p. 3) and through this study the evidence shows the way in which academic staff using the TPACK framework have experienced their development in a more holistic manner and that it not only supports formal processes such as PDRs but also how supports more informal conversations with colleagues. Ultimately the participant’s’ experiences of using TPACK leads us to the conclusion

that it's use as a framework for academic development leads academic staff towards a more holistic experience of development and more specifically encourages and supports a deeper integration of digital skills development alongside other aspects of their development.

“staff will think about their digital capabilities and their digital skills as a more integrated approach to their pedagogy and also their content” – Participant L

The impact of this will require a separate longitudinal study to fully understand the extent to which this approach benefits staff and students, but what the findings of this study demonstrate is that the use of TPACK ,and associated activities aligned to it, sets a strong foundation from which to build an holistic academic development model, as evidenced through the participants in this study. In the same way that TPACK has been proven through a number of studies to support a more holistic approach to teacher education (Jiménez Sierra et al., 2023), this study has proven that TPACK can also support a more holistic approach to academic staff development.

## **8.6 Chapter summary.**

This chapter presented a discussion of the research findings in comparison to existing literature and research relevant to the categories of description and outcomes spaces. Although there are no directly comparable studies against which to wholly compare the findings the chapter has presented the outcome spaces and the categories of description within them to make comparisons with a range of other studies, within differing contexts in relation to those particular experiences of using TPACK. This granular approach has presented a number of differences and similarities across a range of research domains which has enriched the understanding of this study but also offered complex insights into the areas of barriers to academic staff development, motivation for development, contexts for development and relationship between individual and organisational development of which this study crosses all those research areas. “Effective staff development is characterised by two components: the

individual's professional development and the organisational development process. The two combine in a partnership for staff development. An effective staff development process is supportive of the individual and beneficial for the organisation." (Marriss, 2011, p. 4).

From the quote above it is proposed that the concept of effective staff development is situated around both the individual and the organisation. This mirrors the experiences represented through the outcome spaces which has shown that within the context of an institutional use of the TPACK framework there are a range of professional development experiences that are representative of both individual and institutional needs. These institutional development needs are often defined in the literature as organisational development with a definition being "the process of initiating, creating and confronting needed changes as to make it possible for organisations to adapt to new conditions, to solve problems, to learn from experience" (Brown, 1992, p. 178). This same study goes on to observe that the process of organisational development is counter-intuitive to academic staff who have considerable freedom and as such approaches are often 'fragmented' and that "the tradition of staff development in the past has been one of concern for individual professional development without reference to departmental or institutional priorities and needs" (1992, p. 183). As previously evidenced in my study this fragmentation is presented through both the way in which staff access their development activities (informal to formal) and the way in which they plan those activities and the impact of them (low reach to high reach). However, contrary to the suggestion by Brown that there is a focus on individual rather than organisational development, the findings of my study suggest that perhaps thirty years after that study it is now possible to see a more inter-connected approach to academic development, whereby staff see a much stronger connection between their own individual development and the wider development needs of the organisation. Additionally, the way in which we now approach the development of academic staff should and

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can be more holistic when we make use of frameworks like TPACK to structure the identification, planning, implementation and reflection of academic staff development, particularly when time is a finite commodity and that time given for development is particularly limited.

The next and final chapter will conclude by reminding the reader of the original research questions being answered and summarising the findings, so as to draw conclusions of the understanding of the variation of experience of academic staff. Additionally, I will highlight the key contributions to knowledge that this study provides in relation to TPACK, academic staff development and phenomenography and finish with a discussion on some of the limitations of the study and suggestions for future research that can build upon this study.

## **Chapter 9: Conclusion**

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### **9.1 Introduction.**

This study set out to examine and understand the qualitatively different ways in which academic staff experienced professional development through use of the TPACK framework. This phenomenographic study was situated around three research questions:

1. What is the qualitative variation by which academic staff have experienced professional development through TPACK?
2. What is the qualitative variation by which staff identify and plan their professional development activities using the TPACK framework?
3. What is the qualitative variation by which staff experience TPACK as a framework for professional development?

In this chapter I will initially summarise the key findings of this research, drawing upon the previous chapters to highlight key points and outcomes. In the sections that follow I will specifically identify the contribution to knowledge that this study makes firstly in the broad area of academic staff development, with reference to digital skills development, secondly the contribution to knowledge in relation to the TPACK framework and finally its contribution to knowledge with regards to phenomenography. The limitations of the study are presented and explored towards the end of this chapter and followed by recommendations for potential areas for study based on this research.

