Faculty of Humanities and Social Sciences

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The alignment of policy and practice for the career-long professional learning of teachers in Scotland

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PhD

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19 March 2024

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Abbreviations and acronyms

ASC	Aberdeen Science Centre
ASE	Association for Science Education
ASL	Additional Support for Learning
BGE	Broad General Education
CDA	Critical Discourse Analysis
CDS	Critical Discourse Studies
CERN	European Organisation for Nuclear Research
CfE	Curriculum for Excellence
CLPL	Career-long Professional Learning
CoP	Community of Practice
COSLA	Convention of Scottish Local Authorities
CPD	Continuing Professional Development
DHT	Depute Headteacher
DSC	Dundee Science Centre
DYW	Developing the Young Workforce
ES	Education Scotland
ESA	European Space Agency
GIRFEC	Getting It Right For Every Child
GSC	Glasgow Science Centre
GTCS	General Teaching Council for Scotland
HGIOS	How Good Is Our School?
HMIe	His/Her Majesty's Inspectorate of Education
HoD	Head of Department, a middle leader in a secondary school
HoF	Head of Faculty, a middle leader in a secondary school
ICEA	International Council of Educational Advisers
IDL	Interdisciplinary Learning
IGTP	Four purposes of professional learning – Insight, Goals, Techniques, and Practice
IOP	Institute of Physics
ITE	Initial Teacher Education
LNCT	Local Negotiating Committee for Teachers

NIF	National Improvement Framework
NLC	Networked Learning Community
NQ	National Qualification
OECD	Organisation of Economic Co-operation and Development
PAT	Planned Activity Time
PBL	Project-based Learning
PD	Professional Development
PER	Physics Education Research
PG	Professional Growth
PGCE	Postgraduate Certificate in Education
PGCert	Postgraduate Certificate
PGDE	Postgraduate/Professional Graduate Diploma in Education
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
PL	Professional Learning
PLC	Professional Learning Community
PLD	Professional Learning and Development
PRD	Professional Review and Development
PT	Principal Teacher, a middle leader in a secondary school
PU	Professional Update
RIC	Regional Improvement Collaborative
RIT	Regional Improvement Team
S1-6	Secondary 1 to Secondary 6, the year groups in a secondary school
SCEL	Scottish College for Educational Leadership
SEC	Scottish Education Council
SfFR	GTCS Professional Standard for Full Registration
SfCLPL	GTCS Professional Standard for Career-long Professional Learning
SfH	GTCS Professional Standard for Headship
SfML	GTCS Professional Standard for Middle Leadership
SfPR	GTCS Professional Standard for Provisional Registration
SG	Scottish Government
SIP	School Improvement Plan
SLT	Senior Leadership Team

SNCT	Scottish Negotiating Committee for Teachers
SPUTNIK	Scottish Physics Teachers' News and Comment email forum
SQA	Scottish Qualifications Authority
SSERC	SSERC, formerly Scottish School Education Research Centre and previously SSSERC, Scottish School Science Equipment Research Centre
STEM	Science, Engineering, Technology, and Mathematics
TALIS	Teaching and Learning International Survey
TIMSS	Trends in International Mathematics and Science Study
TLC	Teacher Learning Community
WTA	Working Time Agreement

Glossary

Broad General Education

The phase of education which includes primary and lower secondary (Secondary 1 to Secondary 3, S1-S3).

Macro-level

National policymaking level where the main actors in this level are the Scottish Government and senior figures in national agencies.

Managerial professionalism

Forms of professionalism that are primarily driven by accountability pressures and which results in the promotion of performativity.

Meso-level

The middle-level in the education system responsible for interpreting and implementing national policy guidance and providing support for teachers and other practitioners in schools. The main actors in this level are officers of national agencies, regional improvement collaboratives and local authorities, and senior leaders in schools.

Micro-level

The level in the education system where teaching and learning occurs, i.e., the classroom. The main actors in this level are teachers, including school middle managers (Principal Teachers or Heads of Faculty), and other practitioners such as technicians and support staff.

“Middle”

See meso-level.

Nano-level

The instructional or pedagogical core occurring in schools and classrooms and consisting of the interactions between teachers, their pupils, and the subject matter being taught.

Probationer

A teacher in their first year of employment after their initial teacher education. In Scotland probationer teachers are guaranteed employment in a state funded school on the Teacher Induction Scheme which includes mentoring and professional learning.

Professional development

A term little used in this thesis, other than in direct quotes, due to ambiguity in its use in practice and literature. My preferred term for learning activities for teachers is professional learning, and the term describing changes which result from that is professional growth.

Professional growth

Positive changes in the knowledge, skills, beliefs, attitudes, and confidence of teachers resulting from professional learning activities.

Professional learning

Activities undertaken by teachers with the aim of changing and improving the knowledge, skills, beliefs, attitudes, and confidence of teachers.

Subject-specific professional learning

Professional learning in the context of the subject(s) or topic(s) taught by a teacher. This includes professional learning about the subject content knowledge of the subject, pedagogical content knowledge required to teach the subject, curriculum knowledge for the subject, and general pedagogical knowledge set in the context of the subject.

Senior Phase

The upper secondary phase of education (Secondary 4 to Secondary 6, S4-S6).

Transformative professionalism

Forms of professionalism promoting teacher agency and including many overlapping terms such as activist teacher professionalism, collaborative professionalism, critical professionalism, and democratic professionalism.

Abstract

In Scotland, as elsewhere, it is generally recognised that the quality of teaching is arguably the most important factor in children's learning, and therefore on the overall performance of the education system. The quality of teaching can be improved through good quality teacher professional learning.

There is a lack of empirical research on teachers' lived experiences of professional learning. Using a case-study approach (Yin, 2018), this study gathers evidence from three sources: a systematic analysis of national policy documents relating to teacher professional learning, from physics teachers across the north of Scotland, and from school and system leaders in Scotland. The experiences of teachers are analysed against a theoretical framework based on Kennedy's models of professional learning (Kennedy, 2014), Timperley's principles of effective professional learning (Timperley, 2008), and a model of professional learning synthesised from models of professional growth and enquiry-based professional learning (Bryk et al., 2010; Clarke & Hollingsworth, 2002; Cobb et al., 2018; Rowland, 2013). By interviewing teachers and leaders this study aims to achieve a deep and nuanced understanding of professional learning practices and of policy implementation. A pragmatic, interpretive, abductive approach is used to analyse data.

A comparison is made to ascertain how well aligned professional learning practice is with the policy as stated in the documents and with the literature on teacher professional learning.

The study finds that most of the teacher professional learning is transmissive rather than transformative with little evidence of collaborative enquiry-based approaches or enquiry as stance. There is a general policy misalignment, especially through the meso-level of the Scottish education system which is dominated by cultures of managerial rather than transformative professionalism. This neither serves the macro-level desire for transformative change nor the micro-level and nano-level desire for improved instruction and is unlikely to give improvements in pupil outcomes or system performance.

Chapter 1 Introduction

This study analyses the professional learning policy of Scottish education, how this is implemented, and how that relates to professional learning practice as experienced by a group of physics teachers across the north of Scotland. In this section I describe why I have chosen to study this topic, particularly in relation to my own background, context, and professional interests, as well as the benefits of conducting this study.

1.1 My background and the rationale for the study

Before embarking on this study, I spent 35 years teaching physics in four Scottish secondary schools, almost all that time as a head of department or principal teacher of physics (PT Physics). The first three of the schools were state funded secondary schools and the fourth an independent school, all in the north-east of Scotland. During this time, I have also organised conferences and other professional learning events, presented talks and workshops, co-ordinated professional learning to support curriculum developments, and supported the networking of teachers, particularly in science and physics. This has not been restricted to Scotland but has involved travel on professional learning activities as both consumer and presenter to more than a dozen countries. This led to me becoming involved in Scottish educational policy activities, initially in the development of curriculum and assessment in physics, electronics, and science but then also in committees and bodies sometimes providing advice to, and on other occasions lobbying, government and its agencies. My involvement in these activities resulted in me becoming relatively well read, for someone in my role, in many issues relevant to the professional learning of physics teachers in Scotland as well as having extensive lived experience of the topic at several levels including as a classroom teacher and as a teacher educator, and having some insight into the policymaking process.

My experience generally developed in an ad hoc and organic manner, however, in 2016 the opportunity to undertake more structured reading and research into teacher education opened for me in the form of the MSc in Science Teacher Education at the University of Oxford. I received some support for doing so from the Institute of Physics (IOP), the professional body and learned society for physics in the UK and Ireland (Institute of Physics, n.d.). Since 2003, alongside my full-time teaching job, I had worked for the IOP on both a

freelance and volunteer basis providing professional learning for teachers of physics. Around the time of completing the MSc and beginning this PhD I became a full-time employee of the IOP as its Education Manager for Scotland where teacher education and education policy work comprise a large part of my remit. My MSc dissertation was titled "*Networked professional learning of physics teachers in a remote area of Scotland*" (Farmer, 2018). It built on a previous research assignment investigating the professional learning needs, the professional learning most valued by, and the barriers to accessing such professional learning for physics teachers across four local authorities in the north-east of Scotland (Farmer & Childs, 2022). For my dissertation I researched the networking and professional learning of a group of physics teachers in one local authority in the north of Scotland which allowed me to investigate how relatively isolated physics teachers working in mostly small or medium sized secondary schools in a rural area, itself remote from the major population centres in Scotland, could access subject-specific professional learning and develop a networked learning community. The reading and research for the MSc together with my wide professional experience highlighted that the professional learning experiences and practices of many teachers neither matches well the literature describing good professional learning practices nor what is indicated in much national policy.

In my professional judgement, whilst there are many strengths in the processes of both initial teacher education and the ongoing career-long professional learning of teachers in Scotland, opportunities are being missed and improvements could be made. It also became clear that there has been little research conducted on the actual professional learning practices of teachers in Scotland or into how that lived experience relates to the stated policies that outline what that experience ought to be, which can themselves lack clarity or involve contradiction. This background set the scene for this study and a deeper delve into the actual professional learning journeys of teachers in Scotland and into the policy milieu in which teacher professional learning takes place, from national government and agencies, through regional improvement collaboratives (RICs), local authorities, schools, faculties, and departments to individual teachers and their classrooms; the macro-level, meso-level, and micro-level of the Scottish education system.

Such a study has the potential to be vast, therefore a case-study approach was taken, and certain parameters were restricted to reduce the study to a manageable size. Firstly, the decision to restrict the teachers to full-time physics teachers in Scottish state funded

secondary schools who are either at the top of the main salary scale with at least six years of teaching experience or in a principal teacher role. This ensured a reasonable length of professional learning journey for each of the teacher participants in the study. As can be seen from my experience described above, this is a community with which I am very familiar, to which I have good access, and in which I have significant symbolic capital (Bourdieu, 1977) and credibility due to my long and active participation and contribution to it. As such this means there is an 'insider' element to my research giving me a good understanding of the context of the teacher participants involved and the ability to understand readily the data they provided. However, as an employee of the IOP, a well-regarded professional body, conducting the study under the umbrella of the University of Strathclyde, and having worked latterly in a Scottish independent school, it also means I am somewhat of an 'outsider' to the local authority governed education system. I am also an 'outsider' when it comes to interviewing school and system leaders about professional learning policy and its implementation as, despite my extensive professional activities, I remained predominantly a classroom teacher throughout most of my career and am now an employee of a 'third sector' professional body working outwith the main structures of Scottish education. A second restriction was to focus on participants from the regional improvement collaborative (RIC) covering the north of Scotland, or from national agencies with a locus in that RIC. This decision was made partly for convenience reasons, partly due to my greater familiarity with potential participants in that region, and that lessons learned from this relatively rural and remote area might more readily transferred to less remote areas than the other way around.

The focus on physics teachers as participants has a convenience element, as this is the community with which I work and have experience. This means this study can be considered a case study with its focus on teachers of just one of the many subjects taught in Scottish secondary schools. To teach in Scotland all teachers must be registered with the General Teaching Council for Scotland, and for secondary teachers this means being registered in one or more subjects. The organisation of secondary schools into departments or faculties is a universal phenomenon (Siskin 1994, p9) and has long historical and cultural roots but these are more than just administrative units as they act as communities of practice (Wenger, 1998) or as discourse communities (Tytler et al., 2011, p878) and provide the professional identity and context for many secondary teachers (Brooks, 2016; Helms, 1998; Siskin, 1994). As well as generic pedagogical knowledge, secondary teachers have subject content knowledge and pedagogical content knowledge (Kind, 2009; Shulman, 1986, 1987) which is specific to the

subject(s) they teach. There are therefore differences between physics teachers and teachers of other subjects, however, in the context of this study these are likely to have relatively little significance because teachers of other subjects work within the same national policy framework for curriculum, assessment, teacher registration and professional learning. They therefore receive similar advice and guidance from national agencies such as Education Scotland, the Scottish Qualifications Authority, and the General Teaching Council for Scotland. Likewise, the support from the RIC, local authorities, and senior leadership in schools does not appear to vary significantly between different subjects. Physics teachers do benefit from active professional bodies such as the IOP, but other subject areas also have professional associations and learned societies. In recent years, due to recurring concerns about insufficient numbers of young people and graduates entering the employment market with appropriate science, technology, engineering, and mathematics (STEM) knowledge and skills (Institution of Engineering and Technology, 2019; STEM Learning, 2018), there have been a number of developments to improve and expand education in the STEM subjects (Scottish Government, 2017b), including in physics, which may not have parallels in other subjects. However, despite some differences it is hoped that findings from this study can not only be used to inform and improve the professional learning journeys of physics teachers in Scotland, but lessons can be learned which, with appropriate interpretation, can be used to inform and improve the professional learning journeys of teachers in other subjects, and professional learning policy more generally, in what is a relatively under-researched field.

1.2 Description of the study

This study aims to investigate the alignment of professional learning policy through the different levels of Scottish education, from that in the local context of individual teachers through to national level, and how this policy then impacts on the actual professional learning experienced by teachers. As there is a comparative element to the study it consists of four main parts. The first is a critical analysis of Scottish education policy as it relates to the professional learning of teachers. The second part is the gathering of information from fourteen school and system leaders in the meso-level of the Scottish education system regarding their expectations of the professional learning of teachers and how they support and facilitate this within the Scottish education system's policy framework. The third is the identification of the professional learning journeys taken by a sample of twelve physics teachers. This consisted of mapping the professional learning journey of teachers through

their careers until the starting point of the study, and logging the professional learning undertaken by the teachers during a 12-month period; one cycle of a school year. This involved reflection by participants to identify the benefits and impacts of the professional learning as well as how it relates to policy as they understand it, along with reflection on the barriers that may have prevented them from undertaking the professional learning they may have sought or valued but were unable to undertake. The fourth part draws on the data from the first three parts allowing a comparison between the policy as written and how it is enacted through the lived experiences of teachers and leaders within the system, together with a consideration of how the policy and practice compares to what is known about teacher professional learning from the literature.

To investigate and analyse the professional learning of teachers this thesis begins, in chapter 2, by defining the important terms used in the study, many of which do not have a well agreed meaning or are often used inconsistently in practice. It then goes on to explore the nature of professionalism since this underpins any exploration of professional learning. The historical policy background of professional learning in Scotland is then reviewed with particular attention to the main developments during the 21st Century which have shaped the professional learning of Scottish teachers and the conception of professionalism promoted. Chapter 3 follows with a review of how teachers learn and grow professionally, including models describing professional learning, and an exploration of important factors which influence how well professional learning occurs in practice such as autonomy, agency, collaboration and leadership. After a description of the methodology of the study in chapter 4, its findings are described in chapter 5 with the main themes emerging from the data discussed in chapter 6. Conclusions are drawn and recommendations made in chapter 7. By investigating and documenting the professional learning journeys as lived by teachers and how these are supported and facilitated by school and system leaders, and how this relates to the literature on best practice professional learning and to educational policy, this study makes a valuable and rare contribution to the field of teacher professional learning, not only in terms of Scottish physics education at a time of significant educational reform, but also more generically in an under-researched area (Boylan et al., 2018, p133; Webster-Wright, 2009, p704).

It was originally intended to gather interview data during 2020-2021 using in-person interviews with teachers and leaders. This was not possible due to the COVID-19 pandemic

and online interviews were conducted instead during 2020-2022. This had the benefit of allowing me to review video recordings to assist with transcription. It also probably resulted in a more consistent approach to the interviews than would have been the case interviewing participants in-person in their workplaces. Although participants were interviewed during times of restricted social contact and disrupted working, they were asked to answer in terms of practices and expectations in more normal times. However, the data gathered also reflects the changes in practices and expectations due to the increased online working promoted by the COVID-19 pandemic.

Chapter 2 The context of the study

This chapter sets out the context of the study by defining key terms used and exploring the policy background that has informed both the professional learning of the teachers being studied as well as the development of the focus of the study and its research questions.

2.1 Language and definitions

For a profession where clear communication is at its heart, the use of language in education can often be problematic. Terms are often not defined clearly, and this leads to certain terms being used with different meanings by different users, or others ascribing the same meaning to different terms. A well-accepted universal language has not yet developed fully; education has been described as an "*immature profession*" (Carnine, 2000, p9). Therefore, whilst the usage of terms varies in the literature it is important that the terms used in this thesis are properly defined in order that the arguments made can be followed consistently.

2.1.1 Professional learning, professional development, and professional growth

The terms professional learning (PL) and professional development (PD) are used almost interchangeably in much of the literature and in the practice of teacher education. The term professional growth (PG) is used less frequently. A range of variations of these terms are also used such as continuing professional development (CPD), professional learning and development (PLD), and career-long professional learning (CLPL); a term used frequently in Scotland.

Weston and Clay (2018, p5) consider the terms professional learning and professional development to be used interchangeably and it to be unhelpful to try and separate them out. Czerniawski et al. (2018, p3) state that professional learning and professional development are 'portmanteau terms' describing the formal and informal processes whereby teachers improve their practice. There does appear to be some split in usage of the terms professional learning and professional development along national lines, for example, in literature from England and the USA the term professional development is used more commonly when describing in-service teacher education activities whilst in recent years in literature from Scotland and Canada the term professional learning tends to be the preferred term.

From Canada, Fullan and Hargreaves (2016, p3) prefer the use of the term professional learning to describe activities undertaken by teachers. These could include attending conferences or events, working with colleagues to share good practice or on collaborative enquiry activities, or reading or other individual activities resulting in teachers learning something new. They reject the use of the term professional development to describe such activities but define professional development as a change in the teacher as a professional, referring to previous work of Hargreaves (2003) "*It is through personal and professional development that teachers build character, maturity and virtues in themselves and others, making their schools into moral communities*" (p48). Such a change in the teacher as a professional is what Clarke and Hollingsworth (2002) describe as professional growth.

In Scotland, the Donaldson Report (Donaldson, 2010) reviewed teacher education and whilst widely using the term CPD also introduced the term "*career-long learning*" (p60). The analysis conducted by Watson and Michael (2015) indicates Donaldson used the term CPD 199 times, but the term professional learning only 25 times, in his report. Shortly after, in their response to the Donaldson report, the National Partnership Group used the term CPD 75 times but professional learning 175 times (National Partnership Group, 2012; Watson & Michael, 2015, p262). This change in terminology was further signalled in 2012, when the General Teaching Council for Scotland introduced new professional standard for the 'career-long professional learning' of teachers (GTCS, 2012b), and across all of its new standards did not use the term CPD once. Around the same time the online tool 'CPDFind', designed to allow teachers to identify suitable CPD opportunities, was replaced by 'Professional Learning Find' on the Education Scotland website. Watson and Michael (2015) quote how the rationale for this was set out "*in typical policy rhetoric*" on the Education Scotland website:

> "*Career-long professional learning (CLPL) builds on current strengths of CPD and extends the concept of the enhanced professional. It sees teachers as professionals taking responsibility for their own learning and development, exercising increasing professional autonomy enabling them to embrace change and better meet the needs of children and young people.*" (p262)

The use of the term professional learning has subsequently become cemented in Scottish policy documentation (Education Scotland, 2019a), even although CPD may still be a term heard in many school staffrooms.

If fit-for-purpose professional learning is viewed as leading to professional development the two concepts are nevertheless closely intertwined, and it is unsurprising that the terms professional learning and professional development are often found joined in different combinations in the literature. Despite defining professional learning and professional development separately Fullan and Hargreaves (2016, p3) conflate the two terms again when they introduce the term 'professional learning and development' (PLD) to describe the sweet-spot of the overlapping area of a Venn diagram of professional learning and professional development. This acknowledges that not all professional learning activities necessarily result in professional development. Common examples of this might be teachers learning how to use a new IT system or addressing child protection issues. Whilst these are important and essential issues for the safe and smooth running of schools they will not necessarily result in the professional growth of teachers. Similarly Cordingley (2015, p234) uses the term 'continuing professional development and learning' (CPDL) to describe activities impacting on teachers and their pupils.