### **9.2 Overview of key findings.**

In relation to the first research sub-question (RQ1a) the conceptions of the variation of experience were represented through five categories of description: development through conversation (1A), development through resources (1B), development through support (1C)

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development through internal activity (1D) and development through external activity (1E).

Hierarchically the relationship between these descriptions were represented on a continuum between the activities being informal to formal. These findings show that the experiences of development are wide and varied and that formal and informal mechanisms exist within the institution to meet the needs of participants which is an approach evidenced by other studies (Ferman, 2002; Hemmings et al., 2013; Marriss, 2011).

Participants identified and sought out different development types depending on the nature of their intention. Conversation (1A) was noted to usually be adhoc in nature, not necessarily pre-planned and sometimes occurring pre or post a more formal activity. These conversational development opportunities were also useful to help with cross-pollination of ideas between schools. Resources (1B) and support (1C) were most often experienced when participants were seeking to complete a specific task or solve a specific problem with 1C being predominantly used for support with technology related issues. Almost all of the participants made reference to the internal learning and teaching conference and 'DEAP' events run throughout the year by the educational development unit in the institution, but much fewer participants made reference to external development with barriers such as lack of time and lack of funding being cited as key challenges which may be the reason more participants did not refer to engaging in external activities. Phenomenography seeks to understand the hierarchy within the outcome space and in outcome space one this is presented in relation to the formality of the activity. Reading through the transcripts and analysing the data it was very clear that each of the activity types were valued equally in terms of the development contribution and participants did not make a distinction about each in relation to its value, but they did experience them at various level of complexity with regards to the informal/formal nature of them.

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With the second research sub-question (RQ1b), the findings show that the variation by which staff identify and plan their development is hierarchically presented on a continuum between development which has a low reach (focused on the individual) to that which has a high reach which has benefits for others. Whilst this study did not necessarily seek to understand motivations for undertaking development, it is evident from the categories of description that in pursuit of planning for their development participants are motivated based on the perceived need for the development and its value to them and others. At the lower end of the hierarchy, participants engage in development as a requirement (2A), usually an intuitional necessity and experienced as a distraction to their day-to-day work. However, whilst the perceived reach may be low, the engagement appears high due to the contractual and sometimes legal obligation of this type of development. Role related development and personal development emerged through those experiences presented through category of description relating to upskilling (2B) whereby participants planned their development activity based around their individual needs with a particular focus on role related development. It was through this description that participants made reference to leadership development, which is not immediately aligned to TPACK, but often the leadership development was in relation to their subject area, which very much aligns with content knowledge, or leadership in learning and teaching with alignment to pedagogical knowledge. Longer term development planning emerged through the description of 'development for career enhancement' (2C) whereby participants made reference to career ambitions (including professorship) and seeking out development activities in support of that agenda. A clear distinction between 2B and 2C is in relation to the future focus of the development. Whilst development associated with 2B was more situated around the here and now (short term) the planning of development in relation to 2C was identified as part of a longer process which may include a number of steps to the achieve the ultimate goal.

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Identifying development for student experience (2D) and curriculum enhancement (2E) were discussed collectively in the previous chapter around the broader role of development for educational enhancement (Jones & Wisker, 2012) although the experience of planning development were distinctly varied enough to see the emergence of separate categories of description. Academic development planning, in relation to enhancing the student experience was often a conscious decision by participants to improve the learning and teaching experience (in class or through online spaces) with a focus on their experience as learners and the relationship between the learner and teacher. Often these would relate to the use of digital tools but also more generally considerations for more active learning approaches to improve student engagement. These experiences were distinct from those related to curriculum design and development where the focus of attention was often on the course content rather than on the experience of it. One participant (J) made reference to how the course development and designed mapped to the course domains of TPACK and was articulated through this.

The third outcome space represents the variation by which academic staff experience the use of TPACK as a framework for their development (RQ1c). What emerged from the analysis of the participant data was the relationship between the framework and the various contexts and levels of the organisation at which it was considered and the complexity by which the framework itself was experienced. At the lowest and least complex level in the hierarchy was using the framework use in single knowledge forms (TK, PK, CK) and as presented through 3A, this was the most common experience but was perhaps to be expected given the nature of the workshop experience based on using TPACK with the starting point being to consider development activities contained within forms of knowledge. Experiencing TPACK as a framework for professional development in its single knowledge forms does not necessarily mean that participants see just a compartmentalised approach to their development, but that their

engagement with and understanding of TPACK was less complex than others who viewed it more holistically. Where use and understanding of TPACK became more complex, and thus more holistic, participants' experiences moved into the intersections of the framework (TPK, TCK, PCK) at the intersections of forms of knowledge (3B). It is here where participants begin to make meaningful connections between the TPACK forms of knowledge, recognising that when seeking development related to a specific tool or technology, that a pedagogical or content element should be present too. The original intention of the TPACK is that it is a "framework for teacher knowledge and technology integration" (Matthew J. Koehler & Mishra, 2008, p. 3) and it is through the integration of forms of knowledge (3C) that TPACK is being experienced as an holistic framework. Encouragingly eleven of the sixteen participants presented experiences of this integration through their interviews and all participants considered that the framework was of value to their development planning and activities. This was perhaps not unexpected considering that the TPACK workshop they had all engaged in was designed to encourage their professional development planning more holistically as part of a need to embed digital development more effectively. However, what also emerged was participants considerations for how TPACK could be more effectively actioned with consideration for the contexts within which they were working. These contextual elements are the element of the framework often overlooked by both users of the framework and also researchers of, but which Mishra and Koehler consider to essential to the framework.

There were examples of where participants had experienced TPACK in the context of course or programme planning and making use of TPACK to ensure all aspects of that framework were discussed, identify and acknowledged as part of the curriculum design process. Even where participants had not experienced first-hand the use of TPACK in this way some did propose that this was a potential use of the framework in the future based on their individual use of it. The

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use of TPACK for departmental planning was less frequently experienced, but where participants did have some leadership responsibility, they articulated how TPACK can be used at a departmental level to map the development needs of staff and subsequently plan departmental activities (often linked to the PDR process) with some consideration for the use of TPACK at an institutional level. Although the use of TPACK was not, at the time of this study, a formal requirement in the institution it was being used by a central educational development service to support an embedded approach to digital skills development and a couple of participants proposed the use TPACK across the institution, both as a mechanism for clarifying and setting expectation but additionally to then label and map development opportunities from all areas of the organisation to it, thus representing the most complex experience of TPACK within the range of individual and institutional contexts.

With regards to the second research question, this thesis presents the case that using TPACK encourages users to think about their development more holistically, and more specifically encourages them to connect what have previously been siloed development activities in such a way as to map development activities across a number of TPACK domains. A number of participants make specific reference to the integrated nature of TPACK and the way in which it supports an integrated approach to their development. Additionally, participants suggest that making use of TPACK as an institutional-wide framework for academic development mapping brings significant benefits to the way in which they plan, engage and reflect on their professional development for academic purposes. It is therefore possible to be confident in the hypothesis that using TPACK as a framework for the development of academic staff not only improves the integrated nature of that development, but more importantly situates their digital skills development as a core area for development alongside subject and pedagogic development.

### **9.3 Contribution to knowledge on TPACK.**

TPACK originated as a framework for teacher education (M. J. Koehler & Mishra, 2009) and as such research associated with the framework is dominated but studies relating to teacher development or teacher experiences of using TPACK in their development (Voogt et al., 2013) but there have been very limited empirical studies of TPACK in Higher Education (Mourlam, 2017). Additionally, over the years TPACK has also emerged as a research framework for use in helping researchers to “understand technology integration in learning and teaching” (Baran et al., 2011, p. 370) but again the focus of this is often predicated on pre-university teaching (particularly K12) and there is a distinct lack of higher education contexts.

Therefore, this study contributes significant knowledge, not only to TPACK use in higher education but also TPACK as a framework for academic staff development, something which might be considered a unique element of this study, having not been able to find other studies examining the use of TPACK as a framework in this way. Of the studies identified where TPACK has been used in a higher education context (excluding teacher education programmes which use TPACK as part of the content or analysis of the teacher training course) very few deal with the use of TPACK with regards to the professional development of academic staff. The first study which offers a comparison is that where “all university lecturers, learn how to use their technological, pedagogical and content knowledge in an integrated, or TPACK, way” (Brouwer et al., 2013, p. 95), utilising TPACK as a framework to instruct lecturers on module design and as a structure for the design of their own modules. Whilst this touches upon the category of description in this study which represents experiences relating to curriculum enhancement (2E) it does not study the broader experiences of staff using TPACK. Goradia (2018) moves closer to understanding academic experiences of TPACK in a study which examines the perspectives of academics using technologies for learning and teaching and using TPACK as a “lens through which teaching practices can be viewed and reflected upon thereby making the learning

environment more conducive to student learning” (2018, p. 58) but again this only touches on one specific aspect of the experience which has emerged through this study, that being staff use of TPACK as a framework for planning development in relation to student experience activity (2D).