Although professional learning and professional development may remain contested terms, in this thesis the term professional learning will be used to describe activities undertaken by teachers and professional development as the growth in the teacher that hopefully occurs because of these activities. It is important to acknowledge that some, mainly in the US, have defined the terms professional learning and professional development in exactly the opposite way (Easton, 2008; Wei et al., 2009, p1). Due to the confusion that may still occur in the use of the term professional development, and the historical baggage that it may bring for some, its use will be minimised throughout this thesis and the term professional growth, as used by Clarke and Hollingsworth (2002), used to denote the hopefully beneficial change that results from professional learning activities fit for most purposes, although I will retain the use of professional development when used in quotations from the literature and interviews.

2.1.2 Defining the 'middle' or meso-level in education

The terms the 'middle' and 'meso-level' have increasingly been used to describe parts of the education system, however, what these terms describe is not always made clear. This is partly due to it being possible to apply the terms micro-level, meso-level and macro-level to any organisation or system, or sub-system within a larger one. However, in relation to this

study the system is Scottish education. The meso-level can also be used to describe structures, functions and people. Actors operating in the meso-level have an important role in ensuring the alignment of policy and practice throughout the education system.

In their review of Scottish education, Hargreaves et al. (OECD, 2015) describe the middle as "*covering such organisations as local authorities, teachers' and head teachers' associations, and different networks and collaboratives*" (p139) and recommended "*reinforcing the "middle" through fostering the mutual support and learning across LAs [local authorities] … together with collegiate activity of schools, networks and communities*" (p111). Hargreaves et al. (2018) state that the concept of "*Leading from the Middle*" (p3) was invented by educators in Ontario and has spread to influence other systems, including those of Singapore, New Zealand, Scotland and Wales. It is therefore important to define what is meant by the 'middle' or 'meso-level' and how it relates to the 'micro-level' and 'macro-level' of the Scottish education system. Firstly, it is important to make clear that here the 'middle' refers to the whole education system and not just individual schools. The term 'middle leader' is used widely to describe principal teachers (PT), i.e., those staff in head of department or head of faculty roles in Scottish secondary schools. These middle leaders have curriculum or pastoral roles and are very much based in the classroom and dealing directly with pupils. They also have an essential role in schools of leading teaching and learning of pupils and the professional learning of staff within a subject domain and thereby securing better outcomes for pupils (Harris & Jones, 2017). Therefore, along with classroom teachers and support staff, principal teachers form the staff in the 'micro-level' of the Scottish education system. The instructional interactions of teachers, the subject matter and teaching materials, and the pupils within a classroom can be considered the 'nano-level' which is arguably the most important level of the system as that is where the teaching and learning of pupils predominantly occurs.

Senior leadership teams (SLT) in Scottish secondary schools typically consist of a headteacher and a few depute headteachers. They generally have no, or very little, timetabled teaching time with pupils, and particularly for headteachers, where this occurs it is often due to individual choice to do so rather than a requirement or expectation. Therefore, as they have limited classroom contact with pupils and their substantive role is the leadership and management of their school they are very much at the boundary between the 'micro-level'

and 'meso-level'. Due to their predominantly leadership role and lack of classroom contact I consider them part of the 'meso-level' or 'middle' of the education system.

In Scotland, apart from a small number of independent, fee-paying schools, schools are state funded and governed through thirty-two local authorities. These local authorities vary in size from having two or three secondary schools to having twenty or more secondary schools, along with their associated primary schools. These local authorities have traditionally provided central services such as human resource management, quality assurance, and pedagogical support, although in recent years due to budgetary pressures the level of pedagogical support available to teachers and schools from centrally employed local authority staff has decreased (Hastings et al., 2015; Livingston, 2012).

In 2017, the Scottish Government supported the formation of six regional improvement collaboratives (RICs). The aim of these RICs is to promote and improve collaborative working and networks across and between local authorities, and provide support for headteachers, teachers, and practitioners through dedicated teams of professionals (Scottish Government, 2017a, p21). Alongside the introduction of the RICs, Education Scotland, the national "*executive agency charged with supporting quality and improvement in Scottish education and thereby securing the delivery of better learning experiences and outcomes for Scottish learners of all ages*" (Education Scotland, n.d.-b) has been restructured from having national teams of staff into having six regional teams of officers aligned on the geographical areas of the RICs (Sharratt, 2020). Furthermore, as well as a support and capacity building role, Education Scotland also has a national scrutiny and inspection role, for schools and local authorities (Education Scotland, n.d.-d).

That local authorities, RICs, and Education Scotland are all operating on a regional basis to support teachers and schools places them in the 'meso-level' of the Scottish education system. However, Education Scotland is a national agency and its chief executive reports directly to Scottish Government ministers, which could be argued as a 'macro-level' function. Scottish Government ministers and the Scottish Government's Learning Directorate are responsible for national education policy and are therefore clearly in the 'macro-level' of the Scottish education system.

Within the Scottish education system there are other organisations operating in the 'meso-level' which provide support, including professional learning, to staff working in the 'micro-

level'. For example, for the sciences these include SSERC (SSERC, n.d.) and professional bodies such as the IOP (Institute of Physics, n.d.) and Association for Science Education (ASE, n.d.-a), as well as universities, further education colleges, and the four Scottish Science Centres (ASC, n.d.; DSC, n.d.; Dynamic Earth, n.d.; GSC, n.d.).

Concerns regarding the clarity of purpose and function of those with roles in the 'middle' of the Scottish education system were expressed by the International Committee of Education Advisors appointed by the Scottish Government to review and advise on the development of the Scottish education system. "*It is important not to over clutter the middle tier and to ensure that the responsibilities for action, for each of the new bodies, remain clear and do not overlap*" (ICEA, 2018, p25).

In summary:

Micro-level actors:

- Teachers
- Support staff in schools
- Middle leaders in schools (PT)

Meso-level actors:

- Senior Leadership Teams in schools (SLT)
- Local Authorities (LA)
- Regional Improvement Collaboratives (RICs)
- Education Scotland
- National support organisations and professional associations

Macro-level actors:

- Scottish Government
- General Teaching Council for Scotland

Whilst this is not an exhaustive list it hopefully gives a reasonably well-defined definition of the boundaries between levels. However, as with many things in education nothing is completely black and white and there are always some shades of grey involved. This definition is also broadly in line with the levels described by Priestley, Biesta and Robinson

(2015, p152) in relation to Scottish education policy and practices. The macro-level applying to policy formation, the meso-level to policy interpretation. and the micro-level to policy enactment.

Figure 1 illustrates the relationship between the levels with the main interactions and influences shown by the arrows. However, although this shows the levels as neatly nested boxes the boundaries between them can be blurred and are certainly permeable, and it is possible for some actors to work across levels.

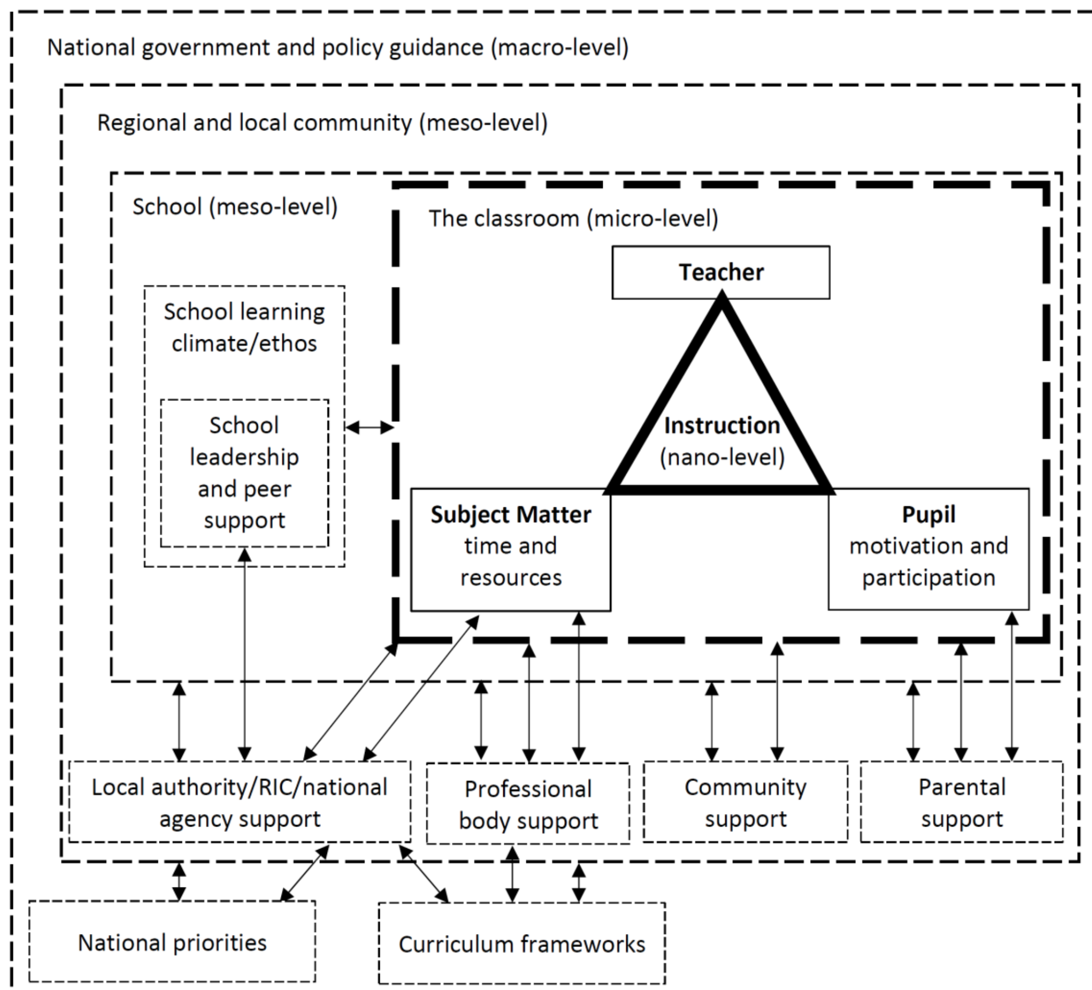


Figure 1: The working context of teachers, adapted from Bryk et al. (2010, pp 48-51)

As well as exploring and defining such terms as the 'middle', an understanding of the nature of professionalism is central to any investigation into professional learning and the interplay between policy and practice. Different professional learning activities promote different conceptions of professionalism which influences the nature of professional growth, teacher

agency and identity. Professionalism can mean different things to different people, and there are several different conceptions of professionalism in the literature. This is discussed next so that it can be referred to in subsequent chapters.

2.2 The nature of professionalism

To explore professional learning requires clarity about what is meant by the complex and dynamic concepts of a 'profession' and of 'professionalism'. A more extensive discussion of these difficult to define concepts can be found on the Stuart Physics blog (Farmer, 2023a), however, a summary of points most pertinent to this study is provided below.

A professional occupation is traditionally seen as one which is based on:

- the use of skills based on theoretical knowledge,
- education and training in those skills is certificated by examination,
- a code of professional conduct oriented towards the 'public good',
- a powerful professional organisation (Whitty, 2008, p28).

Teaching in Scotland can certainly claim to be consistent with the first three. Teaching has a distinctive professional knowledge base which includes Shulman's (1986) pedagogical content knowledge, or the range of knowledges described by Rowland and colleagues (2005, 2013) in their Knowledge Quartet. To teach in Scotland one requires a degree, to undertake initial teacher education (ITE), and to meet the General Teaching Council for Scotland's standards for registration as a teacher in Scotland (GTCS, 2021b) which includes statements on: social justice, integrity, trust and respect, and professional commitment. Whether teaching is consistent with the fourth is perhaps more debatable, and indeed may be part of the reason that this discussion is necessary.

By analysing the place of teaching and its political context in the UK, particularly in England, Whitty (2008) identified four modes, or conceptions, of professionalism:

- traditional – where teachers are trusted members of society,
- managerial – where the state asserts expectations of teachers,
- collaborative – which focuses on inter-profession collaboration,
- democratic – where teachers are agents of change.

Kennedy, Barlow and MacGregor (2012, p5) see these four conceptions not so much as discrete categories of professionalism but ways of explaining the existence of different manifestations of power. How power relationships are enacted will result in and from the different professional cultures predominant under the different conceptions of professionalism. The way in which professionalism is conceptualised within the profession by policymakers and through policy can therefore have a significant impact on the behaviour and efficacy of the profession itself and the enactment and effects of educational policy.

Sachs (2003b) introduces 'activist teacher professionalism' as a form of 'transformative professionalism'. It overlaps with Whitty's concepts of collaborative and democratic professionalism and with Hargreaves and O'Connor's (2018) 'collaborative professionalism'. Boylan et al. (2023), in reviewing the literature in this area, acknowledge there are many overlapping terms used for related constructs and classify activist, transformative, and democratic professionalism as 'critical professionalism' which they describe as including teachers not only being agents of change but also working collaboratively. Sachs states that the development of an activist teacher profession relies on teachers developing an activist identity, which itself can be traced back in origin to Dewey's ideas around democracy in education (Dewey, 1916; Sachs, 2003b, p130), where teachers believe they can effect meaningful change and construct their own self-narratives. Sachs acknowledges this is not straightforward to develop, nor is it easily acquired in a climate where managerialism is strong (p134) and where cultures of compliance can dominate. Sachs states that achieving an activist teacher profession is premised on developing three concepts: trust, active trust and generative politics, all necessary conditions for a politics of transformation to emerge.

Hargreaves and O'Connor (2018) describe collaborative professionalism as going beyond teachers merely collaborating, both with each other and with others, but transforming teaching and learning through a form of professionalism based on ten tenets: collective autonomy; collective efficacy; collective inquiry; collective responsibility; collective initiative; mutual dialogue; joint work; common meaning and purpose; collaborating with students, and big-picture thinking for all (Hargreaves & O'Connor, 2018, pp6-7). This emphasises the professionalism not just of the individual but also of the group, whatever form that community of practice (Wenger, 1998) takes. Hargreaves and Fullan (2012), drawing on the ideas of Bourdieu (1986), have promoted the use of the concept of 'professional capital', itself composed of the three components 'human capital', 'social capital' and 'decisional

capital', as describing the desirable outcome in which professional learning promoting transformative professionalism ought to result. They contrast this with a deficit oriented 'business capital' approach to professional learning consistent with a managerial conception of professionalism.

For teachers in Scotland, perhaps the most readily available definition, or at least description, of professionalism can be obtained in the documentation of the General Teaching Council for Scotland (GTCS). Whilst such a definition may not be stated concisely in any one of its documents it has published a position paper on teacher professionalism and professional learning (GTCS, 2017). It states that teacher professionalism is "*firmly rooted in our values, beliefs and dispositions*" (p1) and goes on to describe, visually in a diagram, see figure 2, the key principles on which teacher professionalism in Scotland is built. Collaborative professionalism is clearly an important aspect of the description and it also "*locates teachers as key agents of educational change*" (p3) making reference to the work of leading academics in the field of teacher professionalism and teacher agency (Hargreaves & Fullan, 2012; Priestley et al., 2015; Sachs, 2016). Tom Hamilton, former Director of Education, Registration and Professional Learning at the GTCS, describes there being a "*GTCS model of the teacher*" (Hamilton, 2018, p877) on which it has based its documents such as professional standards and guidelines. He lists several attributes and acknowledges the debt that ought to be paid to the work of Sachs, Hargreaves, and others such as Stenhouse, Fullan, Darling-Hammond and Cochran-Smith in informing this conception of a model teacher. Authors such as these are not generally referenced in GTCS documents such as its professional standards, as is also often the case in many documents from the Scottish Government or national agencies where references to academic research are a scarcity. The general lack of references could be argued as a means of controlling the narrative of the documents (Scott, 2000, p20). According to Humes et al. (2018, p972) the Scottish Government claim their policies are evidence informed but that its record is patchy at best. It appears those within the GTCS responsible for writing its documents have at least drawn on some research and evidence, but the exact nature and extent of this research and evidence is not clear, and its documents are certainly not as well referenced as they might be, or it could be argued, ought to be.

Echoing Sachs, one of the attributes listed by Hamilton is that teachers should be "*autonomous while recognising their place within the system*". Hamilton describes a new

Figure 2: Key principles of teacher professionalism in Scotland (GTCS, 2017, p2)

hybrid form of professionalism which encompasses a professional wish for empowerment, innovation, and autonomy but recognises the public need for quality assurance and accountability. By adopting a hybrid model of professionalism there is clearly then scope for different interpretations and tensions between more managerial or more transformative conceptions of professionalism to manifest themselves across the education system.

The nature of professionalism, and hence professional learning promoted as a result, is influenced by the policy environment and therefore I next investigate the significant Scottish educational policy developments as they relate to professionalism and professional learning.

2.3 Policy background

So far, this thesis includes references to various organisations and structures within Scottish education. To better set these in context, the policy background of Scottish education is now described further, particularly as it relates to teacher professionalism and professional learning. I began my teaching career in 1984 just weeks before the beginning of industrial action which led to the Main review of teachers' pay and conditions. It was the settlement following Sir Peter Main's report (Main, 1986) that first introduced an expectation and entitlement that all teachers participate in both in-service days and professional learning as part of their contract, in effect the basic conception of professional learning that has been maintained to the present day. Early in my review of literature for this study I therefore considered the policy initiatives affecting teacher professional learning since that time, and their implementation, all things I have experienced as a practising teacher. A significant resource facilitating this are the five editions of *Scottish Education* (Bryce et al., 2013, 2018; Bryce & Humes, 1999, 2003, 2008). These provide a rich source of information and analysis of the main developments in Scottish education, both from a perspective of the time of each edition plus with an element of hindsight in subsequent editions. Figure 3 shows the timeline of the major policy developments considered in this section. A more extensive description and discussion of the developments on this timeline can be found on the Stuart Physics blog (Farmer, 2023b), including a discussion of what has been called the "*Scottish Policy Style*" (Cairney & McGarvey, 2013, p154; Hulme & Kennedy, 2016, p93). A systematic analysis of the most recent and relevant teacher professional learning national policy documents can also be found in chapter 5.1. However, in the following pages a summary of relevant aspects of the policy background is provided.

2.3.1 The context for, and history of, teacher professional learning in Scotland up to 1999

For much of the 20th Century, colleges of education were funded by central government to provide 'free' in-service training for teachers. This was very much a provider-led system with the providers deciding on the 'training' available and whether teachers participated in this was very much up to the individual rather than there being any systemic expectation.

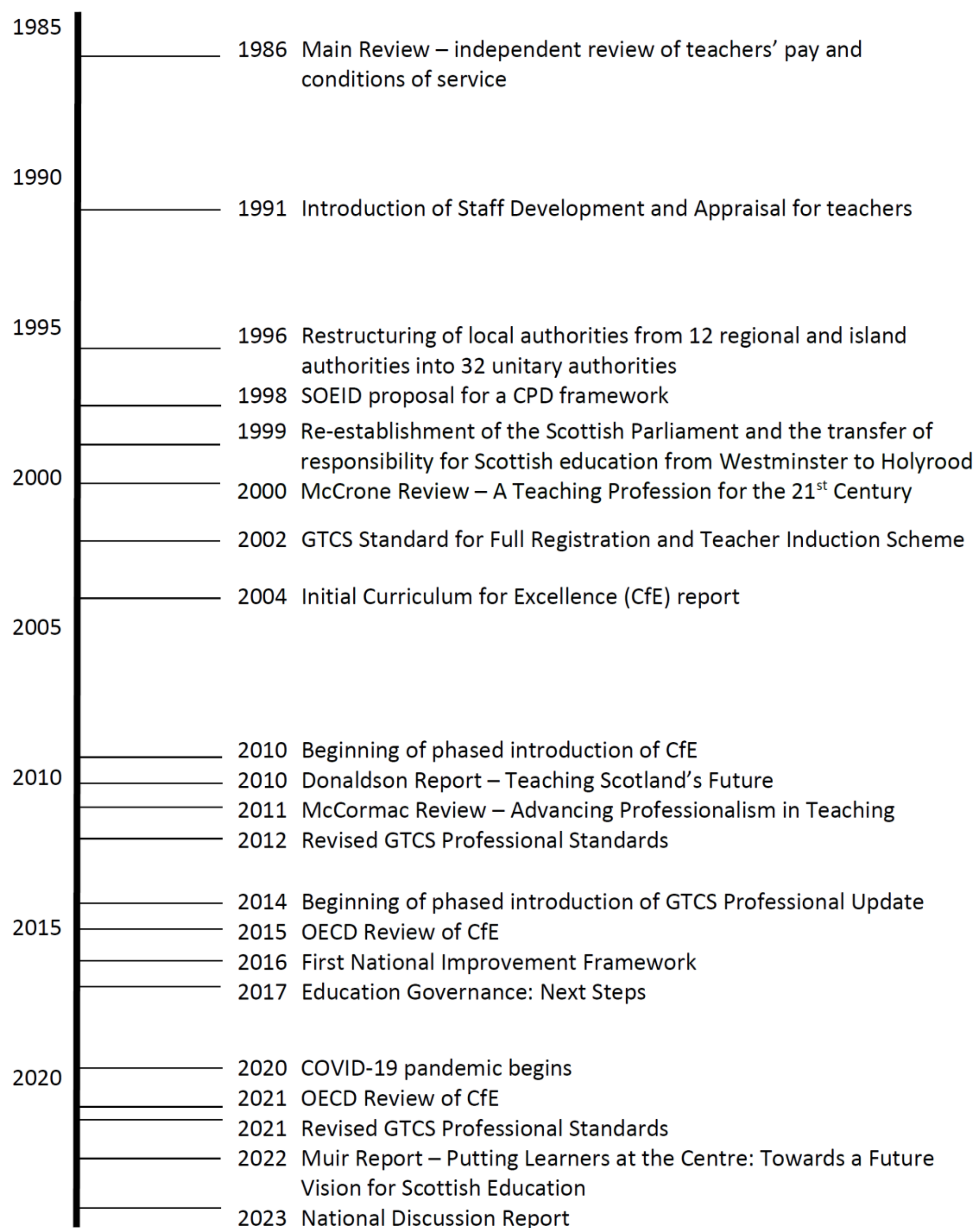


Figure 3: Timeline of major development affecting teacher professional learning in Scotland

However, this funding was reduced and ended in the 1980s and 1990s. Following an extended period of teacher industrial action, the inquiry into teachers' pay and conditions of service led by Sir Peter Main (Main, 1986), recognised the importance of regular and

systematic professional learning based in schools. The settlement following the Main Report resulted in the introduction of five in-service days per annum and 50 hours of planned activity time (PAT) in school but outwith normal teaching hours. As a result, professional learning became more school-led, and the use of this teacher professional learning time under the control of schools. A national programme of appraisal was introduced during the early-1990s (Marker, 1999, p920; SOED, 1991). These two developments introduced a tension between a transformative conception of professionalism with teachers identifying their own individual professional learning needs through appraisal and the more managerial approach to professional learning provided in schools, which was generally not held in high regard by teachers (Marker, 1999, pp921-2).