Perhaps the most significant study for comparison is one which proposes a model for use in “faculty” TPACK development. The study seeks to understand the way in which faculty members made use of their learning through understanding TPACK and ultimately the development of curriculum-based projects aligned to it. The results of this study suggest that the effectiveness of technology related development experiences of academic staff are best done longitudinally and with the support of others (Mourlam, 2017), again this was something which emerged from participants experiences within my own study, drawing upon support of educational development units and other support mechanisms as part of a development experience.

What my study uniquely presents is how academic staff experience their professional development through the use of TPACK and how the framework can be used as both a reflective tool but also as a reference point for planning and identifying development needs. Perhaps more significantly the analysis shows that TPACK can operate at differing levels of the organisation, as a framework for individual development but also as a framework for strategic use. There are no previous studies which have examined the experiences of academic staff using TPACK in as much detail and in this way the study adds a significant amount of new knowledge to this area.

#### **9.4 Contribution to knowledge on academic development and digital skills.**

Mourlam states “Missing from the current literature on technocentric faculty development, however, are descriptions of faculty experiences.” (2017, p. 22)

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This study is significant in the fact that it addresses this gap, which has still not been adequately filled, with finite ways through which participants have experienced their development. More specifically this study shows that despite using a technologically situated framework it actually normalises discussions around technology use and supports an holistic approach through which technology, pedagogy and content are considered equally through discussions. This study further supports previous research in identifying how formal and informal activities combine to provide an overall offering of development opportunities to academic staff (Ferman, 2002; Leslie, 2014; Zacher et al., 2019) but this study extends our understanding of these experiences by hierarchically presenting these various experiences as categories of description, through the outcome space. This will help educational development units and educational developers to understand their role in academic development activity and recognise that their work is part of a personal experience within which individual staff also have hidden informal activities supporting their development, and as such educational developers should be mindful of those when planning development. As portrayed through the literature review the challenges that exist around digital skills development are well known (Garcia et al., 2013; Handley, 2018; Mercader & Gairín, 2020) and yet within this study the experiences of participants did not specifically identify barriers unique to their digital skills development and so one conclusion that can be drawn from this is that although the data may suggest that there are barriers to the digital development of academic staff (Voce et al., 2016; Walker et al., 2014) these are not unique to this area of development and are in fact pervasive across all development activity (Hemmings et al., 2013). In fact, this study challenges the notion that the barriers to staff digital development are unique and demonstrates that a framework such as TPACK encourages and engages academic staff in an holistic view of their development. This is presented through the way in which participants experience both their pedagogical, disciplinary (content) and technological development from a

similar standpoint and that all three forms of knowledge are pervasive across all types of development activity, as shown through the first outcome space.

Whilst this study did not specifically set out to explore motivation, the experiences of the participants in relation to the way they plan and identify their development (RQ1b) is an indicator of the reasons for which they plan and identify development. Although a number of studies relating to academic development make reference to motivation (Brown, 1992; Habib & Johannesen, 2014; Leslie, 2014; Quinn, 2012) they often lack detail around specificity of such motivations. This study provides an insight into those motivations as represented through the variation of experiences of development which is motivated from a requirement to participate through to motivation based on development for curriculum enhancement. Whilst there are studies which explore the experiences of academic staff and their development these are sometimes related to specific staff groups such as casual staff (McComb et al., 2021) or around a specific activity like e-learning (Spratt et al., 2000; Wilson, 2012) or a specific role of an academic such as researcher (Zacher et al., 2019). Whilst there are some studies which take a more holistic view of staff development, these can usually be categorised into either broad approaches to staff development (Blackwell & Blackmore, 2003; Leibowitz, 2014; Sergeeva et al., 2014) or career focussed agendas (Hemmings et al., 2013; Leslie, 2014; Zacher et al., 2019). This study adds knowledge on academic development uniquely through a phenomenographic lens from which the variation of those experiences from across an institution have been presented. There are no other studies of this nature that I have been able to identify as part of this research process.

As a secondary contribution this thesis has, through the workshop description (Chapter 4), also uniquely demonstrated the use of a TPACK development survey and the resulting spider diagram as a mechanism through which participants are able to self-identify their development time (where they currently spend it and where they need to spend it) as well as the extent to which

this is influenced by institutional expectations. This adds a unique dimension to the way in which TPACK has been utilised in the context of the academic development of staff and their experiences of using this mapping were specifically commented on as part of their experience.

“it was interesting that I saw that, you know, my time needed graph which was pushing across into quite a different area to what I thought was being required of me” –

Participant O

“so actually looking at this [spider diagram] I found it really interesting because it felt like it revealed something to me which I kind of already knew.” Participant C

These examples indicate that using TPACK in this way not only acts as a tool for self-identification of development needs, but also helps staff make sense of their development through a more holistic approach.

## **9.5 Contribution to knowledge on phenomenography.**

This study follows a phenomenographic approach, in the traditional sense of a non-dualist second-order methodology and as such there are aspects of this study which will be of interest to other phenomenographic researchers. Traditionally, phenomenography has predominantly been associated with the experience of learners (often students) and this was the basis of its origin (Marton, 2004) and as a research approach there are still a very limited number of researchers in higher education using this methodology (Tight, 2016) and so any additional studies are a welcome resource to many researchers who may be starting out on their own journey to be a phenomenographic researcher. In particular there are some criticisms that phenomenographic researchers are not often clear about the process involved in reducing the impact of their own views in the interpretation process (Alsop & Tompsett, 2006; Ashworth & Lucas, 1998) and in this study I have described in some detail the process and intention of bracketing, and in particular how I subsequently processed the data and anonymised participants

in such a way as to disconnect myself from the experience of the interview and the process of analysis. Additionally, critics of phenomenography bemoan the lack of a clear process for the analysis of the data itself (Yates et al., 2012) and yet I was able to specifically draw upon a cyclical process for the data analysis process and describe in detail my approach to that data analysis, thus acknowledging that existing practices do exist but at the same time needing to recognise that it may not be desirable to specify an exact process for all phenomenographic studies as that fluidity is an inherent part of its philosophy. The phenomenographic interview is fundamental to the methodology in so far as it must allow participants to describe their experiences without influence and to ensure that they can authentically shape their own responses (Bruce, 1994). The interview questions used for the interviews in this study were sufficiently open to allow the participant to freely share their experience, but additionally a number of pre-prepared secondary questions were available and used to help bring the focus back to the original question. This approach of pre-preparing additional questions is not common in phenomenographic interviewing which is often more open and immediately responsive. However, in my earlier studies using phenomenography this has meant that some participants would sometimes spend large proportions of the time talking less about their experiences of the phenomenon being studied and more about another aspect of their practice. These additional pre-prepared questions were a useful mechanism for keeping a focus on them sharing their experience and thus providing clearer understanding of the variations of those experiences, and so in preparing additional questions as part of this study I was able to achieve a more consistent approach to interviewing and an increased parity of experience across interviews and as such it should be considered as a useful mechanism not usually associated with phenomenographic studies. Perhaps the most useful contribution to knowledge on phenomenography is the specificity of the phenomenon itself. Whilst there is no discernible literature on the size or nature of the phenomenon, the majority of studies using this method are very often experiences which

examine what has been learned. “The question asked is: How do the group of people we are interested in understand, or experience, this or that concept or phenomenon before and/or after studying it?” (Booth, 1997, p. 138). In this sense the phenomenon experienced is less tangible and not predicated on a single event but on an overall experience of ‘learning’. The difference in my study is that specific interventions and activities form a unique part of the wider experience of academic development, and that a specific framework is the focus of that phenomenon. In this way my study explores experiences of specific events (the TPACK mapping and workshops) as well as the broader developmental experience but also through the use of the TPACK framework. The phenomenon therefore is multi-faceted but also narrowed, in so much as it is not just a broad representation of academic staff experiences of their development, but it is examining their experiences of development with specific reference to the TPACK framework. This unique approach demonstrates how phenomenographic approaches might be used to examine very specific phenomenon (perhaps even single instances) something which was not perhaps its originally designed intent, but certainly something that this study demonstrates will be of value in the future. As previously discussed in an earlier chapter (5.4) , as part of the rationale for using phenomenography I also indicated my approach to providing details of the phenomenon being experienced (Chapter 4). Previous studies using phenomenography provide very little description of the phenomenon, mainly due to the fact that the studies are extremely broad, such as how children experience learning , or only just slightly narrower such as the experience of students learning physics (Ornek, 2008). In each example here the phenomenon is judged to be understood at enough of a level for the reader to be able to contextualise the results without a detailed explanation. However, in my study the phenomenon is not widely understood or experienced by others, as it’s a local implementation, albeit of a widely known framework. Therefore through my thesis I have uniquely applied the theoretical framework and methodology of phenomenography to an experience which is narrower than most, but retaining its core

theoretical underpinning which is to “identify the different ways in which people experience, interpret, understand, perceive, or conceptualize a certain phenomenon” and through that “not only to identify people’s conceptions about or “ways of experiencing” a given phenomenon, but to organize those “ways of experiencing” into conceptual categories” (Orgill, 2012, p. 1). I hope this will give others the confidence to make use of phenomenography as a way to understand participants’ experiences of a range of phenomenon, whether they be very broad or much narrower in scope. After all phenomenography seeks to understand the different ways in which people experience a certain “phenomenon or aspect of reality” (2012, p. 1) and these experiences are equally valid at the micro or macro level.