In 1996 the 12 regional and island education authorities were restructured into 32 local authorities. Their smaller size, and it being a time of financial stringency, meant that the level of central support available to schools and teachers was much reduced. Those central staff remaining tended to take on greater accountability-driven quality assurance roles rather than supportive ones such as subject advisors (Gatherer 2013, p981). A focus on standards and competencies was reinforced by the technicist language of the inspection framework How Good Is Our School? (HGIOS) which was first introduced by Her Majesty's Inspectorate of Education in 1996. The fourth, and current, edition of HGIOS (Education Scotland, 2015) is analysed in relation to professionalism and professional learning in chapter 5.1.3. These developments implied a business model of education and a managerial conception of teacher professionalism dominated by target-setting and performance management measures. This scenario may explain, at least in part, why Watson and Fox (2015) report, two decades after its introduction, that the take up in appraisal, or Professional Review and Development (PRD) as it became known, has been "*undeniably patchy both in terms of overall implementation and the rigour with which it is pursued*" (p135). Teachers had not been willing to campaign for professional learning at the expense of salaries and other conditions of service such as reduced class sizes. Local authorities had regularly sacrificed professional learning in order to meet their other statutory duties, and government, despite advocating for it, had not provided the necessary resources for it (Marker, 1999, p924). These are all situations that could be argued continue to the present day and result in a continued separation of rhetoric from reality.

Alongside the developments in appraisal, including the introduction of staff development coordinators in schools (O'Brien & MacBeath, 1999), there was consideration of introducing a framework of continuing professional development for teachers in Scotland (SOEID, 1998; Sutherland, 1997), and although this did not result in a formal framework it inevitably informed that which followed.

2.3.2 Developments during the 21st century

The prominence of education in the political discourse in Scotland has been raised since 1999 as education is one of the main policy areas devolved to the Scottish Parliament. During the 21st Century there have been several major policy developments in Scottish education, which have had an impact on teacher professional learning to some degree. These have included: the McCrone Report (McCrone, 2000), and its subsequent agreement (SEED, 2001); Curriculum for Excellence (Curriculum Review Group, 2004); the Donaldson Report (Donaldson, 2010); the McCormac Report (McCormac, 2011); the introduction of a suite of GTCS professional standards (GTCS, 2012a, 2012b, 2012c) and their revision (GTCS, 2021a, 2021b, 2021c, 2021d); the National Improvement Framework (Scottish Government, 2016b), and developments in educational governance (Scottish Government, 2017a, 2019c). These will now be summarised in turn.

McCrone

During the 1990s there was growing discontent within the teaching profession at the continuing decline in the real values of the salaries won during the industrial action that led to the Main Report (Main, 1986) and subsequent agreement. Professor Gavin McCrone was appointed to lead an inquiry into teachers' pay and conditions of service. The review's findings (McCrone, 2000) was used by the stakeholders involved as the starting point for a negotiated agreement (SEED, 2001). This agreement did not include all recommendations as originally stated in the McCrone Report, but the basic principles were taken forward including an entitlement of 35 hours per annum of professional learning, the introduction of the chartered teacher scheme designed to reward teachers who wished to develop their careers by staying in the classroom rather than following a management path, and improved induction arrangements for new teachers. McCrone described the situation with regard to the induction of new teachers as "*little short of scandalous*" (McCrone, 2000, p7).

Agreement was reached following the McCrone inquiry largely because it resulted in significantly increased teacher salaries which redressed the decline since the Main review. This continued a recurring trend in teacher salaries over several decades where gradual declines are redressed following dispute, an inquiry, and the agreement of a significant salary increase (Forrester, 2003, p1013). Post-McCrone, there continued to be mixed messages about the nature of teacher professionalism. Professional learning primarily remained based on, or perceived as, attending 'courses' and professional learning to be seen as something provided for, and delivered to teachers (Purdon, 2003, p946). School-led professional learning promoted flexibility but nonetheless there were, and indeed still are, expectations that government priorities should be achieved. Within the McCrone agreement (SEED, 2001, Annex B) there was also an emphasis on teachers performing tasks, including undertaking professional learning, as directed by and with the agreement of the headteacher, calling into question the level of autonomy and agency expected of and available to teachers. However, McCrone also promoted collegiality implying a more transformative conception of professionalism, but as Macdonald (2004, p432) commented, a more radical change in policy was needed in order to create an environment in which Scottish teachers had the time and inclination to adopt a more activist approach required for such collegiality.

Donaldson, McCormac, and the GTCS Professional Standards and Professional Update

A decade or so after the McCrone Report the Scottish Government commissioned two inquiries which led to two influential reports, the Donaldson Report (Donaldson, 2010) into teacher education, and shortly afterwards the McCormac Report (McCormac, 2011) into teacher employment. Both had very significant implications for teacher professional learning. The remit given to Graham Donaldson, who had recently retired as Her Majesty's Senior Chief Inspector of Education, was "*To consider the best arrangements for the full continuum of teacher education in primary and secondary schools in Scotland. The Review should consider initial teacher education, induction and professional development and the interaction between them.*" (Donaldson, 2010, p106). Donaldson was seen by many as an 'insider' within Scottish education and in an unusual move was not the chair of an inquiry group but given sole responsibility to conduct the inquiry. Professor Gerry McCormac on the other hand had spent most of his working life outwith Scotland and was chair of an inquiry group. This group was tasked with reviewing the McCrone agreement with a remit "*to review*

the current arrangements for teacher employment in Scotland and make recommendations designed to secure improved educational outcomes for our children and young people" (McCormac, 2011, p60). This review was announced by Michael Russell, the Cabinet Secretary for Education, as part of the budget agreement reached between the Scottish Government and the Convention of Scottish Local Authorities (COSLA) which also included a pay freeze for teachers, changes to supply teachers' pay and conditions, a loss of salary conservation, and changes to probationers' conditions, all in the wake of the global financial crash of 2008 (Buie, 2011; Humes, 2013).

The Donaldson Report was a comprehensive review of teacher education across initial teacher education, early career, career-long and leadership phases. It contained fifty recommendations targeted across many stakeholders in Scottish teacher education. The Scottish Government accepted all fifty of the recommendations, the vast majority in full, but with a few in principle or in part (Scottish Government, 2011b), although it was the responsibility of many other organisations to implement and deliver many of these recommendations.

Donaldson has had a significant impact on shaping the nature of professional learning, making it clear that on completion of initial teacher education, teachers are not the finished article and require ongoing career-long professional learning. Donaldson was explicit in his report of his desire to enhance and reinvigorate the professionalism of teachers in Scotland (Donaldson, 2010, p10) but was not explicit in defining the nature of this professionalism only that it needed to be "*reconceptualised*" (Donaldson, 2010, p97). By not defining professionalism there is an implicit inference that the reader has a shared understanding of how the term is being used, but the language used by Donaldson sends mixed messages about the nature of the professionalism envisaged although a managerial conception tends to dominate.

In a Scottish Government commissioned evaluation of the impact of the implementation of the Donaldson Report (Black et al., 2016), conducted by a market research company, it was reported "*that there has been a significant shift in the culture of professional learning*" (p89) and according to the teacher self-reported data on which the evaluation was based that this shift was demonstrated in four key areas:

- Teachers are more engaged with professional learning.
- There is a greater focus on the impact of professional learning on pupils.
- Teachers are engaging in professional dialogue more often.
- Teachers show a greater willingness to try new approaches than five years previously.

However, this evaluation went on to report that "*there was widespread acknowledgement – across the teaching profession and among LA and national stakeholders – that there is a considerable way to go before the vision set out in TSF [Teaching Scotland's Future – the Donaldson Report] is fully realised*" (p91). Donaldson himself has stated only recently that much in his report remains to be implemented (Chapman & Donaldson, 2023, p9).

Following the Donaldson Report, the General Teaching Council for Scotland (GTCS) reviewed its standards and introduced a suite of revised professional standards for teachers. In addition to the Standard for Registration (GTCS, 2012d), a requirement to teach in Scotland, this included for the first time the Standard for Career-long Professional Learning (GTCS, 2012b). This standard emphasised the change in terminology from continuing professional development (CPD) to career-long professional learning (CLPL) in official documentation related to the professional learning of in-service teachers in Scotland, and with it the subtle change in messaging away from CPD which carried with it some historical baggage towards a greater emphasis on 'learning'. The Standard for CLPL was also different in nature to the Standard for Registration as it was aspirational rather than mandatory in nature and not something teachers were necessarily expected to 'achieve' (Kennedy, 2016). The suite of GTCS professional standards also included the Standard for Leadership and Management (GTCS, 2012c), aimed at those in both middle and senior leadership positions in schools. All the professional standards in this suite placed greater emphasis than previously on teacher leadership, professional enquiry, teachers using research and evidence-informed practices, and greater expectations of professional agency. They thus go beyond the traditional views and criticisms often levelled at competency standards (Watson & Fox, 2015, p134) which are characterised by a managerial conception of professionalism. The GTCS suite of professional standards includes aspects which are clearly more aligned with collaborative or transformative conceptions of professionalism. The GTCS revised the suite of professional standards once more in 2021 and these, and related documents, are analysed further in chapter 5.1.2.

The McCormac Report followed soon after the Donaldson Report, and Donaldson was also a member of the McCormac review group. The focus of this report was teachers' pay and conditions of service and it revisited many of the issues addressed by McCrone a decade earlier. On a surface level it followed on from McCrone and Donaldson and further endorsed the need for teachers to build knowledge and professional understanding over time through professional learning, although without going into any detail of what this might look like in practice. Likewise the report does not articulate explicitly what is meant by the term professionalism. Kennedy, Barlow and MacGregor (2012) used critical discourse analysis to investigate the use of the term professionalism in the McCormac Report and conclude it is overwhelmingly used in a managerial manner implying a deficit view of the current state of teacher professionalism. The report could be accused of promoting professionalism in a manner consistent with what Hargreaves and Goodson (1996, p20) describe as a "*rhetorical ruse – a way to get teachers to misrecognize their own exploitation and to comply willingly with increased intensification of their labour in the workplace*" or what Menter (2009, p221) describes as "*the deep irony of these processes of curtailing the independence and autonomy of teachers is that they are usually presented within a discourse of professionalization*". Kennedy, Barlow and MacGregor (2012) go as far as to suggest that rather than being entitled "*Advancing Professionalism in Teaching*" the McCormac Report would have been more appropriately entitled "*Teachers' Pay and Conditions: A Spending Review*" (p10). The McCormac report is an example of hegemony in action despite initial appearances.

The McCormac Report made numerous references to the recommendations of the Donaldson Report and endorsed many of them, such as "*Teachers should have access to relevant high quality CPD for their subject and other specialist responsibilities*" (Donaldson, 2010, p100; McCormac, 2011, p21). It also endorsed the GTCS's plan to introduce Professional Update (GTCS, n.d.-e), a professional reaccreditation scheme whereby teachers have to maintain an online professional learning log which is approved and 'signed-off' by the teacher's line-manager every five years. This went further than Donaldson's recommendation that teachers merely maintained an online profile of their professional learning (Donaldson, 2010, p99). The process of annual PRD, which had developed from the original appraisal processes introduced in the 1990s, plus the five yearly Professional Update further highlighted the entitlement of teachers to ongoing professional learning, but also raised issues around the capacity of the system to deliver appropriate professional learning, as well as the level of bureaucracy and accountability involved. Unlike in many countries, in

Scotland it is not required for PRD to be linked to a school professional learning plan (OECD, 2022, p391). This continues to allow a potential misalignment between a teacher's professional learning and the requirements of the school improvement plan in the teacher's school.

Addressing a recommendation of Donaldson (2010, p101), the Scottish College for Educational Leadership (SCEL) was set up to co-ordinate and deliver support programmes in teacher, middle, school and system leadership, although it was subsequently absorbed into Education Scotland (Education Scotland, n.d.-f). The OECD review of Scottish education also recommended that "*a coherent strategy for building teacher and leadership social capital*" be developed (OECD, 2015, p140; Hargreaves & Fullan, 2012, p90) and this has been a focus of the work of SCEL and its successor, which is consistent with promoting a more transformative conception of professionalism.

Curriculum for Excellence

Teacher professional learning policy and its development do not exist in a vacuum, and curriculum development has a very significant influence on the professional learning needs of teachers, as stated by Stenhouse "*curriculum development must rest on teacher development*" (1975, p24). The introduction of Curriculum for Excellence (CfE) aimed to reduce the specificity of the curriculum guidelines and devolved greater decision-making in curriculum content and structures to schools and teachers (Curriculum Review Group, 2004; OECD, 2015, p121).

The philosophy of CfE emphasised teachers as agents of change and co-creators of the curriculum, not something that had been a strong feature of the previous curriculum and implying a need for professional learning. Some had describing Scottish teachers as having been 'de-professionalised' and 'de-skilled' as a result of having been treated like technicians rather than professional educators (Gatherer, 2013, p979), something not unique to Scotland (OECD, 2017). Exhibiting a mixture of conceptions of professionalism, the philosophy of CfE promotes greater teacher autonomy (Scottish Government, 2008, 2011a; SNCT, 2007) at the same time as greater collaboration between teachers and with other partners, and a shift in culture regarding how teachers expect, and are expected, to account for their professional learning (Kennedy, 2013, p935). This inevitably raises questions about the nature of the

professional learning teachers require for the successful implementation of CfE, and how that is best provided during a time of financial austerity.

Despite widespread political and professional support for the principles of CfE, the path of its implementation has not been smooth (Drew, 2013; Priestley, 2018; Priestley & Minty, 2013) and has resulted in two independent reviews by the OECD (OECD, 2015, 2021) which are analysed more fully in chapter 5.1.5. At its outset CfE promised a radical change in curriculum and pedagogical approaches requiring significant teacher professional learning to enable such changes to be implemented and embedded in practice. In the years since, during times of relative austerity, there has been a lack of clarity of purpose, especially in the Senior Phase of CfE, which has inevitably impacted on the quality, quantity, and nature of the professional learning available and seen as desirable, both by teachers and education system leaders.

Following many years of continual curriculum and assessment changes, some would say 'fudges' (Murphy & Raffe, 2015, p155), ongoing concerns from many quarters (Learned Societies' Group on STEM Education, 2016, 2019; Scottish Government, 2016c; Scottish Parliament, 2018, 2019; SSTA, 2017), and a successful opposition motion in the Scottish Parliament, the second independent review by the OECD was announced (Scottish Government, 2019d). The Scottish Government accepted all the OECD's recommendations (Scottish Government, 2021b) and initiated a process leading to further reports (Campbell & Harris, 2023; Hayward, 2023; Muir, 2022). Whilst praising the general aspirational nature of CfE the OECD identified several issues preventing these aspirations being realised fully. It described education in Scotland as being highly politicised, and perhaps because of this, there being a policy environment lacking in coherence where roles and responsibilities for those throughout the system were not clear in relation to CfE. The OECD also highlighted the very high teacher contact hours in Scotland compared to other countries which reduce teachers' capacity to lead, plan, and support curriculum-making and the monitoring of student achievement (OECD, 2021, p97). This inevitably also compromises the ability to plan and implement teacher professional learning.

It would be hard to argue that the initial promise of CfE has been fully realised. It would also be hard to argue that there has been any significant change away from a culture of managerial professionalism towards one of transformative professionalism. The opportunities provided, and perhaps required, by the introduction of CfE, especially in

relation to the Senior Phase in secondary schools, has not been taken. The OECD's description of a "*busy system at risk of policy and institutional overload*" (OECD, 2021, p12) and a lack of policy coherence within the Scottish education system inevitably also applies to the professional learning of teachers. One of these many policy developments, first introduced in the year after the first OECD review of CfE, was the National Improvement Framework (Scottish Government, 2016b).

The National Improvement Framework

In theory, the National Improvement Framework (NIF) should assist with policy coherence by setting a small number of priorities for improvement, set within the broad vision of CfE, and its stated aim is to "*bring together an enhanced range of information and data at all levels of the system, to drive improvement for children and young people in early learning and childcare settings, schools, and colleges across the whole of* Scotland" (Scottish Government, 2019b, p6). McIlroy (2018), using an exclamation mark for emphasis, wrote "*A new National Improvement Framework was badly needed!*" (p626). He also noted that the OECD fingerprints were evident in its priorities. A draft version was published in September 2015 (Scottish Government, 2015), essentially for consultation, although the exact process and timescale for this was not made entirely clear (Learned Societies' Group on Scottish Science Education, 2015). A finalised version was published in January 2016 (Scottish Government, 2016b), and the first of a series of annual updates (Scottish Government, 2016a) was published in December 2016. These are analysed in chapter 5.1.4. From the outset, one of the six key drivers in the National Improvement Framework has been teacher professionalism.

Education Governance: Next Steps

Shortly after publishing the first National Improvement Framework, the Scottish Government published revised education governance proposals (Scottish Government, 2017a). The title of the document was telling, "*Education Governance: Next Steps, empowering our teachers, parents and communities to deliver excellence and equity for our children*". This is perhaps a prime example of what Bryce and Humes (2018a) describe as "*the rhetorical prose so prevalent in much of the documentation issued by central government and the agencies associated with it*" (p3).

This set out clearly the aim of trusting teachers as experts to shape the education they provide to young people (Scottish Government, 2017a); "*We will trust and invest in teachers and practitioners as empowered, skilled, confident, collaborative and networked* professionals" (p23). It also led to the development of a Headteachers' Charter (Scottish Government, 2019a, 2019b) which whilst emphasising the collaborative and collegiate nature of education nevertheless placed greater emphasis on headteachers' autonomous decision-making powers. Modelled on the already existing Northern Alliance collaboration between the local authorities in the north of the country which had come together to cooperate on solving common problems such as the recruitment of teachers to remote and rural areas (Seith & Hepburn, 2017), the governance proposals also included the setting up of six regional improvement collaboratives (RICs), umbrella bodies, each including several local authorities. The Convention of Scottish Local Authorities, understandably, saw these developments as a pincer attack on local authorities and that the introduction of RICs would diminish significantly local accountability for education in Scotland (Bryce & Humes, 2018a, p9). Others, such as Kier Bloomer, a former local authority chief executive, described the RICs as "*top-down, authoritarian, unwanted and hierarchical*" (Redford, 2018, p183), and would "*reinforce all the worst characteristics of the culture of Scottish education*" (Humes, Bryce, Gillies, & Kennedy, 2018, p975). Humes (1986) had previously commented on the centralising tendency of central government and the ineffectiveness of local government to either resist this trend or to really exercise effective local democracy in practice. He identified a situation where local councillors, lacking a good understanding of many of the issues involved, effectively hand over power to unelected officials who are more motivated with bureaucratic concerns than educational idealism. Humes goes on to state that "*these officials, in pursuing their own interests, do not hesitate to treat their subordinates – not least classroom teachers – in a manner that frequency seems arrogant and contemptuous*" (p107). Priestley has described the meso-level of educational governance, including local authorities and Education Scotland, to be risk averse in the face of accountability pressures resulting in incomplete engagement, strategic compliance and performativity (Priestley, 2018, p901). Whilst this may not be a scenario existing in all local authorities, it is clearly not a culture that promotes transformative professionalism.