## **9.6 Limitations.**

Reflecting on the experience of this study it is important to acknowledge that some limitations exist and how other researchers may seek to overcome this in future studies. The first of these limitations is situated around being a lone researcher. Being a solo researcher is a challenging proposition regardless of the methodology chosen for a research study but can be particularly problematic in phenomenographic studies. The first challenge is in the research design, particularly with limited access to other phenomenographic researchers on the programme with whom to navigate these complex discussions to ensure that the methodology is understood way before the actual research begins. I was grateful for the communities that exist across the world that I was able to connect with digitally, through Facebook groups, Twitter conversations, blogs and online communities as these helped me tremendously in the design and implementation of the study. However, the biggest challenge for phenomenographic study is during the data collection and analysis phase, which I described in some detail because of the need to clearly articulate the process. A number of phenomenographic studies make use of a ‘research team’ (Alsop & Tompsett, 2006; J. Bowden, 2005) and although this presents its own challenges it is fundamental to the validity of the research that “the relationship between the researcher and

the phenomenon and the influence of that relationship on the research outcomes need to be minimised in the analysis phase as well as in the data collection phase.” (J. Bowden, 2005, p. 15).

In a team setting it is entirely possible for a team member to carry out the interviews (ensuring consistency of approach), another team member to undertake first stage analysis and another to undertake a secondary stage with all three discussing and evaluating the findings. As I described in the analysis chapter I used a number of mechanisms to separate the interview process from the analysis and to minimise any potential for me to distort the truth of the variation of experiences it is very clear that where it is possible to approach the analysis phase of the process without the previous experience of the interviews there is a natural ‘bracketing’ process which does not exist with a solo researcher and so through the identified bracketing process I overcame this in a couple of ways. The first was to talk through my findings with my supervisor, including sharing the process behind the analysis, and sharing the findings of the categories of description and outcome space as soon as they emerged for the purpose of validation. Secondly I was offered the opportunity to be able to informally discuss a sample of my very early analysis with a phenomenographic researcher which not only helped validate my own analysis but also provided a useful opportunity to discuss in more detail their own approach to analysis (this directly led to me exploring the eight stage process as previously described in the methodology section) but ultimately it must be acknowledged that for a lone researcher it may not be possible for a researcher to be fully ‘bracketed’ in the purest sense of a second order perspective (Ashworth & Lucas, 2000). The second limitation relates to participant selection. A key element of phenomenography is that participants should be representative enough of the population in order that “the spread of characteristics is intended to maximize conceptual variations in the data” (Sin, 2010, p. 313) in so far as reasonably possible. The selection process for this study is limited by the very fact that academic staff had to have experienced the phenomenon (Hajar,

2020) which in this case was use of the TPACK framework, and as such the pool of potential participants was smaller than if the study was more broadly examining the development experiences of staff and as such may have reduced opportunities to “contribute to the constitution of the full extent of the various ways of experiencing the phenomenon” (Collier-Reed et al., 2009, p. 47). Whilst participants are representative of the discipline areas from across the institution where this study takes place it must be acknowledged that the majority of participants were mid-late career academics with no early career academics identified, this was further impacted by the fact that this was a volunteer selection process and as such there was no additional process by which to identify and recruit specific participants based on particular criteria. However, the sample size and requirement for participants to have lived the experience have been assured, as well as a variation of experience from across the organisation and so the data can be considered valid in the context of those parameters. In future studies it may be preferred that researchers actively seek out participants with more specific criteria, but this may impact on the ability to recruit participants as volunteers which will itself have implications.

The third and final limitation comes down to the limitation of my own experience as a phenomenographic researcher. Bowden (2005) identifies a set of precautions, particularly in relation to the interview process and whilst a number of these were followed there is a fine balance between the freedom of conversation and consistency of approach in the interview.