It could be argued that the Scottish Government saw local government as a significant barrier to its policy implementation (McGinley, 2018, p187). The RICs also gave an opportunity for economies of scale and the potential to once again provide central support, advisory services,

and forms of networks and professional learning which had been lost in the break-up of the regional councils into smaller local authorities in 1996. Financial considerations continue to be a significant policy driver. However, local authorities, despite the variety of their modes of operation in different parts of the country, had generally received good inspection reports from Her Majesty's Inspectorate of Education (HMIe) and been seen as "*positive forces for improvement*" in Scottish education (McIlroy, 2018, p635). Therefore moves to diminish their role, along with a strengthened role for the national support agency, Education Scotland, were generally seen as "*surprising*" (Humes & Bryce, 2018, p120).

Consultation responses to these proposed education governance reforms were mixed at best and frequently sought greater clarity in the proposals, as exemplified by the statements made by Scotland's national academy, the Royal Society of Edinburgh (2017, 2018a, 2018b). The independent research organisation tasked by the Scottish Government to collate the responses summarised the overall response as: "*In general, there was support for the principles behind the Education (Scotland) Bill although there was less support for legislation to enshrine these principles*" (Why Research, 2018, p1). Rather than the legislation being passed by parliament and enacted, the Scottish Government was forced to roll-back its proposals and a consensus agreement was reached between central government, its agencies and local authorities (Joint Steering Group, 2017; Scottish Government, 2018b). This agreement, perhaps demonstrating the hegemony of the Scottish education leadership class, tempered the proposals but nevertheless resulted in the setting up of six RICs encompassing the 32 local authorities and the development of the Headteachers' Charter but not the introduction of an Educational Workforce Council for Scotland to cover a wider range of education employees than that of the General Teaching Council for Scotland. McIlroy (2018, p635) saw the governance review as an opportunity missed, and whilst its aspirations were worthwhile the focus on structures took away from a focus on changing culture and on teaching and learning. Many advocate that the fundamental problems with Scottish education are cultural rather than structural (Humes, Bryce, Gillies, & Kennedy, 2018, p975; Kennedy, 2008, p841), and as in the often quoted statement, allegedly made famous by Peter Drucker, "*culture will eat strategy for breakfast*". The culture of Scottish education has deep seated roots which have encouraged teachers to be compliant and conformist in the face of the imposition of top-down policy (Bhattacharya, 2021; Humes, 1986).

Despite politicians' rhetoric of teacher and school empowerment and developing teachers as enquirers, many teachers have not been used to exercising their autonomy, demonstrating agency, or engaging in independent critical thinking about important educational issues. That the subtitle of the Scottish Government's governance review was "*empowering our teachers, parents and communities to deliver excellence and equity for our childre*n" (Scottish Government, 2017a) does raise the questions of why teachers have been disempowered, and by whom, as well as what is required to fully empower them in practice. If they are to now be empowered, and the phrase is to be more than empty rhetoric, then Sachs's trust, active trust and generative politics (Sachs, 2003b) must be allowed to develop through an improved culture of trust in teachers from politicians and system leaders. If teachers are to be able to attain any form of transformative professionalism which will have a truly transformative impact on both teachers' individual professional growth, and on the performance of the education system as a whole, it will only be through such changes in governance culture.

In addition to teacher professionalism, school leadership was, and continues to be, also identified as one of the six drivers for improvement in the NIF (Scottish Government, 2016b). The emphasis on leadership has been a strong theme through the Scottish educational discourse of the 21st Century, and has been shown to be a significant factor both in school improvement and effective professional learning (Robinson et al., 2009), so this is further explored next.

Teacher Leadership

The increased focus on business models of management in education since the 1990s has increased the emphasis on strong and effective leadership as a major plank of educational improvement, remaining so in the NIF. School leadership was, and continues to be, the first of the six drivers listed (Scottish Government, 2016b, p10; 2021a, p25). Gillies (2018a, p94) argues that placing such an emphasis on leadership as the solution to educational improvement can involve an overly mechanistic and formulaic approach to what are actually complex social and relational problems. Traditionally the term 'leadership' has been associated with the hierarchical promoted post structures in schools, and the education system more widely. Partly due to the work of the Scottish College for Educational Leadership, and its successor (Education Scotland, 2020b; Kelly, 2016), but also developments internationally (Frost, 2014; Harris & Muijs, 2005; Lieberman et al., 2017;

Lovett, 2018), an increasing emphasis is now being placed on teacher leadership within Scottish education in addition to the more traditionally understood middle, senior and system leaderships. Teacher leadership cuts across the traditional leadership hierarchies in schools and there are questions over whether teacher leadership does indeed add anything to the transformative professionalism expected of all teachers, and with which there is significant overlap. There is confusion around the concept of teacher leadership and Wenner and Campbell (2017), in a review of teacher leadership literature, describe it as "*conceptually ill defined*" and there is an unhelpful "*muddiness*" (p157) around the use of the term in both the research literature and its enactment in practice. In a meta-analysis investigating the association between teacher leadership and student achievement Shen et al. (2020) found that teacher leadership activities facilitating improvements in curriculum, instruction and assessment were those most strongly associated with improvements in student achievement. It would appear this merely confirms that professional learning activities focused on improving the instructional core of the classroom are the most effective at improving student outcomes rather than wider leadership activities.

In a national engagement exercise and survey on teacher leadership undertaken with over 1000 teachers across Scotland, Kelly (2016, p27) concluded "*a cultural change in Scottish education is required to ensure that teacher professionalism and autonomy is equitably valued and nurtured across the system*". It appears that power relationships and hierarchy may still too often stifle the enactment of teacher leadership, and too few teachers in Scotland may yet identify sufficiently as teacher leaders for there to be a widespread culture of acceptance of teacher leadership, despite the prominence it has been given in policy to promote both bottom-up workforce reform and school improvement (Torrance & Humes, 2015). At the time of the McCormac report the chartered teacher scheme in Scotland was terminated, largely due to the tensions between its particular conception of individual autonomy and teacher professionalism and school and system leaders' desire for accountability, evidence of impact, and need to allocate specific leadership duties to the post holders (McMahon, 2018, p863). Torrance and Murphy (2017), following a study based on 45 teachers undertaking masters-level leadership study at a Scottish university, state that:

> "*Tensions between differing conceptualisations of teacher leadership, and its relationship to formal management hierarchies, run through both the literature and the experiences reported in this Scottish study. In the absence of a clear, coherent*

Scottish account of the concept and consequent practice implications of teacher leadership, the complicated interactions between formal and informal leadership expectations will continue to cause tensions in the relationships and practices of individual school communities." (p41)

Although progress may have been made, it appears there is some way to go to achieve a culture which promotes effective teacher leadership, and/or transformative professionalism, consistently across Scotland's schools. Tensions in the conceptualisation of leadership can also manifest themselves in how teachers are involved in the policymaking process, and this is explored in concluding this chapter.

The involvement of teachers in policymaking

The research of Kraft and Papay (2014) and Kini and Podolsky (2016) show that when teachers feel that they are working in a supportive environment in which they can demonstrate agency through having both good levels of autonomy whilst belonging to a collegiate culture, this increases their job satisfaction, desire to remain in post, and importantly improves pupil outcomes. Others might describe such an environment as one which promotes transformative professionalism, and one which leads to system improvement. Even if there are opportunities for the teacher voice, if the prevailing culture is one of top-down power hierarchies, teachers may be wary of speaking truth to power, and there are indications of this being the case in Scottish education, exacerbated by restrictions on engagement in policy discussion in teachers' employment contracts (Murphy & Raffe, 2015, p154). The lack of a teacher voice in educational policymaking, and time for teachers to make meaning out of policy change, as a barrier to enacting change has been well recognised for some time (Fullan, 1991, p112). In recent years in Scottish secondary schools there is ample evidence that many teachers have felt that their voices have not been heard during the policymaking and policy-enacting phases for significant issues such as CfE, Senior Phase curriculum architecture, Scottish Qualification Authority (SQA) assessment design, and related workload issues. This has included responses to surveys by professional associations (EIS, 2013, 2014; SSTA, 2019a), in submissions to the inquiries of the Scottish Parliament Education and Skills Committee (Scottish Parliament, n.d.), in the GTCS review of the first five years of Professional Update (GTCS, 2020), and in the National Discussion on Education (Campbell & Harris, 2023). Gillies (2018b, p109), with the benefit of hindsight, provides a

quite pointed critique of the somewhat chequered enactment of what is arguably the most significant Scottish educational policy of the last two decades, CfE, particularly in secondary schools. He points the finger at the lack of involvement and engagement of teachers at all stages as the root cause. In the words of Bryce and Humes (2018b) "*tensions ... can exist between officialdom and classroom teachers when changes are being introduced*" (p52), and they ask that in the future in Scotland "*their [teachers'] voices need to be heard, not as a token gesture during carefully managed 'consultation' exercises, but as a regular part of their professional work, contributing to the evolution and improvement of the system as a whole*" (p54). A similar call is made by Kennedy and Beck in relation to teacher professional learning in Scotland. They ask that "*this should not be a discussion which exists only among senior policymakers, it must include teachers and the wider education community in talking together about what constitutes valuable and worthwhile professional learning, and how we might best account for our actions in this sphere*" (Kennedy & Beck, 2018, p856).

In the future, one would hope that teachers will have an appropriate voice in policymaking, not just at the micro-level of Scottish education, but also at the meso-level and macro-level. However, even within the constraints of the current system it is possible to give teachers a voice and promote teacher agency, not only in their classroom practice, but in their professional learning, and in school improvement. Gilchrist (2018) has described how a focus on teacher professional learning, and on using practitioner enquiry, resulted in school improvement in primary schools in the Scottish Borders. More recently, Robertson (2020) describes how a systematic and consistent focus on individual and collegiate professional learning within a Scottish secondary school with an emphasis on improving teaching and learning has not only improved the professional learning culture in the school but resulted in very significant school improvement. It is a very clear statement that if professional learning is focused on the needs of individual teachers, but in a shared collegiate manner with a strong focus on teaching and learning, drawing on an appropriate range of knowledgeable others and external stimuli, then school and system improvement will look after themselves. The excellent progress made in the school was recognised with an Excellence in Professional Learning award from the GTCS (Eyemouth High School, 2019).

In many ways these two examples are just good exemplars of what was recommended in the OECD review of Scottish education with "*a bolder approach, driven by a focus on teaching and learning rather than simply system management*" (Bryce & Humes, 2018b, p50). They

are also exemplars of what could be considered fit-for-purpose professional learning, of benefit to individuals, schools, and the system as a whole, as well as for the education of young people which is the ultimate purpose.

2.4 Summary

It appears that, thanks to the ‘lad o’ pairts’ Scottish educational ‘myth’, early legislation, and the general value placed upon education in Scotland, throughout the 20th Century Scottish teachers fitted well with the traditional conception of professionalism. However, the introduction of a more business-like approach to educational management in the 1980s and 1990s, with increased target setting and accountability measures, led to the rise of a managerial conception of professionalism that largely remains to this day. In the 21st Century, much of the rhetoric and some of the developments have promoted a transformative conception of professionalism with an increased collaborative element, although this is still very much mixed in with accountability measures promoting performativity and a managerial conception of professionalism. There is therefore still some way to go before it can be said that the teaching profession in Scotland exhibits a transformative conception of professionalism, and as well as the political will required, there is a significant need for appropriate professional learning to facilitate the necessary culture change. In the next chapter professional learning and professional growth are explored in more detail.

Chapter 3 Review of literature on professional learning

In this chapter the professional learning literature is explored, first the importance of teacher professional learning before a discussion of theoretical frameworks and models for the processes of professional learning and of professional growth. It concludes with a review of factors which impact on professional learning practice.

3.1 The case for professional learning

High quality teaching has an impact on the learning of children and young people (Sutton Trust, 2011) and professional learning can have an impact on the effectiveness of teachers (Cordingley et al., 2015, 2018). This is summed up well by Rauch and Coe (2019):

> "*The quality of teaching is arguably the single most important thing that teachers and school leaders can focus on to make a difference in children's learning. The difference between really good teaching and less effective teaching makes more difference to learning than any other factor within school. High-quality teaching narrows the advantage gap. Crucially, it is also something that can be changed: all teachers can learn to be better*." (p10)

Individual teachers invariably want to do well by the learners they teach, and education system leaders and educational reformers want to see improvements in education as a whole (Barber & Mourshed, 2007; Mourshed et al., 2010; OECD, n.d.). There is therefore a strong rationale for ensuring that teacher professional learning is used to improve valued educational outcomes. However, this immediately raises questions as to what these valued outcomes might be, whether there is any consensus as to what they might be, who decides what these outcomes ought to be, what ought to be the means of achieving these outcomes, and whether we would recognise reliably if they had been achieved.

Some have stated that new teachers perform as well as more experienced colleagues (Gore et al., 2023), however, the rubric upon which this assessment is based is not without its critics (Ashman, 2023), and even if that is the case, all teachers could still improve their practice. Few argue that a new entrant to the secondary teaching profession with a degree in a subject discipline and an initial teacher education (ITE) qualification will be an expert teacher. It has been shown that it can take many years for expertise to develop (Berliner, 2004; Furlong &

Maynard, 1995). Berliner (2004) describes a model of teacher professional growth consisting of five stages of development: novice, advanced beginner, competent, proficient, and expert. Berliner (2004, p201) estimates that it typically takes around seven years of teaching experience for a teacher to reach the proficient stage. Whether or not a teacher then goes on to become an expert and to demonstrate a high level of adaptive expertise is not assured and this is likely to be significantly influenced by ongoing professional learning. This is supported by Kraft and Papay (2014) where, for mathematics teachers, it is shown that the impact of a typical teacher on their pupils' achievement increases rapidly during the first three years of their career and then more slowly thereafter. This demonstrates that teachers show a significant professional growth in their first few years in their career. However, the professional environment of a teacher has a significant impact on the rate of professional growth of that teacher, see figure 4.

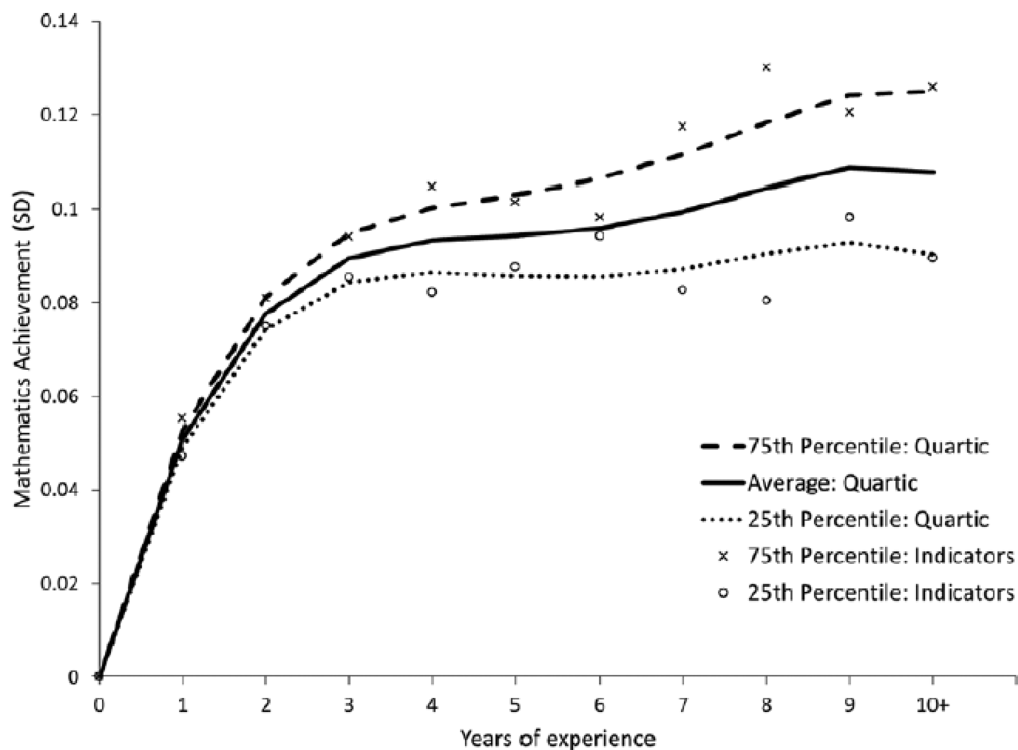


Figure 4: Estimated average returns to teaching experience and how this is affected by the supportiveness a teacher's professional environment (Kraft & Papay, 2014, p489)

The rate of improvement in supportive professional environments is greater but also improvement is sustained, albeit at a lower rate than in previous years, rather than plateauing after around four years teaching experience as appears to be the case in less

supportive professional environments. The recent availability of longitudinal studies tracking teachers through their careers, rather than ones comparing different generations of teachers, has shown the assumption that teachers do not improve after their first few years of their careers does not appear to be true, provided the professional learning environment of teachers is a supportive one (Podolsky, Kini, & Darling-Hammond, 2019, pp303-4). There is of course great variability within the teaching profession, as summed up by Podolsky, Kini and Darling-Hammond (2019):

> "*Of course, not all experience is educative: some highly experienced teachers are not particularly effective or have retired on the job, and some novice teachers are dynamic and effective. However, by and large, a more experienced teaching workforce offers numerous benefits to students and schools.*" (p304)

The compounded effect of having a series of experienced teachers demonstrating adaptive expertise for several years in a row has been shown to have a significant impact on pupil achievement (Clotfelter et al., 2010; Huang & Moon, 2009; Kraft & Papay, 2014; Ronfeldt et al., 2011; Wiswall, 2013). Many of the well-evaluated professional learning programmes have been shown to have positive impacts on participants' teaching and their pupils' achievements (Basma & Savage, 2018, 2023; Cobb et al., 2018; Gonzalez et al., 2022; Kraft et al., 2018; Lynch et al., 2019) but there is evidence that such programmes are not typical of the professional learning experiences of the majority of teachers which result in much smaller, or even negative, impacts (Kirsten et al., 2023). This may be because the quality of professional learning is difficult to scale beyond small-scale programmes or the wider education profession does not have the expertise in leading and facilitating the forms of professional learning found in the well-evaluated programmes.

Therefore, a challenge for the education system is to make sure quality professional learning and supportive professional learning environments are readily available to ensure career-long improvement and an increased likelihood that teachers will progress to developing adaptive expertise. However, what does a supportive professional learning environment look like?

3.2 Theorising professional learning

There have been many attempts to theorise teacher professional learning. Various authors have approached the problem from different perspectives and produced models for different purposes. Some theorise the purposes or outcomes of the professional learning, others the design or modes of professional learning, and others theorise the process of professional learning to give an understanding of how professional growth in teachers occurs. These different approaches are discussed below.

3.2.1 Fit-for-purpose professional learning

If professional learning is to be fit-for-purpose this immediately raises the questions of 'what purpose?', and 'who decides on that purpose?'. As teachers progress through their careers their professional learning needs are likely to change. Due to the complex nature of education, as Guskey (2000) describes, no single 'recipe' for professional learning works for all teachers, in all situations, or for all possible purposes. Guskey also states that the purpose of any teacher professional learning should be improving pupil outcomes; "*The most effective professional learning planning begins with clear specification of the student learning outcomes to be achieved and the sources of data that best reflect those outcomes*." (Guskey, 2016, p37). He states that, only by identifying the desired pupil outcomes should the type of professional learning, and the nature of evaluation data gathered to determine its effectiveness, then be decided. Guskey also proposes five levels for the evaluation of professional learning:

Level 1: Participants' Reactions

Level 2: Participants' Learning

Level 3: Organizational Support and Change

Level 4: Participants' Use of New Knowledge and Skills

Level 5: Student Learning Outcomes (Guskey, 2000)

Although Bubb and Earley (2010) and King (2014) have evolved Guskey's evaluation framework into more extensive and nuanced versions his five levels retain a pragmatic efficiency. Evaluation at level 5 requires data which is significantly removed from the occurrence of any teacher professional learning and, given the complexity of education, the

confident determination of causal links between professional learning activities and pupil outcomes is likely to be difficult. Nevertheless, chapter 3.1 sets out that there is a link between effective professional learning and improved pupil outcomes. Recognising the complexity, Evans (2014, p188) argues that it is only worthwhile to consider the impact of professional learning in relation to teachers rather than on pupil outcomes. Due to the additional complexity and ethical issues which would be involved, this study focuses on better understanding what makes professional learning effective from the perspectives of teachers and leaders and draws on data across Guskey's levels 1 to 4 but does not draw on data from pupils.

Sachs (2011) identifies four purposes of professional learning: retooling (new skills for teachers); remodelling (changing teaching approaches); revitalising (motivating and refreshing teachers), and reimagining (transformative changes in practices), all referring to teacher rather than pupil outcomes. Harland and Kinder (1997), in analysing data from an in-depth, longitudinal study of the science professional learning of primary teachers, identified nine different categories of outcomes for professional learning, and suggested organising these in a hierarchy of impact, see figure 5.

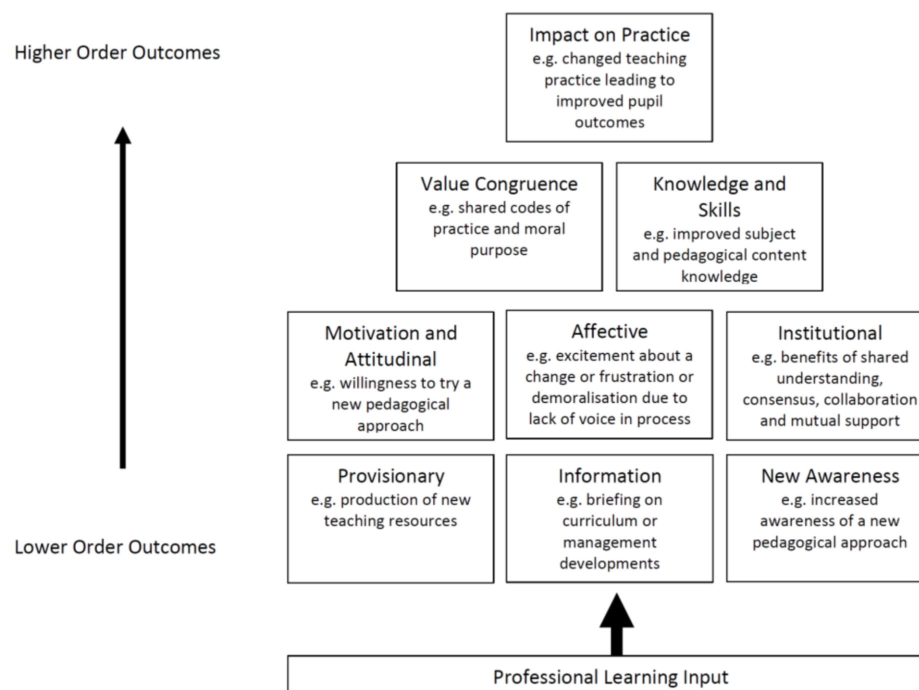


Figure 5: A hierarchy of professional learning outcomes, adapted from Harland and Kinder (1997, pp 76-7)

Like Sachs, they stopped short of including improvement in pupil outcomes in this classification and state that the "*ultimate intention*" of professional learning is changed classroom behaviours of teachers, or "*impact on practice*", nevertheless behaviours that are presumably intended to improve pupil outcomes. Harland and Kinder (1997, p76) liken this to Fullan's concept of "*change in practice*" (Fullan, 1991), and for this to occur it is likely that most, or all, of the lower order outcomes need to be present, either as pre-existing conditions or provided as part of the professional learning. They argue that both 'value congruence' and 'knowledge and skills' are required, and that both may themselves depend on the presence of some of the lower order outcomes. It seems reasonable, given the complexity of teacher professional learning, that significant elements of the lower order outcomes must be in place if the higher order outcomes are to be achieved.

This all highlights that the purpose of the professional learning must be clear before deciding on a mode of delivery, for although there are links between teacher professional learning, pupil outcomes, and school and system improvement these are not automatic (King, 2014, p107). However, it is likely that the desire to improve pupil outcomes, both through an improved education system as well as through improved professional practices of individual teachers, will apply across discussions associated with teacher professional learning.

3.2.2 Modes of teacher professional learning

Guskey's work is firmly based in evaluating the effectiveness of professional learning and helping teachers, teacher leaders, and teacher educators identify and deliver better fit-for-purpose professional learning. He states: "*Simply doing more of the same old stuff, however, is not necessarily better. It can actually lead to diminished results, higher levels of frustration, and increased cynicism*" (Guskey, 1999, p11). Guskey (2000, p22) identifies seven major models of professional learning and goes on to discuss their advantages and shortcomings and through this begins to identify the sorts of purposes to which each of these models might best be suited. These major models are:

1. training
2. observation/assessment
3. involvement in a development/improvement process
4. study groups
5. inquiry/action research

6. individually guided activities
7. mentoring.

Although Guskey refers to these as 'models' of professional learning they might better be describes as 'modes' of professional learning. He describes them as differing in the assumptions, expectations and beliefs they make about professional growth, the implicit and explicit demands they make on the individuals undertaking them, and how they are then likely to impact on both the improvement of the individual and the wider profession (Guskey, 2000, pp28-9). Due to these differences Guskey advocates that there is no single mode of professional learning appropriate for all circumstances and that an effective professional learning plan will be based on several of these modes depending on the purposes of the professional learning. He then states that such a blended programme can therefore result in professional growth and improvement at both the individual and organisational levels. In my view, it is logical that a blended approach is much more likely to ensure the professional learning needs of a greater range of participants are met, at least to some extent, than any one single mode.

A similar approach is taken by Kennedy (2005, 2014). In 2005 Kennedy identified nine key models which she classified in relation to their support for professional authonomy and transformative practice. These nine models are:

1. training
2. award-bearing
3. deficit
4. cascade
5. standards-based
6. coaching/mentoring
7. community of practice
8. action research
9. transformative.

The main characteristics of each of these models were identified along with the circumstances in which each of the models might be adopted and used. The analysis of the models led to them being arranged in a spectrum or hierarchy from those having the purpose of transmission of knowledge through more fluid transitional models to those resulting in

transformative professional growth in teachers and a significant increase in the capacity for professional autonomy.

In revisiting this topic in 2014, Kennedy revised her classification of models to:

1. training
2. deficit
3. cascade
4. award-bearing
5. standards-based
6. coaching/mentoring
7. community of practice
8. collaborative professional enquiry.

In this revision Kennedy made three significant changes to her classification. First, she relabelled the spectrum of the purpose of the models of professional learning as transmissive, malleable, and transformative with the spectrum representing an increasing capacity for both professional autonomy, as before, but also of teacher agency. The redefining of transitional as malleable better represents the more fluid and often flexible nature and purpose of professional learning, especially in the middle part of the spectrum. Kennedy refers to her classification as a spectrum but the listing and diagramatical representations are always shown as a vertical list, with a directional arrow showing an increasing capacity of the professional learning to deliver professional autonomy and teacher agency, see figure 6. This implies, perhaps not intentionally or explicitly but certainly implicitly, a hierarchy in the desireability and impact of professional learning further strengthened by the use of descriptive terms such as transmissive, training, and deficit at one end to transformative and enquiry at the other end. This is not to say that more transmissive models of professional learning do not have their place, or do not lead to some professional growth in its participants. For example, during the early stages of the COVID-19 pandemic many teachers benefited from relatively transmissive professional learning of a training or deficit model on the use of digital tools. This professional learning resulted in the teachers gaining new knowledge and skills, and quite possibly altering their beliefs of what is possible, and in doing this may have prompted transformative changes in their support for pupils and

Purpose of Model	**Examples of models of CPD which may fit within this category**
Transmissive	Training models Deficit models Cascade models
Malleable	Award-bearing models Standards-based models Coaching/mentoring models Community of practice models
Transformative	Collaborative professional inquiry models

Increasing capacity for professional autonomy and teacher agency

Figure 6: Spectrum of CPD [professional learning] models (adapted [from Kennedy, 2005]) (Kennedy, 2014, p693)

their pupils' learning outcomes. This raises questions regarding the purpose of any given professional learning activity and whether some models of professional learning should be priviledged or promoted over others as well the role of teacher agency which is discussed further in chapter 3.3.

Second, Kennedy moved the award-bearing professional learning from being classified as transmissive to that of being malleable which exemplifies the flexibility required for this model. For example, award-bearing professional learning can vary from being short transmissive certificated professional learning sessions to transformative masters and doctoral studies.

Third, Kennedy redescribed the action research and transformative models as collaborative professional enquiry models as a catch-all term for the various forms of collaborative professional learning experiences which can be described as, or include aspects of, practitioner enquiry, action research, lesson study, instructional rounds, professional learning communities, and networked learning communities which can lead to transformative professional growth of individuals and organisations. Kennedy describes these as "*more of an orientation to professional learning than a specific CPD model*" (Kennedy, 2014, p693). This is consistent with Cochran-Smith and Lytle's (1999) concept of 'enquiry as stance' and Groundwater-Smith and Mockler's (2010) advocacy for enquiry-based professional learning as a means of increasing teachers' courage to challenge a compliance

agenda. It is therefore inappropriate to consider 'enquiry' as a particular mode of professional learning delivery but rather as a way of thinking about the process of professional learning. Taking an enquiry as stance approach allows those involved to draw upon a wide range of fit-for-purpose professional learning activities and modes, as is appropriate to address the issues at hand, but within a broad enquiry cycle structure.

Kennedy's revised classification of transmissive, malleable, and transformative, in my view, better represents the complexity of teacher professional learning in practice than her previous wording and I consider the concept of a spectrum of professional learning from transmissive to transformative to be very useful. However, the classification still implies there are distinct models of professional learning whereas in practice particular professional learning activities may be more complex and have features which fit within more than one category, such as collaborative enquiry which leads to an award or mentoring designed to address a deficit. Kennedy and colleagues, in seeking to understand this complexity, proposed a "*triple-lens framework*" for analysing and evaluating professional learning policy, practice and impact (Fraser et al., 2007, p161). This draws on three different approaches to understanding professional learning: Bell and Gilbert's (1996) aspects of professional learning, see figure 13, Kennedy's framework discussed above, and Reid's quadrants of teacher learning. The use of this triple-lens framework emphasises that the different approaches seek to understand different aspects of professional learning and have different assumptions and purposes. An additional approach is to consider the features that effective professional learning exhibits and it is to this I now turn.

3.2.3 Features of effective professional learning

Ingvarson (2019, p16) stated "*there is no shortage of knowledge about the characteristics of effective professional learning activities*". Although it has critics (Fletcher-Wood & Sims, 2018; Sims & Fletcher-Wood, 2020) as discussed in chapter 3.6.1, there is a general research consensus regarding the features of professional learning which sits at the transformative end of Kennedy's spectrum. Transformative professional learning is likely to have the greatest impact on teacher professional growth and pupil outcomes (Campbell, 2019; Darling-Hammond et al., 2017; Desimone, 2009; Garet et al., 2001; Kennedy, 2016) and is summarised well by the ten principles for professional learning identified by Timperley (2008), see table 1.

	Principle	Description
1	Focus on valued student outcomes	Professional learning experiences that focus on the links between teaching activities and valued student outcomes are associated with positive impacts on those outcomes.
2	Worthwhile content	The knowledge and skills developed are those that have been established as effective in achieving valued student outcomes.
3	Integration of knowledge and skills	The integration of essential teacher knowledge and skills promotes deep teacher learning and effective changes in practice.
4	Assessment for professional inquiry	Information about what students need to know and do is used to identify what teachers need to know and do.
5	Multiple opportunities to learn and apply information	To make significant changes to their practice, teachers need multiple opportunities to learn new information and understand its implications for practice. Furthermore, they need to encounter these opportunities in environments that offer both trust and challenge.
6	Approaches responsive to learning processes	The promotion of professional learning requires different approaches depending on whether or not new ideas are consistent with the assumptions that currently underpin practice.
7	Opportunities to process new learning with others	Collegial interaction that is focused on student outcomes can help teachers integrate new learning into existing practice.
8	Knowledgeable expertise	Expertise external to the group of participating teachers is necessary to challenge existing assumptions and develop the kinds of new knowledge and skills associated with positive outcomes for students
9	Active leadership	Designated educational leaders have a key role in developing expectations for improved student outcomes and organising and promoting engagement in professional learning opportunities.
10	Maintaining momentum	Sustained improvement in student outcomes requires that teachers have sound theoretical knowledge, evidence informed inquiry skills, and supportive organizational conditions.

Table 1: Timperley's ten principles for professional learning (Timperley, 2008)

Timperley's ten principles do not operate independently; rather, they are integrated to inform cycles of learning and action, such as those described by Korthagen and Kessels (1999, p13), Timperley et al. (2007, pxliii), and Donohoo and Velasco (2016, p6). Timperley (2008, p6) also identified four important understandings that arise from the evidence base:

1. Student learning is strongly influenced by what and how teachers teach.
2. Teaching is a complex activity.
3. It is important to set up conditions that are responsive to the ways in which teachers learn.
4. Professional learning is strongly shaped by the context in which the teacher practises.

The study of Timperley et al. (2007) has been included and referred to in several subsequent reviews of professional learning literature and is regarded as being highly detailed, rigorous, robust, and based on a large scale sample (Cordingley et al., 2015, p4). It can be seen from Timperley's principles that such professional learning must be embedded in the context of the teacher, integrate new and worthwhile subject knowledge with pedagogical knowledge, have input from knowledgeable others (KO) to ensure professional growth occurs rather than the "*sharing of ignorance*" (Guskey 1999, p12), be truly collaborative rather than display "*contrived collegiality*" (Hargreaves & Dawe, 1990), be sustained, and be focused on valued pupil outcomes.

Campbell (2019, p68) comes to similar conclusions identifying ten features of effective professional learning grouped in three categories. In summary, her description of effective professional learning is that it:

1. Has *quality content*

    - which is evidence-informed,
    - includes attention to subject-specific and pedagogical content knowledge,
    - focuses on student outcomes, and
    - which considers a balance between teacher voice and system coherence in priority content.

2. Pays careful attention to *learning design and implementation* approaches

    - that include a range of opportunities for active and varied CPD,
    - involves collaborative learning experiences, and
    - is job-embedded learning.

3. Ensures attention to adequate *support and sustainability* from the outset,

    - including sufficient time and duration of CPD,
    - adequate availability of resources, and
    - has supportive and engaged leadership in schools and at the system level.

In a comparison and analysis of nine reviews of professional learning, four general educational reviews (Cordingley et al., 2015; Darling-Hammond et al., 2017; Kennedy, 2016;

Maandag, Helms-Lorenz, Lugthart, Verkade, & Van Veen, 2017), three specific educational reviews (Basma & Savage, 2018; Kraft et al., 2018; Popova et al., 2018), and two non-education reviews (Cowpe et al., 2019; Salas et al., 2012), Weston and Hindley (2019) identified features that were consistently identified across the reviews:

- Professional learning should be iterative, with opportunities to apply learning in real practice, reflect and improve over time.
- Professional learners should see the relevance of the training to their job requirements and to their professional goals and aspirations.
- Professional learning should be designed with a focus on impact on students, with formative assessment built in for participants.
- Organisational leaders and facilitators need to create and protect the conditions for learning, e.g., time and space, while identifying and removing barriers such as workload.
- Organisational leaders should demonstrate and encourage alignment between professional learning and wider goals/approaches, actively encouraging and supporting the buy-in of participants.

They also identify features identified in most reviews but questioned or challenged by one of the reviews in each case:

- Professional learners should engage in structured collaborative learning focused on problem-solving and enquiry.
- Professional learning is more effective when it has either an explicit focus on a specific subject area or where there are opportunities to translate generic ideas into a subject-specific context.
- Professional learning should be facilitated through coaching and mentoring, with opportunities for explicit modelling of skills (including live, video, and written case studies), giving feedback on efforts.
- Professional learning facilitators and coaches should be experts in both the content and process of the professional learning, challenging internal orthodoxies, and providing new perspectives where necessary.
- Professional learning is more effective when teachers are volunteers in the process rather than being conscripts.

Weston and Hindley's (2019) analysis identified that how sustained the professional learning ought to be is a contentious issue questioned in more than one of the nine reviews considered. Indeed, Kennedy (2016) fails to find a robust relationship between programme intensity and outcomes, with Kraft et al. (2018) suggesting that the quality of interactions, rather than quantity, is of more importance. Basma and Savage's (2018) review tentatively suggests that shorter professional learning interventions appeared to have more impact, although this may have been due to shorter studies having higher methodological quality and sample size.

Short, unconnected, one-off professional learning sessions are the staple for many teachers (Darling-Hammond et al., 2009, p9; Gilchrist, 2018, p69; Hoban, 2002, p2; Yoon et al., 2007, p1). At least some of these are likely to be designed for training or deficit purposes consistent with the transmissive end of Kennedy's spectrum of professional learning. Whilst such professional learning, designed to address a clearly identified deficit as described by Farmer (2021a, 2021b), may not result in systemic education reform or culture change, or even professional growth of the individual, it may still be fit-for-purpose and fulfil a specific need, albeit perhaps one of the lower order outcomes described by Harland and Kinder (1997). Hargreaves and Fullan (2012) refer to a deficit model when describing a 'business capital' approach to professional learning which they argue leads to a loss of teacher agency and a culture of compliance which ultimately stifles both the professional growth of individual teachers as well as the development of the wider education system. Sachs (2016) also argues that accountability regimes lead to a culture of compliance. Whilst not indicating transmissive forms of professional learning will lead to a loss of agency, Kennedy certainly indicates these are the least likely to build either professional autonomy and/or teacher agency. Transmissive forms of professional learning therefore have their place, but they should not dominate. However, Hoban (2002) states that much of the professional learning experienced by teachers is of a transmissive, one-off nature and is due to many of the stakeholders in the educational community, including teachers, teacher leaders, administrators and policy-makers, underestimating the difficulty changing classroom practice. He attributes this to many having a simplistic, linear, mechanistic view of educational change and them not appreciating the true complexity of the educational system or classroom context, in part at least due to them only ever having experienced this form of professional learning and therefore being unaware of alternative forms of professional learning or how to implement them. Ethnographic studies of organisations by Brown and

Duguid (1991) showed that they frequently operate in ways different to those laid out in policies and manuals. They also found that professional learning was often characterised as operating in a simplistic, linear manner, see figure 7.

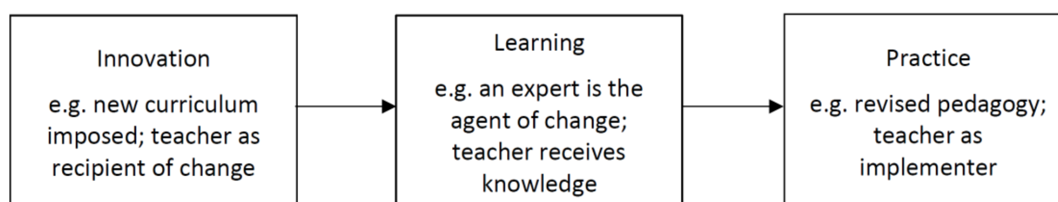


Figure 7: Traditional model of professional learning (Brown & Duguid, 1996)

Moore and Shaw (2000) found that one-off professional learning experiences, often presented by 'external experts' from the meso-level of the education system or beyond, were presumed to lead to improvement in the manner described in figure 7 and were the most common experience of teachers. Although one-off professional learning can lead to some learning they may consolidate existing practices rather than lead to significant change in either the organisation or the individual teachers (Hoban, 2002, p39). The models discussed above describe and categorise the purposes and outcomes of professional learning, but the professional learning process of figure 7 is inappropriately simplistic, if not plain wrong. In the next section a separate group of models describing the processes of teacher professional growth is explored.

3.2.4 Models of teacher professional growth

There is an extensive literature on the processes of teacher learning that result in teacher professional growth, all of which recognise the greater complexity of the process compared to the simplistic model of figure 7. I have selected from the literature several which I consider shine some useful light on the inherently complex process of professional growth and I discuss these in turn.

Guskey (1986, 2002) described a simple unidirectional linear path model, see figure 8, the central tenet of which is at odds with the traditional model of figure 7. Guskey's model still implies a simplistic cause and effect relationship between the different stages, but improved student outcomes are seen to occur before the teacher changes their beliefs and attitudes, this being the final product of the process.

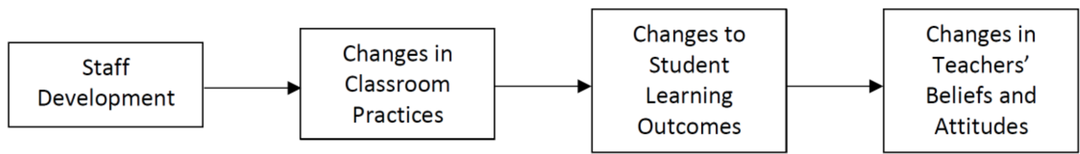


Figure 8: A model of teacher change (Guskey, 1986, p7)

Desimone (2009) describes a linear model but her model is one with bidirectional, interactive, non-recursive relationships between the four elements in the model, see figure 9. However, she states a core theory of action is likely to follow the sequence whereby new professional learning first leads to changes in a teacher's knowledge, skills, attitudes and beliefs which then leads to changed teaching practices resulting in improved student outcomes, all of which is influenced by the context in which the teacher and students are operating. The non-recursive nature of the interactions leaves some ambiguity about the ultimate endpoint of the process, but improved student outcomes is implied.