Whilst I have adopted recognised approaches my experience of phenomenographic interviewing is limited (despite having undertaken test interviews prior to the study). As I reflect on the interview process I am slightly critical of some aspects of it, in particular the extent to which having a set of questions may have been overly structured, although this didn't appear to stifle the conversational approach or limit the variation of experiences, and noting that “the idea in phenomenographic interviewing is to limit inputs by the researcher to planned sequences that

are primarily designed to introduce the phenomenon to the interviewee whose relation to it is being investigated” (J. Bowden, 2005, p. 14) However, overall I am confident that the semi-structured nature of the interviews facilitated the necessary environment for participants to freely express their experiences and that in phenomenographic research there are acceptable variations in practice as with other qualitative methods (Tight, 2016) but that ultimately there is probably no substitute for experience and this must be acknowledged.

### **9.7 Future research.**

This study focusses specifically around the use of TPACK in the context of an single HEI and so there is considerable scope to replicate this study at other institutions where a framework is being used to support the development of academic staff (even if that is not TPACK). However, perhaps the biggest opportunity for future study would be a phenomenographic study of the lived experiences in relation to academic staff (digital) development from across the (UK) higher education sector. Whilst there are studies which have sought to understand the experiences of academic staff and their staff development there is scope for a phenomenographic approach to this through which to present the variation of experiences which exist. Future research might also consider focussing on specific groups of staff (e.g. early career academics) using a phenomenographic approach. One observation is that due to the very nature of phenomenography, in seeking to understand the finite ways in which participants experience a phenomenon, the context of many studies using this methodology are broad and therefore opportunities exist to make use of phenomenography as a research methodology at a more granular level . Studies of this nature will help educational developers and educational development units understand more clearly the experiences of academic staff in relation to their development and help them more appropriately design development opportunities that meet the needs of the individuals and the organisation. Ultimately, this study and others that may follow it enrich our knowledge and understanding of the experiences of academic staff and their

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professional development, additionally this study supports the suggestion that using a framework like TPACK to support a more integrated approach to digital skills development not only enriches the technological knowledge of academic staff but also their pedagogical and content knowledge in a more coherent and holistic manner, ultimately resulting in enhancements to academic careers, student experience and curriculum.

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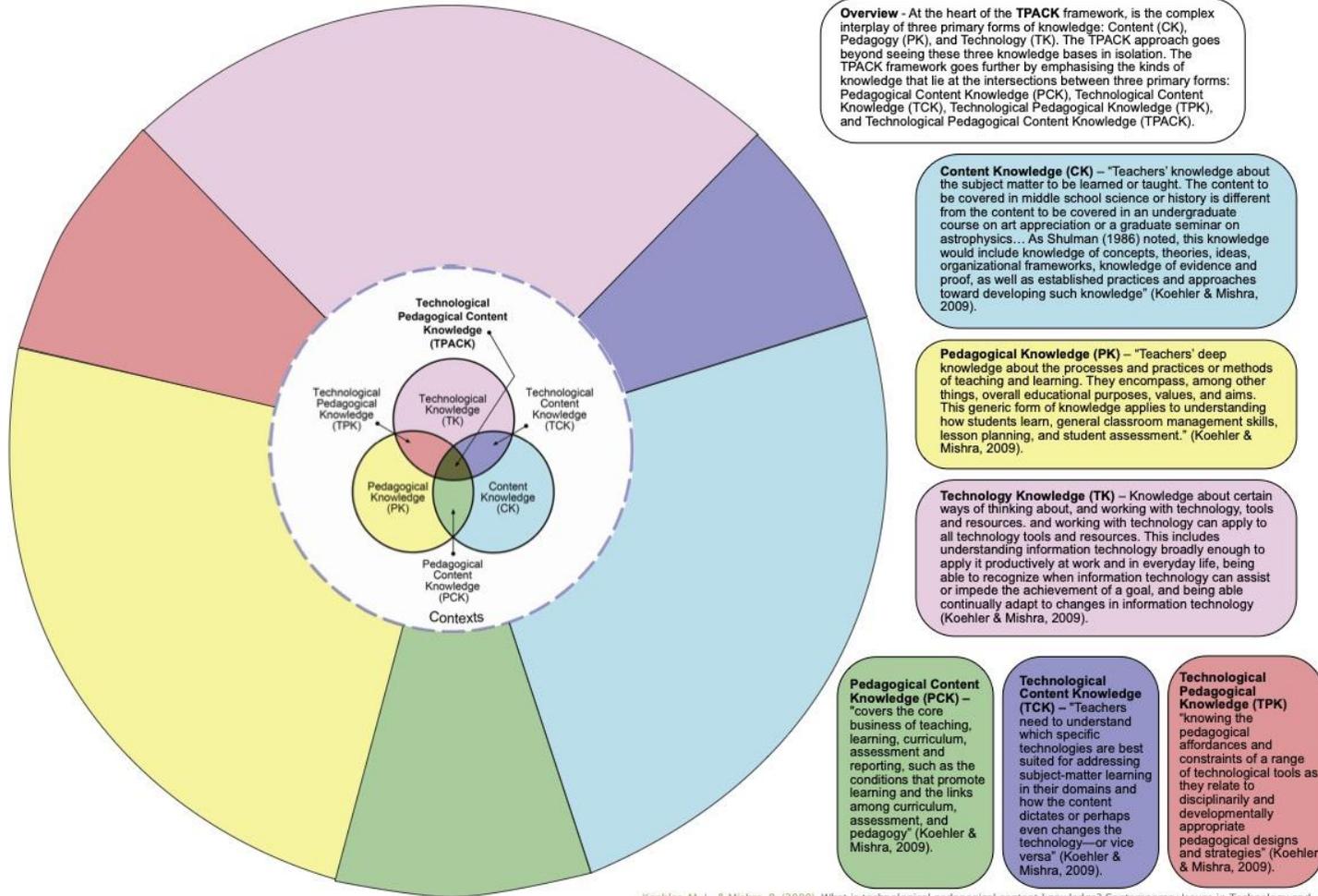