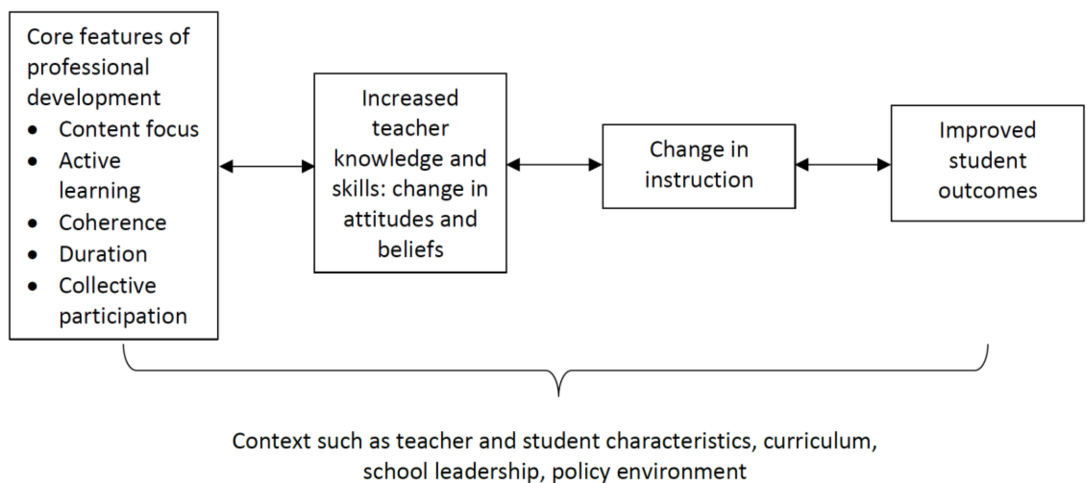


Figure 9: Proposed core conceptual framework for studying the effects of professional learning on teachers and students (Desimone, 2009, p185)

To theorise the action of a coaching mode of professional learning, Kraft, Blazar, and Hogan (2018) appear to propose a unidirectional linear path model, albeit including a few parallel elements, see figure 10. However, the process has embedded within it cycles of activity sustained over a period during which teachers have opportunities to experiment with their practices in their classrooms between coaching sessions. This implies a more complex

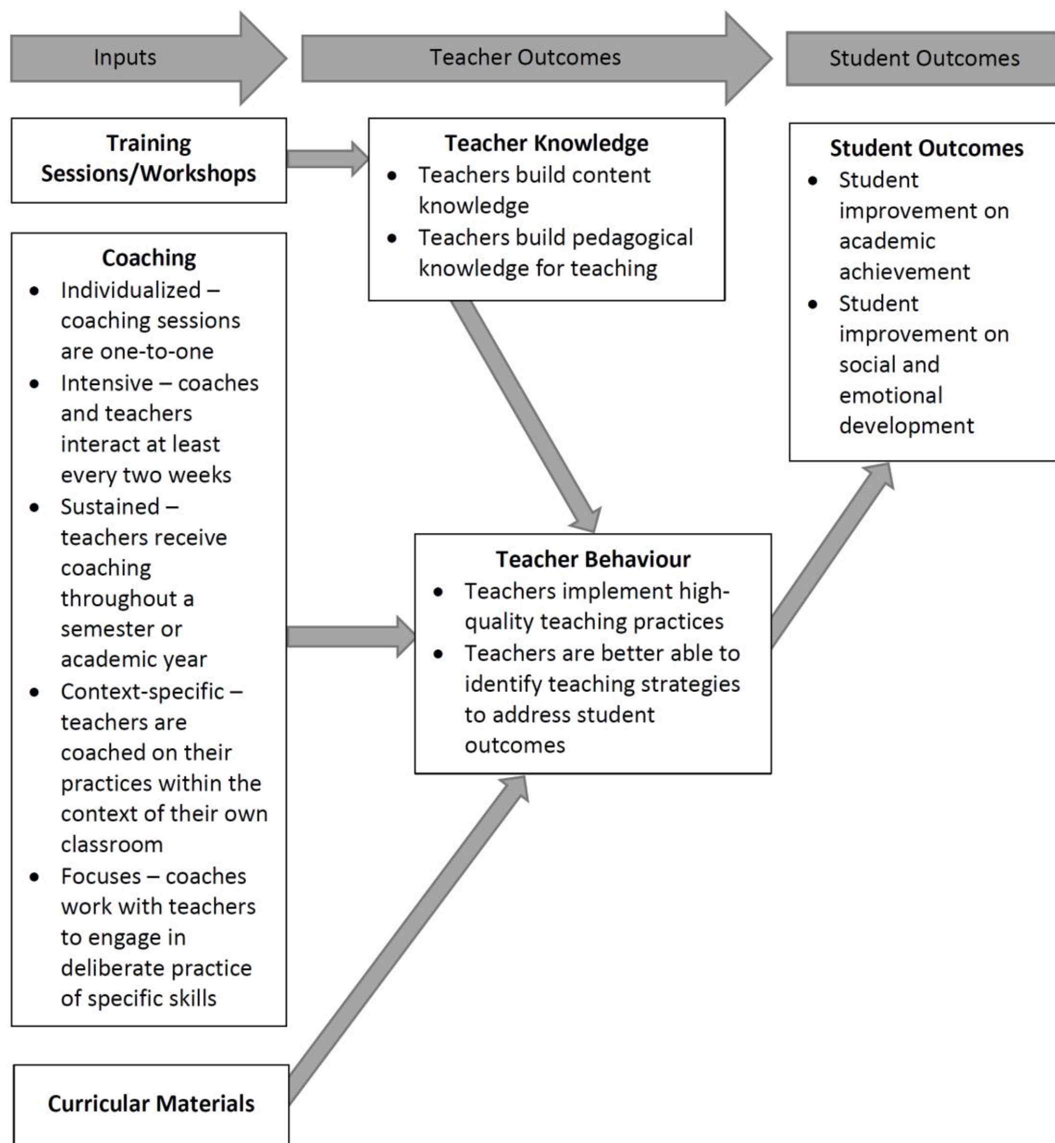


Figure 10: Model of theory in action for a coaching mode of professional learning (Kraft et al., 2018, p552)

interaction between the stages of the model than might be assumed from the diagrammatic representation alone, but like Desimone this implies improved student outcomes as the endpoint of the process.

In my view, the complexity and non-linear nature of teacher professional learning is better represented in Clarke and Hollingsworth's (2002) model of teacher growth, see figure 11. It has the advantage of being founded on empirical data from the study of the professional

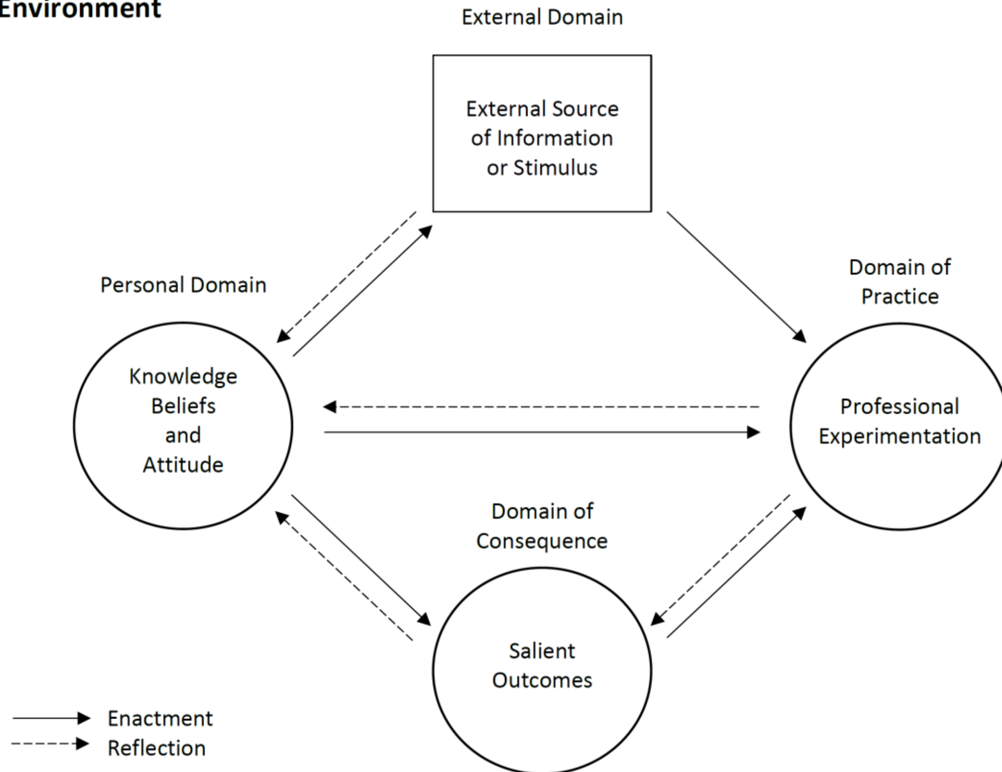


Figure 11: The interconnected model of teacher growth (Clarke & Hollingsworth, 2002, p951)

learning of mathematics and science teachers. As with Desimone's linear model it is described as an analytical tool for understanding teacher professional learning and professional growth. The model is based around four 'domains': External – the source of new information or stimulus, i.e., professional learning activities; Personal – the knowledge, beliefs and attitudes of the teacher; Practice – the professional experimentation in the classroom by the teacher, and Consequence – the salient outcomes. Clark and Hollingsworth's model allows for the identification of particular 'growth networks' or 'change sequences' between the four domains which recognise the individual and often idiosyncratic nature of teacher professional growth. They also propose that their model can be used as a predictive tool when considering potential change sequences for those planning professional learning. The exact nature of the salient outcomes of the process is also left somewhat open but would likely include improved student outcomes.

Evans (2011, 2014) has also investigated the knowledge-base required for teachers to grow professionally, and the processes for them doing so. She acknowledges:

> "*In many – if not most – respects, Clarke and Hollingsworth and I seem to be pursuing the same jigsaw pieces of knowledge that will contribute to the complete, but elusive, picture of what professional development is and how it occurs. We appear to be thinking along the same lines; Clarke and Hollingsworth's 'change sequences' approximate to my 'micro-level development."* (Evans, 2014, p185)

Evans identifies three dimensions of professional development each of which have several non-hierarchical sub-dimensions, see figure 12. Evans contends that micro-level professional learning events can contribute to professional growth in one or more of these sub-dimensions. Although Evans describes her model as reflecting a wider conceptualisation of professional growth than Clarke and Hollingsworth's model it does not represent the interplay of enactment and reflection between domains so effectively. However, she identifies a key stage as an individual recognising a 'better way' of 'doing' things, hence providing them with a rationale for undertaking the micro-level professional learning activities involved.

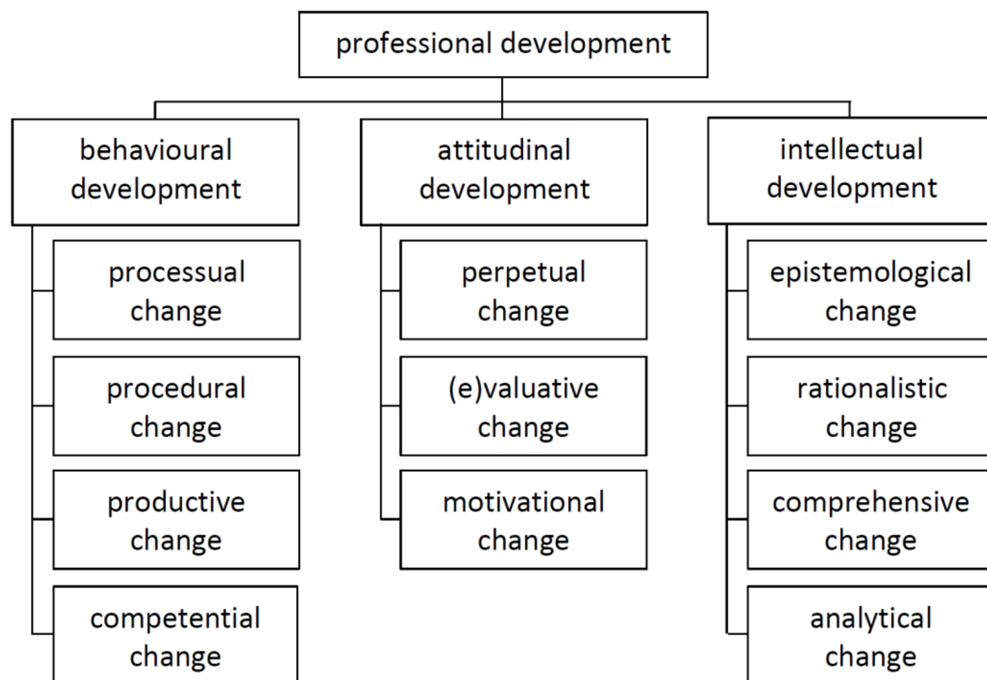


Figure 12: The componential structure of professional development (Evans, 2014, p191)

The interaction between domains in Clark and Hollingsworth's model shares similarities with the iterative interactions between the aspects in Bell and Gilbert's model for teacher development (Bell & Gilbert, 1996). Drawing on research into the professional learning of science teachers in New Zealand, Bell and Gilbert identified three interrelated aspects of professional learning: personal, social, and professional, all of which require to be attended to if professional growth is to occur due to professional learning activities leading to personal professional empowerment and collaborative social working, see figure 13.

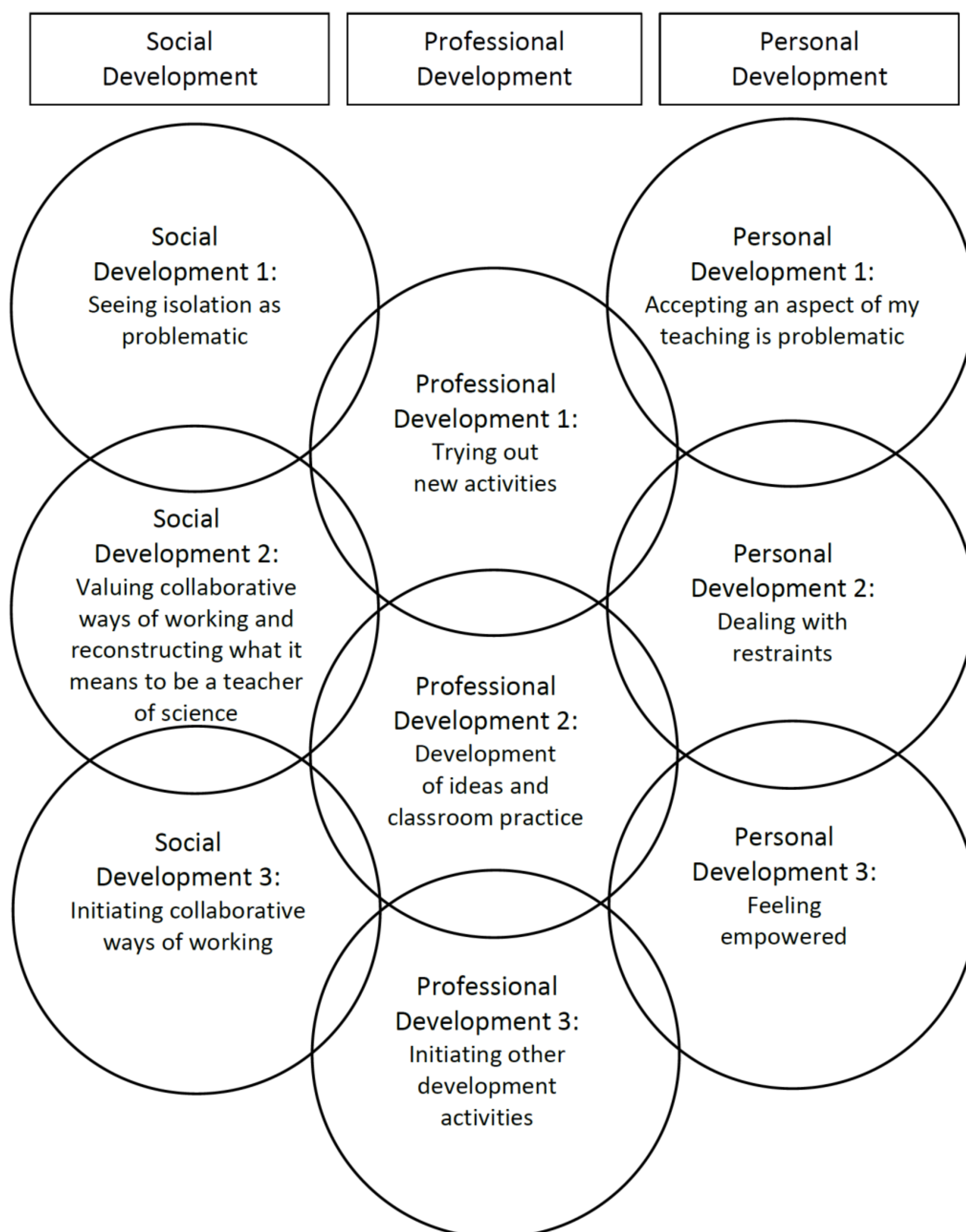


Figure 13: A model of teacher development (Bell & Gilbert, 1996, p16)

The interacting social, professional and personal development elements identified by Bell and Gilbert (1996) are similar in many ways to the elements of professional capital identified by Hargreaves and Fullan (2012). Hargreaves and Fullan introduce the concept of professional capital as necessary for "*transforming teaching in every school*" whereby the education provided by the system is improved by growing the professional capital of the teaching profession by ensuring the professional learning of teachers builds their 'human capital', i.e., the personal knowledge and skills of the individual teachers, their 'social capital', i.e., the ability of the teachers to collaborate effectively, and their 'decisional capital', i.e., their ability to make wise professional judgements. Whilst the notion of professional capital is not a model of professional growth in the same way as those of Clark and Hollingsworth and Bell and Gilbert, I consider it to nevertheless provide a useful description of the conditions, culture, and policy alignment that need to be promoted throughout the micro-level, meso-level and macro-level of the education system if professional learning is to lead to the professional growth of teachers as individuals, and thereby system-wide improvement in education as a whole.

Although Clark and Hollingsworth's and Bell and Gilbert's models are significant attempts to model the complexity of teacher professional learning and professional growth, others have called for more complex conceptualisations for teacher professional learning drawing on complexity theory (Keay et al., 2019; Opfer & Pedder, 2011). Opfer and Pedder state that "*process-product logic has dominated the literature on teacher professional learning and that has limited explanatory ability*" (2011, p376). They identify three subsystems: the teacher, the school, and the learning activity, and argue that they all interact and combine in different ways and intensities during professional learning and this complex process influences the resulting professional growth, and indeed the same professional growth can be achieved by different learning pathways. They also argue that professional learning and professional growth cannot be understood unless there is an attempt to theorize and model the complexity of the process. Opfer and Pedder do not represent their model in diagrammatic form; perhaps a tacit acknowledgement of the difficulty in representing a complex interactive process in a 2-dimensional diagram. Keay et al. (2019) as well as considering complexity theory further introduce the concept of ecological thinking to describe the relationship between the individual teacher, their school, the wider education system, and the professional learning the teacher undertakes within that system. They also identify five

complexity-informed drivers and how they inform the recursive professional learning process, see figure 14.

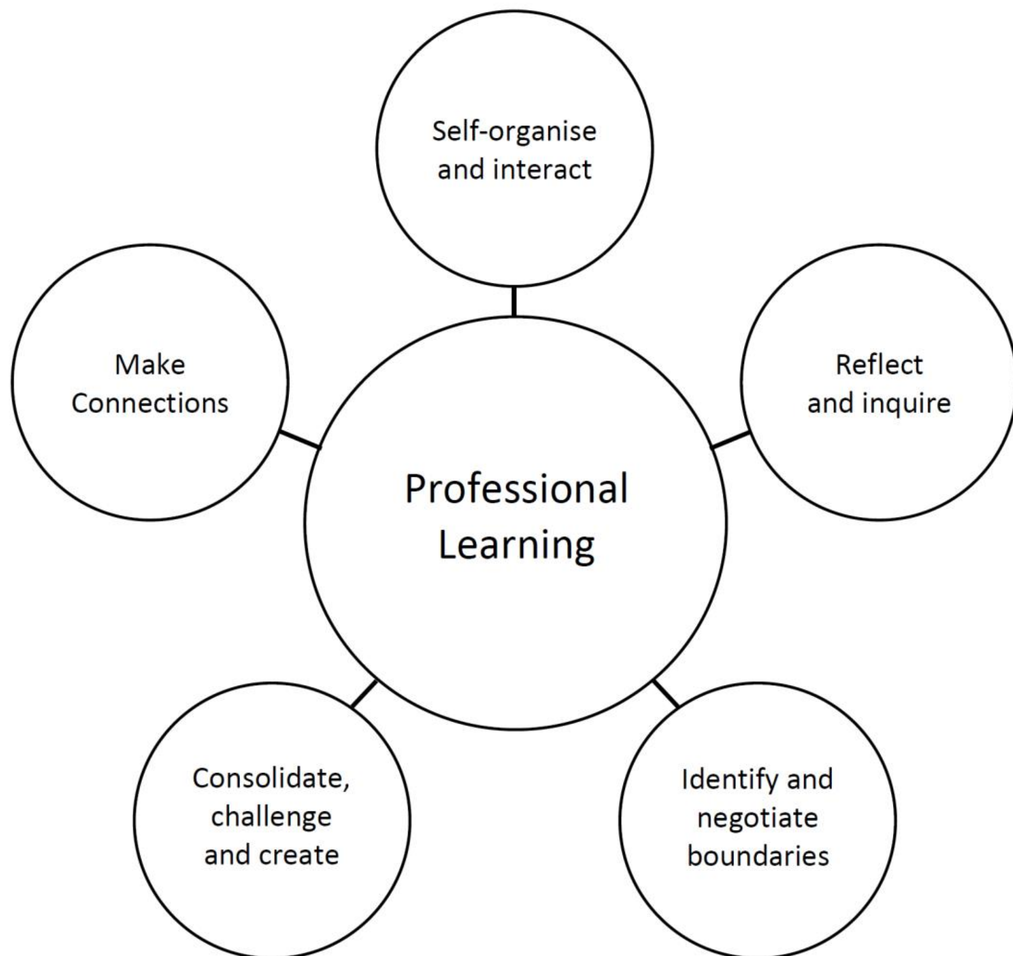


Figure 14: Complexity-informed drivers of a recursive professional learning process (Keay et al., 2019, p131)

This diagram does not attempt to show how these drivers interact with each other within the complex system nor how they relate to either actors or processes in the micro-level or meso-level of the education system. The diagram only indicates that these drivers exist and impact on professional learning and therefore I consider it to have less value either as a descriptive or analytical tool than the Clarke and Hollingsworth's change environment model.

3.2.5 Complexity

In the 1980s, the concepts of complexity theory, systems thinking, and the learning organisation developed (Senge, 2006). Although Senge developed these ideas in the context of business management, the wider education system is complex and subject to many of the same pressures as organisations more readily identified as businesses. Senge identifies that traditional forms of management which do not recognise the complexity involved can easily undermine confidence and responsibility in the actors within an organisation and keep "*organisations in perpetual fire-fighting mode, with little time and energy for innovation*". He also states the resulting "*frenzy and chaos also undermines the building of values-based cultures and opens the door for opportunistic grabs at individual power and wealth.*" (pxv). Whilst 'wealth', in financial terms, may be difficult to achieve for teachers, Senge's description will be familiar to many working in the education system where the refrain to reduce teacher workload is common (Scottish Government, 2016d; Seith, 2019). Senge advocates that systems thinking is "*the antidote to the sense of helplessness complexity can bring*" (2006, p69) and that the art of system thinking is seeing through the 'detail complexity' and identifying the underlying structures, and in doing so "*organising detail complexity into a coherent story that illuminates the cause of problems and how they can be remedied in enduring ways*" (p124). However, complexity does not just lie in a surfeit of detail but also in 'dynamic complexity' in the way components of a system interact, and Senge emphasises that understanding the dynamic complexity of any given situation is the key to success.

A consequence of the mechanistic view of many policy-makers and system leaders in education, and the predominance of one-off professional learning sessions, is that many attempts at educational reform are adopted as policy, but not implemented in practice (Cuban, 1990; Hoban, 2002). This may be for several reasons such as:

- teachers with a realism and knowledge of the complexities of the classroom may not have been sufficiently involved in the development of the policy;
- the policy may be in conflict with the existing beliefs and values of teachers;
- the policy may not be adequately explained or communicated to the wider community responsible for its implementation;

- teachers may not have the professional capital and capability required;
- adequate resource and support structures may not be available to allow the desired change, and
- immediate day-to-day, accountability, and performativity pressures may conflict with the implementation of the policy.

However, all of these reasons imply a transmissive, top-down approach to policy development and implementation without adequate scope for teachers to show either professional autonomy or teacher agency, other than that negative form of teacher agency where teachers quietly subvert, resist, or ignore the implementation of the policy (Priestley et al., 2015, p143; Robinson, 2018, p26). A mechanistic view of teaching, where it is thought that professional learning can be served well by one-off professional learning sessions, is also consistent with the idealised conceptions of teaching being 'labour', where teachers work merely in the manner of a technician, or as 'craft', where teachers master a range of strategies and techniques, as described by Wise, Darling-Hammond, Tyson-Bernstein, and McLaughlin (1984, p6) and based on the views of a large sample of teachers and principals across the USA. This is opposed to their conceptions of teaching being a 'profession' or 'art', where teachers can exercise discretionary judgements and agency and thereby better cope with the complexity and contingent moments of teaching.

It can be argued that debates about the quality of teaching and the introduction of teacher standards have increased the emphasis on teaching as a craft, with standards listing skills and competencies teachers are expected to master. It is easy, with a mechanistic view of teaching, to see these as a list of skills to be acquired, mastered and 'ticked off'. However, if the teacher standards are written in such a way as to place emphasis on teachers being engaged in professional activities which recognise the complexity of the reality of the classroom and teachers' wider professional activities then this limiting, mechanistic view of teaching might be avoided. The professional standards for teaching in Scotland (GTCS, 2021a, 2021b) whilst including the acquisition of appropriate knowledge and skills, also emphasise a commitment to the professional values of social justice, trust, respect and integrity together with growth as adaptive experts open to change through engaging with new and emerging ideas via reflection, enquiry and research. However, whilst this might be the stated policy for teachers within the Scottish education system it then begs the question

as to whether this policy is enacted in practice, or whether too many people within the system work with a mechanistic mindset or are restricted by lack of capacity, resource, or by excessive accountability, and as a result are unable to engage in transformative professional learning.

3.2.6 Models of professional growth – in conclusion

As is the very nature of models, none of those described above gives a full description of the reality of the processes of professional learning or professional growth and each alone is limited (Boylan et al., 2018). However, each shines some light through its own lens on the processes involved. Many treat professional learning as single events and not as an ongoing process with professional growth then occurring over time. All under-theorise the processes of change, with perhaps only Clark and Hollingsworth's consideration of enactment and reflection addressing this, although Evans (2014, p185) argues there is an additional internalisation process involved but there is still little consideration of what these processes might actually look like in practice. Nor is there consideration of the use of more generic learning techniques such as distributed practice (Dunlosky et al., 2013). None of the models address fully, if indeed at all, the role of teacher agency, the collaborative nature of much professional learning, or the complexity of the environment in which professional learning is conducted, especially if professional learning is to be transformative in nature, and these now deserve some consideration.

3.3 Towards transformative professional learning

In his seminal paper on adult education "*Perspective Transformation*" Mezirow (1978) introduced the concept that adult learning should result in a transformative change in the learner which results in a meaningful change in behaviour and practice. He saw such transformative change being precipitated by a dilemma which could not be resolved "*by simply acquiring more information, enhancing problem solving skills or adding to one's competencies*" (p108), i.e., not by mechanistic professional learning designed to enhance the mastery of the skills of teaching as a craft. He also stated that such transformative change can "*happen only through taking the perspective of others who have a more critical awareness of the psychocultural assumptions which shape our histories and experience*" (p109), thus emphasising the need for collaborative working and the challenge of a suitable knowledgeable other or facilitator to help the learner, such as a teacher undertaking

professional learning, to transform their perspective, and thus behaviour and practice. A recurring feature across the literature on transformative professional learning is the importance of collaborative sociality and of agency (Boylan et al., 2023, p16), so I turn to these topics next.

3.3.1 Collaboration with colleagues

Although social interactions are something not adequately addressed in the models discussed in chapter 3.2.4 (Boylan et al., 2018, p129), there is much literature which shows that high-quality collaborative professional learning impacts on both the professional practice of teachers and the outcomes of their pupils (Bryk et al., 2010; Cobb et al., 2018; Cordingley et al., 2003, 2005, 2015, 2018; Darling-Hammond et al., 2017; Harris et al., 2017; Lieberman et al., 2017; Stoll et al., 2006; Timperley et al., 2007). Collaborative working can manifest itself in various forms, both informal and formal, for example, Darling-Hammond et al. (2017) define collaboration as "*from one-to-one or small group interactions to school-wide collaboration or exchanges with other professionals beyond the school*" (p9). For the purposes of measurement, the OECD in its TALIS (Teaching and Learning International Survey) studies, categorises collaboration among teachers in two categories depending on the nature of these interactions (Schleicher, 2020, p37). These are 'exchanges and co-ordination' for simple interactions between teachers and 'professional collaboration' which implies a deeper level of co-operation. In the 2018 TALIS study, as with previous studies, it was reported that professional collaboration remains less prevalent than simple exchanges and co-ordination between teachers. Collaborative professional learning, and working with colleagues, is valued highly by teachers (Burn et al., 2010; Farmer & Childs, 2022). However, there are questions regarding what Scottish teachers understand by collaborative professional learning. In the GTCS survey on Professional Update (GTCS, 2020), whilst teachers rated the value of collaborative professional learning highly, elsewhere they rated the impact of it as being relatively low compared to other professional learning, indicating a disconnect. This disconnect may be explained by teachers not recognising fully or acknowledging the informal and implicit professional learning that takes place when working with colleagues as part of their everyday work, even if this has a significant impact on their identities, values, beliefs and knowledge (Illeris, 2014, p72; Mezirow, 2012, p75), but are still of a mindset that professional learning equates to 'going on courses'. Such informal and implicit professional learning is largely invisible, neglected, and under-researched (Evans,

2019), and the significance of it is often under-recognised by organisations and therefore insufficient time allowed for it (Eraut, 2012). For example, at a critical time of curriculum development in Scotland, teachers reported "*only occasional examples of meeting with colleagues to discuss the meaning of the principles of CfE*" (Priestley & Minty, 2013, p48).

Informal professional learning can occur between colleagues on a daily basis in staff bases, over lunch, or whenever the opportunity arises, and is often serendipitous (Hodkinson & Hodkinson, 2005; Mawhinney, 2010; McNicholl et al., 2013; Williams, 2003; Williams et al., 2001). Such professional learning may be transmissive at times, but individual micro-events, or sequences of micro-events, also have the possibility to be more complex and transformative. It can also be implicit and little recognised by the parties involved or explicit and recognised readily that professional learning has taken place. School social structures and networks are often defined by the teachers themselves and not significantly influenced by formal school organisational structures (Cole & Weinbaum, 2010, p94). More formal within-school and between-school professional learning arrangements can also take many forms including professional learning communities (PLC), teacher learning communities (TLC), or networked learning communities (NLC). TLCs are often associated with the work of Wiliam on professional learning related to Assessment for Learning (Wiliam, 2016). PLCs are frequently school-based and may encompass a department in a secondary school or cross-curricular teams of a few teachers (Bolam et al., 2005; Stoll et al., 2006). NLCs can link teachers in a number of schools and may also include partners and knowledgeable others from universities, professional bodies, or the wider community (Bell et al., 2005; Chen, 2018). Even within these formal arrangements the informal elements can be highly valued and effective (Kennedy, 2011, p33), if difficult to quantify. It is not uncommon for teachers to report the most useful parts of attending conferences or formal professional learning events are the conversations had over refreshments between the formal sessions (Netolicky, 2019, p35). Within schools there are various approaches teams of teachers may take in their professional learning such as coaching, mentoring, and peer networking (Kraft et al., 2018; Rhodes & Beneicke, 2002), lesson study (Lewis et al., 2006), learning rounds (Philpott & Oates, 2017), action research (Fazio & Melville, 2008), and practitioner enquiry (Gilchrist, 2018). All such collaborative practices display characteristics of Wenger's (1998) 'communities of practice' whereby groups work towards a shared purpose through shared knowledge, shared values, mutual engagement, and joint enterprise. In preference to 'communities of practice', Tytler et al. (2011, p878) describe 'discourse communities' as a

more useful term to describe the diverse connections made by teachers when collaborating with colleagues.

The professional learning of teachers when working with close colleagues may be transformative if they work together through enquiry cycles, or on practitioner enquiries together, but there may also be a more transmissive sharing of ‘craft skills’ element to this professional learning, such as one science teacher showing another how to set up an experiment to ensure good results. This is a situation which can be considered as one where a ‘deficit’ in one colleague is being remedied by another. The value of discussions between colleagues in such situations, and the impact these discussion have on improving the pedagogical content knowledge (Kind, 2009; Shulman, 1986, 1987) of both parties, and as a result their professional practice and impact on their pupils, should not be underestimated. Professional learning of this nature is likely to be effective as it is directly related to the teaching practice of the teachers, and firmly embedded in the context of the teachers, allowing easy and rapid transfer of knowledge. However, there is likely to be a limit to the effectiveness of this form of professional learning and a point at which “*sharing of ignorance*” (Guskey, 1999, p12) becomes a danger. For more complex forms of professional learning the input of knowledgeable others to both extend knowledge and facilitate change is likely to be required to challenge the status quo.

Teachers value working collaboratively with colleagues, especially on subject-specific matters (Farmer, 2018, p31), and subject-specific professional learning has been shown to have greater impact on pupil outcomes than generic pedagogical professional learning (Cordingley et al., 2015, 2018). The 2018 TALIS study indicated that over 25% of lower secondary school teachers had not participated in professional learning with a focus on “*knowledge and understanding of my subject field(s)*” or “*pedagogical competencies in teaching my subject field(s)*”. The Wellcome survey of subject-specific professional learning across the four nations of the UK (Cordingley et al., 2018) acknowledged it was challenging to identify the amount of subject-specific professional learning available to teachers in Scotland but suggested there was evidence that professional learning tends towards generic topics, perhaps as a result of a greater emphasis on interdisciplinary learning in CfE than had been the case previously. However, others would argue that interdisciplinary learning has not in fact been well implemented or embedded within Scottish schools and there is a need for professional learning on this issue (Royal Society of Edinburgh, 2020). Secondary schools

are generally split into departments or faculties. These act as more than administrative units, they provide the professional identity and working context for many secondary teachers (Brooks, 2016; Helms, 1998; Siskin, 1994). The department provides, for many secondary teachers, the locus for much professional discussion and collaboration about subject content knowledge and pedagogical content knowledge (Kind, 2009; Shulman, 1986, 1987) as well as other educational matters. Subject departments therefore act as discourse communities and are the primary site for much of the professional learning for many secondary teachers (Tytler et al., 2011, p872).

Effective collaboration within departments can be a problem for teachers in small schools in rural and remote geographical areas as there are few subject colleagues within any one school, and adjacent schools may be some distance away (Hargreaves, Parsley, & Cox, 2015, p306; Tytler et al., 2011, p877). School in-service days, which are sometimes co-ordinated across a local authority, provide opportunities for collaboration between schools, but there is evidence from England that these are rarely used well for collaborative professional learning (Bubb & Earley, 2009, p8). Schools in more remote areas tend to be some distance from universities, many industries, and other sources of knowledgeable others in any given subject or in education. In addition, in many countries, the recruitment and retention of staff has been shown to be difficult in rural and coastal areas, particularly in shortage subjects such as science and mathematics (Azano & Stewart, 2016; Cordingley et al., 2018; Kaden et al., 2016; Kitchenham & Chasteauneuf, 2010; Lock et al., 2009; Seith & Hepburn, 2017; Tytler et al., 2011). The provision of effective professional learning, as well as the support and valuing of the teacher by their management, is a factor which can increase teachers' satisfaction in their work and assist in the retention of teachers (Allen & Sims, 2017; Lynch et al., 2016; Mostafa & Pál, 2018; Sims, 2017) and improve pupil outcomes (Robinson et al., 2009). Mentoring and coaching are forms of collaborative professional learning which tend to be sustained over significant periods of time and the terms are frequently used somewhat interchangeably (Rhodes & Beneicke, 2002, p301). Mentoring is commonly used to support the professional learning of beginning teachers where an experienced mentor supports the mentee in an expert-novice relationship such as during a teacher's probationary period (GTCS, n.d.-c), although frequently probationer teachers have mentors from a subject different to their own, limiting the subject-specific support the mentor is able to give. Coaching can take different forms but generally involves the coach supporting those being coached to develop their own professional learning solutions to the issues they face.

Coaching and mentoring have been seen to provide significant gains (Kraft, Blazar, & Hogan, 2018, p577) but tend to be relatively expensive in staff time and to have relatively few beneficiaries (Wayne et al., 2008, p470) which raises questions about their scalability as a means of supporting CLPL. However, peer-networking of subject teachers, both within and between schools, provides a means of forming a relevant discourse community and "*working together to enhance information exchange, dissemination of good practices, and the organisation of mutual support and learning*" (Rhodes & Beneicke, 2002, p301).

Whichever means is used, effective collaboration will build the 'social capital' of a group of colleagues, one of the key components of 'professional capital' (Hargreaves & Fullan, 2012). The OECD (2015, pp131-133), in their review of Scottish education, describe how a school is greater than the aggregate of the individual teachers working there. It comments on the need to build collaborative professionalism in Scottish schools with coherent approaches to collegiate working, particularly with a focus on those forms having the greatest impact on pupil learning. It describes social capital as consisting of collective efficacy – the belief that teachers can have a positive effect together, collective responsibility – the shared responsibility for success amongst colleagues, and collective autonomy. It describes collective autonomy as meaning that teachers have high autonomy from the requirements of top-down accountability, but low autonomy from each other as fellow professionals making judgments and developing expertise together. Such high autonomy from accountability and low autonomy from colleagues is clearly consistent with an activist teacher stance and transformative professionalism. However, there remains a tension between bottom-up, teacher-led collaboration and guided, systemic improvement initiatives. Teachers appreciate opportunities to work together, but the use of this time is not always maximised (Farmer, 2018, p35; Schleicher, 2020, p38), however, attempting to overly steer the direction of collaboration can be poorly received by teachers and there is always a risk of "*contrived collegialit*y" (Hargreaves & Dawe, 1990). Schleicher reports that:

> "*Many systems have found it difficult to build collaborative cultures in schools, and to extend these beyond a few enthusiastic well-led schools and school districts.*" (p38)

How well placed both the Scottish educational system, and individual teachers, are to achieve good collaborative professionalism can clearly be questioned given the mixed messages

regarding accountability and professionalism in recent Scottish educational policy documents as raised in chapter 2 and discussed further in chapter 5.1.

3.3.2 Teacher agency and teacher autonomy

Kennedy states "*autonomy is only ever transformative if it is translated into agency*" (2014, p693) and links an increase in teacher agency with a move along her spectrum of professional learning towards more transformative conceptions which generally involves more collaborative approaches. However, this raises the question of cause and effect and whether increased teacher agency leads to more transformative professional learning or whether more transformative professional learning leads to more teacher agency, or whether it is some interlinked iterative process, also influenced by other factors. The nature of agency is described by Priestley et al. (2015, p19) as a slippery and contested term but they go on to argue, convincingly in my view, that it is not a capacity possessed by an individual but that it is something done by an actor and achieved as the outcome of the interplay between the actor and their context, and influenced by such factors as past experiences and the availability of resources. Priestley et al. advocate an ecological approach to theorising teacher agency where it is informed by the past (iterational), oriented to the future (projective), but acted out in the present (practical-evaluative).

How teacher agency is perceived by teachers and policy makers is influenced by beliefs, both in terms of the role of teachers and methods of educational reform. Biesta et al. (2015) describe:

> "*There is an ongoing tension within educational policy worldwide between countries that seek to reduce the opportunities for teachers to exert judgement and control over their own work, and those who seek to promote it. Some see teacher agency as a weakness within the operation of schools and seek to replace it with evidence-based and data-driven approaches, whereas others argue that because of the complexities of situated educational practices, teacher agency is an indispensable element of good and meaningful education.*" (p624)

This therefore raises the issue of how well the culture of the education system supports agency in its teachers even within the all-pervading scenario of everyone in education, politics, and wider society wishing to see general improvements in education and pupil

outcomes. There are many in educational system reform who advocate that this is most effective through improving support for teachers and the quality of teaching, and this is mostly likely to occur within a system where policies and support at all levels are well aligned (Evers & Kneyber, 2016; Hargreaves & Fullan, 2012; Hargreaves & Shirley, 2009; Mourshed et al., 2010; Sahlberg, 2015). In such systems, teachers are well supported and facilitated by leaders in the meso-level and macro-level rather than subjected to increased accountability, bureaucracy, and control; policy and process Sahlberg describes as GERM, the global educational reform movement (Sahlberg, 2015, p142), or Groundwater-Smith and Mockler describe as an 'age of compliance' (Groundwater-Smith & Mockler, 2010).

Priestley et al. (2015) state that "*the promotion of teacher agency – at individual, cultural and structural level – may contribute to countering many top-down developments that, over the past decades, have tried to control the education system rather than promote its intelligent operation*" (p164), suggesting they do not support the practices of the global educational reform movement but consider teacher agency as a driver for more transformative activity within the education system, however, at the same time that without a supportive education system environment, or ecology, then teacher agency is unlikely to be achieved. The view that teacher agency is important for transformative change is also consistent with Sachs's view of teacher activism. Sachs states "*At the centre of this new or transformative professionalism is the need for teachers to understand themselves better and the society in which they live*" (Sachs, 2003b, p14). Sachs describes a protocol for an activist teaching profession which displays transformative professionalism, and which is based on nine principles:

1. Inclusiveness rather than exclusiveness
2. Collective and collaborative action
3. Effective communication of aims and expectations
4. Recognition of the expertise of all parties involved
5. Creating an environment of trust and mutual respect
6. Ethical practice
7. Being responsive and responsible
8. Acting with passion
9. Experiencing pleasure and having fun (Sachs, 2003b, pp147-9).