## Appendix A: Figure 24 - TPACK Workshop Mapping Activity

The image shows a Padlet board titled "TPACK Development Activites" by Simon Thomson, created 2 months ago. The board is a grid of 24 black boxes, each representing an activity mapped to a specific TPACK domain. The domains are arranged in a 3x8 grid. The background of the board is a grayscale cityscape.

Content Knowledge (CK)	Pedagogic Knowledge (PK)	Technological Knowledge (TK)	Pedagogical-Content Knowledge (PCK)	Technological-Content Knowledge (TCK)	Technological-Pedagogical Knowledge (TPK)	Technological-Pedagogical-Content Knowledge (TPACK)
<b>Conference</b> A discipline specific conference with a focus on learning more about advances in my subject area.	<b>DEAP Learning and Teaching Conference</b> Attending annual learning and teaching conference, particularly focusing on new pedagogy	<b>IT Workshop</b> Workshop on using Office 365	<b>DEAP Digital</b> Attending specific sessions which look at innovative tools and services and how to use them in L&T	<b>Library</b> Learning to use box of broadcasts with specific consideration for my subject area and content	<b>DEAP Digital Session</b> Attended a student led session on their experiences of using MyBeckett	<b>Polling System</b> using a polling system in lectures to ascertain student understanding.
<b>Journals &amp; Books</b> Self development - using journals and books to stay up to date with my discipline area.	<b>HEA Conference</b> National conference on learning & teaching and professional recognition.	<b>Learning Systems Workshop</b> Learning how to set up quizzes and discussion boards in MyBeckett.	<b>NTF Symposium</b> Attended a session on innovative assessment practices and feedback in the context of my own subject area.	<b>Software Training</b> Learning to use In-Play software for sport.	<b>DEAP Digital</b> OneNote Session (using it for learning & teaching).	<b>Audio Feedback</b> Using formative audio feedback to help students understand the subject.
<b>Themed Conferences / Events</b> Not necessarily subject specific but perhaps focused on particular area (e.g. sustainability / project management) which might be applicable in an educational context.		<b>Adobe Connect</b> Learning how to set up and use adobe connect.		<b>My Beckett</b> Structuring MyBeckett to make access to learning materials.	<b>Grademark</b> Session on using grademark for feedback.	<b>Peer Observations</b> Undertaking peer observations of teaching which includes use of technology in L&T.
		<b>Specialist Equipment</b> Undertaking training to use specialist sport equipment.		<b>Library Database</b> Learning to use the library database and reading lists effectively.	<b>Panopto</b> Learning to use panopto to support revision.	<b>HEA Fellowship Mentoring</b> Engaging with my mentor for completing HEA fellowship.
		<b>Dartfish</b> Learning to use Dartfish data analysis software.			<b>Panopto</b> Learning to use panopto for flipped learning.	<b>School Away Day Session</b> Session of flipped classroom with evidence of student experience and feedback.
		<b>SEMS</b> Attending SEMS training for using in student support.			<b>Games-Based Learning</b> using technology for games based learning (Kahoot)	<b>Games Based Learning</b> Course team workshop in using Kahoot for improving student

## Appendix B: Figure 25 – TPACK Development mapping template



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