Sachs describes the transformative professionalism displayed by such activist teachers as one that must come from the members of the profession itself, i.e., the teachers, but it must be supported and facilitated by other interest groups and stakeholders, i.e., those in the meso-level. Hence, Sachs's description of teacher activism is the same in many ways to teacher agency, and one which is dependent both on the individual and the context in which they find themselves. She also is clear that transformative professionalism across the whole teaching profession is something to aspire to and may well take considerable time and effort to achieve (Sachs, 2003b, p16). However, she argues that doing so is a worthwhile endeavour which will pay off in improved student outcomes as well as having benefits for the teaching profession itself; a transformative change.

Autonomy and agency are often linked in the literature, as indeed is the case in Kennedy's model, see figure 6. Whilst teacher agency is something to be achieved by teachers, teacher autonomy is the freedom to act or function independently. Fullan (1993, p12) argues that "*each educator has some control (more than is exercised) over what he or she does*". Indeed it can be argued that teaching can be a very, and too often, solitary profession with insufficient collaboration and collegiate working, even although a teacher working in such an environment may not feel he or she has a great deal of autonomy over key decisions affecting their practice (Hoban, 2002, p171). There is clearly a tension in the education system between teacher autonomy, and the ability of each teacher to 'do what they please', and a coherence to the education system and the educational experiences of learners as they move from one teacher to another during their school career. It has been shown that professional autonomy is strongly corellated to job satisfaction, perceptions of workload manageability, and retention in the teaching profession (Worth & Van Den Brande, 2020) and this is particularly strongly related to the ability to influence decision-making, i.e., an important aspect of the capacity to display agency, over their professional learning goals. In their study of teachers in England, Worth and Van Den Brande found that teachers reported relatively low levels of autonomy over decision-making about their professional learning and that increasing teachers' autonomy over setting their professional learning goals has the greatest potential to increase teacher job satisfaction and job retention compared to all other areas investigated in the study (Worth & Van Den Brande, 2020, p16). Teacher autonomy and system coherence or alignment is not a 'zero-sum game', it should be possible to achieve high levels of both and in doing so create a culture of innovative collaboration which promotes teacher agency, see table 2.

	Low teacher autonomy	*High teacher autonomy*
High system alignment	Authorative conformity	Innovative collaboration
Low system alignment	Micro-managed indifference	Chaotic experimentation

Table 2: Combined effects of teacher autonomy and system alignment (Worth & Van Den Brande, 2020, p17)

There is evidence that high performing education systems have a high level of coherence across all aspects of their education system including curriculum, textbooks, pedagogy, assessment, professional learning, and policy drivers and incentives are well aligned and reinforce each other (Crehan, 2016; Oates, 2017; Schmidt & Prawat, 2006). This coherence and alignment ensures teachers are not pulled in several different directions at once. However, Schmidt and Prawat's comparative work shows that this level of coherence need not necessarily derive from top-down policy or dictat. A system can exercise a degree of control through shared understandings and common practices rather than organisations and institutions exerting control. Therefore it appears a well designed coherent education system with good policy alignment across many aspects can promote high levels of professional autonomy and teacher agency and lead to good outcomes both for individual students and the education system as a whole. This therefore raises the question as to how professional learning can best be used to support such coherence and develop shared understandings amongst the teaching profession, and what barriers might prevent this.

3.4 Barriers to fit-for-purpose professional learning

Despite the policy drivers in Scotland to 'empower' teachers (Education Scotland, 2021a) and move towards creating greater teacher agency with a "*culture of 'pull' from teachers rather than 'push' from outside the classroom*" (Donaldson, 2010, p10), Livingston (2012, p169) reports that not every teacher feels ready or able to do this without support, and therefore professional learning. Kelly (2016), in a project involving over 1000 Scottish teachers into the development of teacher leadership, identified similar barriers:

> "*The most common responses in the workshops were time, workload and confidence. However, there was also frequent mention of a lack of opportunities for experience, appropriate professional learning, recognition, support, encouragement and trust.*

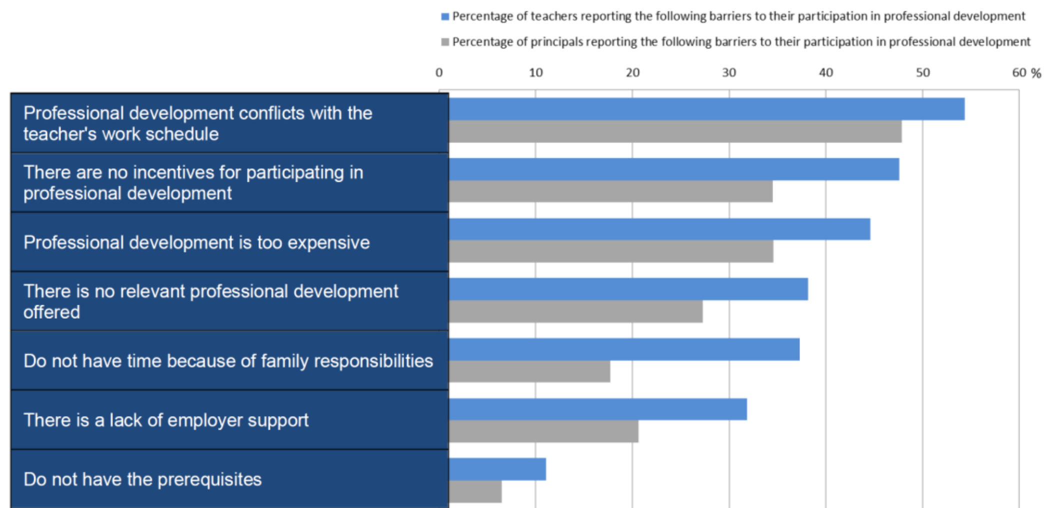
> *There was very often the mention of the role of hierarchies in Scottish education in stifling creativity, innovation and leadership. ... The issue of lack of cover came up frequently, as did unnecessary bureaucracy.*" (p12)

More recently, in the GTCS's study of teachers' views of Professional Update (GTCS, 2020), it was reported that "*increasingly across the period of the study, time and workload were cited as major contributing factors that limited/hindered engagement with Professional Standards to self-evaluate and plan professional learning*" (p9), and "*there are an increasing number of comments around the perceived decrease in staffing numbers and lack of funding to support teachers to access professional learning opportunities*" (p9). This had coincided with a period when council budgets had decreased (Ogden et al., 2023). There was also some evidence of a lack of leadership or employer support, at least insofar as teachers being able to see their desired professional learning needs through; "*some respondents commented that although they had clearly identified their next steps in professional learning, this was then changed by ... other school priorities being given prominence and determining their professional learning*" (p10).

These findings from Scotland are similar to those found in many other countries; it would appear this is a persistent and international problem. The 2013 TALIS study (OECD, 2014, p112) identified a number of barriers for teachers participating in professional learning. Around half of teachers in the international sample identified that professional learning conflicted with their work schedule and that there were no incentives for them to participate in professional learning activities. Other significant barriers were professional learning being too expensive; no relevant professional learning being available; lack of time due to family commitments, and lack of employer support. This pattern was little changed five years later in the 2018 TALIS study (OECD, 2019b), as can be seen in figure 15.

It can also be seen from figure 15 that teachers consistently report that the barriers to participation are greater than do school leaders. A difference in perception between teachers and school leaders is reported in other studies, for example, in England 57% of secondary school senior leaders reported the desire for more subject-specific CLPL whereas this was the case for 87% of secondary class teachers (Cordingley et al., 2018, p20).

Results based on responses of lower secondary teachers and principals (OECD average)[1, 2]



1. OECD average covers 31 countries for teachers and 30 countries for principals (see Annex B).
2. Includes teachers and principals who "agree" or "strongly agree" that the following elements present barriers to their participation in professional development.

Values are ranked in descending order of the percentage of teachers reporting the following barriers to their participation in professional development.

Figure 15: Types of barriers to teachers' and principals' participation in professional development (OECD, 2019b, p177)

Also in England, a survey (Department for Education, 2018) consisting of interviews with 1798 teachers and school leaders conducted in the summer of 2018, 91% reported there were barriers to accessing effective professional learning. Cost, followed by a lack of time, a lack of good quality professional learning being available locally, and a lack of cover teachers to enable release being the main barriers mentioned.

In a study of 23 professional learning communities in the Netherlands, Prenger et al. (2017, p84) reported high workload and lack of time hindered the collaboration of participants due to lack of preparation for, and absence from, meetings. They also reported (p88) that geographical issues did not have a significant impact on professional learning in networked professional learning communities, although the Netherlands is a relatively densely populated country. Difficulty accessing effective professional learning is an issue affecting teachers in rural areas of Australia (Tytler et al., 2011, p872). Teachers working in small departments in remote areas have a very limited pool of colleagues with which to interact, especially in their own subject, something projects such as that in the Pacific Northwest described by Hargreaves, Parsley and Cox (2015) have sought to address through between-school networks. Such collaboration with colleagues working in a similar context is an

important factor in effective professional learning (Cordingley et al., 2018), and although exacerbated by geography even teachers in large schools in densely populated areas can experience isolation (Ali Ostovar-Nameghi & Sheikhahmadi, 2016; Flinders, 1988).

The lack of time for collaborative professional learning with colleagues has been reported as a major issue for teachers in Scotland (Farmer, 2018) which is likely to be exacerbated due to Scottish teachers having one of the highest contracted teacher-pupil contact hours when compared to other countries (OECD, 2019a, p417). The OECD team tasked with reviewing CfE observed that the relatively high class contact time of Scottish teachers was incompatible with their role as local curriculum-makers and recommended teachers be given greater, ring-fenced, non-contact time to allow for local curriculum-making, including the collegiate work with colleagues that entails (OECD, 2021, p125). The need to address this issue recurred in the follow up reports of Muir (2022, p48) and Campbell and Harris (2023, p52).

What is largely absent in this literature, is a recognition of how individual teachers are supported or constrained by the organisational contexts in which they teach. Shapira et al.'s (2023) research shows that accountability and performativity cultures are widespread in Scottish secondary schools and teachers working is such contexts are likely to find barriers to them exhibiting agency in a positive manner. This is occurring despite the evidence that working in supportive professional learning environments can have a significant impact on the attitudes of teachers to their work, workplaces, and professional learning and on the outcomes of the pupils they teach, and that they can be improved if appropriate actions are taken (Kraft et al., 2016; Kraft & Papay, 2014; Leonardi et al., 2022).

3.5 Professional learning availability

3.5.1 Teachers' views of the available professional learning

Writing in the first edition of *Scottish Education* about the views of teachers towards professional learning, Marker (1999) paints a picture in which professional learning was held in low regard by Scottish teachers. He went on to say that the provision was frequently fragmented and questioned why so much of the available professional learning had been focused on management and appraisal training rather than on improving teaching and learning, as well as questioning how the quality of school-based professional learning could be raised. Purdon (2003, p942) opens the equivalent chapter of the second edition of

Scottish Education in a much more up-beat tone with "*since the first edition of 'Scottish Education' was published in 1999 the world of professional development for teachers in Scotland has changed considerably – a pattern that seems likely to continue*". Events such as the Scottish Parliament being reopened, the consultation on a 'CPD Framework', and the McCrone agreement had clearly changed the mood, for some at least (Purdon, 2001, p111). How much this pattern has indeed continued is nevertheless debatable as discussed in chapter 2. Purdon touches on this herself, as she states that with the embracing of a standards-based and competency-based approach to professional learning this was taking it in a direction founded on a business approach to education where performance management and target-setting dominate (Purdon, 2003, p946).

Studies from around the world frequently report relatively low satisfaction levels with the professional learning opportunities available to teachers, particularly in secondary schools, (Darling-Hammond et al., 2009, p21; Hustler, McNamara, Jarvis, Londra, & Campbell, 2003, p19; Timperley, Parr, & Bertanees, 2009, p228; Tytler et al., 2011, p875). In the 2018 TALIS study teachers reported that the professional learning they considered to have the greatest impact on their practice are those based on strong subject and curriculum content and involve collaborative approaches to instruction, however, they also report that their participation rates in professional learning including these features is low (Schleicher, 2020, p19), suggesting opportunities to access such professional learning is restricted or teachers were under some pressure to attend alternative professional learning activities. Gilchrist (2018), a former headteacher, describes the traditional local authority approach to professional learning for teachers in a rural area in the south of Scotland as:

> "*a mish-mash of different activities that teachers opted in or out of, or which were imposed on us from outside by our local authority, and which usually changed on a yearly basis, or when we got a new Director of Education.*" (p69)

In his book, Gilchrist goes on to describe the approach he and his staff took to embed practitioner enquiry in their practice, with advice and facilitation from a university teacher educator, and that "*interesting conversations at the local authority and at director level*" (p70) were necessary for this to be allowed to occur. This highlights issues around empowerment and control of headteachers and teachers in practice. During semi-structured interviews with 26 teachers of physics across six secondary schools in four local authorities

in the north-east of Scotland, their views on local authority and school-based professional learning were generally negative and indicated it did not meet their needs well (Farmer, 2018). For example, when commenting about a large centrally organised local authority learning festival one teacher said:

> "*[The Learning Festival was] as much use as a hole in the head. We were told to go but it was the biggest waste of my time and not appropriate for our needs at the time.*" (p35)

Many of the teachers indicated they had very little direct contact with central staff from their local authority, did not know their remits, did not know if there was anyone tasked with supporting their professional learning, and doubted the capacity of the local authority to provide such support, especially in subject-specific matters. There was also a perception that local authority staff were more focused on quality assurance and accountability than support for teachers, and a teacher commented:

> "*It feels like there is 'Big Brother' even if there is no-one actually watching, and this is not an appropriate manner to treat professionals.*" (p36)

It is clear that for many teachers the culture around professional learning, and their experience of that provided through their employers is not meeting their needs well, something also highlighted in studies in other education systems (Allen, 2019; Timperley, Parr, & Bertanees, 2009, p228; Tytler et al., 2011, p875). The need for a culture change was highlighted by Kennedy (2013, p935) in the fourth edition of *Scottish Education*, both in terms of what teachers expect of their professional learning and what is expected of teachers. Financial pressures on local authorities since the breakup of the regional councils into the unitary local authorities in 1996, and austerity since the financial crash of 2008, has also limited the capacity of local authorities to provide professional learning support. It is perhaps unsurprising that, against this background, in the fifth edition of *Scottish Education*, Kennedy and Beck (2018) write:

> "*There has recently been a significant shift towards teacher-led forms of professional learning in Scotland: informal events or collaborative spaces that encourage teachers to promote or share ideas, enquiry or research.*" (p854)

It would appear that, perhaps in increasing numbers, teachers are displaying some teacher agency or sufficient confidence and looking beyond the professional learning provided by their employers for alternative provision which better meets their needs (Holme, 2021). Despite this trend, improving the quality of available professional learning is important for both meeting the needs of teachers and improving the performance of the Scottish education system and the outcomes of its pupils. This requires effective leadership.

3.5.2 Leadership of professional learning

Good leadership is essential for professional learning to be successful, especially if that is to occur in consistently impactful ways across a school or the education system more widely. As Bubb and Earley (2007) state "*professional development does not just happen – it has to be managed and led*." (p28). Timperley (2008, p22) lists "*Active Leadership*" as one of her ten key principles for ensuring professional learning is effective. An example of what might be meant by this is described by Daly (2010) in terms of how teachers might be encouraged to collaborate in their professional learning. He states that "*merely providing time and directives to 'work together' does not necessarily result in meaningful collaboration*" (p3). For effective professional learning in a group of teachers it is not only important to have expertise within that group, and time and space to share that expertise, but there must be sufficient leadership and facilitation to be able to identify who has the expertise and to be able to access and co-ordinate it (Coburn, et al., 2010, p48), or to know when to look outwith that group for expertise, and to ensure there is sufficient resource to support the activities of the group. In their review of evidence on the effective leadership of professional learning, Cordingley et al. (2020) state that effective professional learning by teachers is dependent on having an effective environment for professional learning in schools and this environment is shaped by the values leaders promote, how they are rooted in their community, how they enact and model professional learning themselves, and the systems and structures they design to operationalise them. They also identify practices required of school leaders if they are to maximise the impact of professional learning on school improvement. They state that "*what matters is how CPDL [Continuing Professional Development and Learning] activities [are] designed* ***and aligned*** *to support active professional learning focused on aspirations for pupils*" (emphasis in original) (Cordingley et al., 2020, p6). Perhaps this is well summed up in this statement by Frost (2011):

"... *teachers really can lead innovation; teachers really can build professional knowledge; teachers really can develop the capacity for leadership, and teachers really can influence their colleagues and the nature of professional practice in their schools. However, what is abundantly clear is that teachers are only likely to do these things if they are provided with appropriate support.*" (p57)

The effective leadership of professional learning is both complex and nuanced. The OECD (2011) compared the failure of many educational change initiatives in the USA with successful ones in Ontario and concluded that most top-down educational change initiatives were:

"*unable to achieve deep and lasting changes in practice because:*

- *the reforms were focuses on things that were too distant from the instructional core of teaching and learning;*
- *the reforms assumed that teachers would know how to do things they actually didn't know how to do;*
- *too many conflicting reforms asked teachers to do too many things simultaneously; and*
- *teachers and schools did not buy in to the reform strategy*." (p74)

These are all features that will resonate to some extent for many Scottish teachers (McIlroy, 2018, p626) and with observations by Chapman and Donaldson (2023). The lack of leadership, time for meeting and group administration, too little focus on teaching and learning but too much on administrative issues and accountability agendas dictated by the local authority was commonly cited by teachers as compromising the effectiveness of local authority subject groups (Farmer, 2018, p35). The OECD report goes on to state that:

"*to achieve sustained change, then, would require:*

- *Strategies directly focused on improving the act of teaching.*
- *Careful and detailed attention to implementation, along with opportunities for teachers to practice new ideas and learn from their colleagues.*
- *A single integrated strategy and one set of expectations for both teachers and students.*
- *Support from teachers for the reforms.*" (OECD, 2011, p74)

Robinson et al. (2009) show that school leaders can make a difference to pupil outcomes, both achievement and well-being, and the largest single factor affecting this is their promotion of, and participation in, teacher professional learning activities (p42). In doing so school leaders have a deeper appreciation of the conditions required to achieve and sustain improvements in pupil learning, and are better able to discuss with and support teachers to make the necessary changes to class organisation, resourcing and assessment. A consistent feature in the literature for effective collaborative professional learning is the need to build trust amongst participants in order that they avoid defensiveness but engage positively in sharing practice and experimentation (Adams & Miskell, 2016; Bolam et al., 2005; Bryk & Schneider, 2003; Stoll et al., 2006). It is important that those responsible for the leadership of professional learning develop school cultures which promote teacher learning through communities of practice (Wenger, 1998) that are focused on improving pupil learning. Effective communities of this nature have a strong sense of collective responsibility and accountability for pupil achievement and well-being; this is very much consistent with the transformative conceptions of professionalism of Hargreaves and O'Connor (2018) and Sachs (2003b).

One approach to school leadership with a clear and strong focus on a consistent approach to improving teaching and learning through the professional learning of teachers is described by Robertson (2020) in his, somewhat provocatively but probably accurately titled, book '*The Teaching Delusion: Why teaching in our schools isn't good enough (and how we can make it better)*'. This approach has resulted in a positive change in culture and the development of an effective community of practice with resultant improvements in pupil outcomes in a Scottish secondary school. It is clear that when school and system leaders follow research evidence, make research papers and books readily available, develop a common language and understanding around teaching and professional learning, and support the implementation of fit-for-purpose professional learning for their teachers with a consistent focus on improving teaching and pupil learning this can result in improved pupil outcomes, improved school and system performance, more motivated and engaged teachers, and a much greater likelihood of the exhibition of teacher agency and transformative professionalism throughout the education system. This is consistent with the plausible professional learning mechanisms identified by Coe et al. (2022, p37) who also identify the importance of teachers' understanding the teaching and learning of their subject(s) (Coe et al., 2020, p17). However, the provision of subject-specific professional learning appears to

be valued and prioritised less by school and system leaders than by teachers (Cordingley et al., 2018). The potential benefits of subject-specific professional learning are explored next.

3.5.3 Subject-specific professional learning

Much of the discussion above has been related to the 'why' and 'how' of professional learning but not the 'what'. However, the first two of Timperley's ten principles for effective professional learning are that it should be focused on valued student outcomes and have worthwhile content (Timperley, 2008), and Campbell (2019, p68) lists as her first component of effective professional learning that it should have "*quality content"* which *"includes attention to subject-specific and pedagogical content knowledge*". A number of reviews make the claim that subject-specific professional learning is generally more effective at changing the practice of teachers than generic professional learning (Cordingley et al., 2018; Desimone, 2009; Desimone et al., 2006; Garet et al., 2001; Institute of Physics, 2020b; Wei et al., 2009). Hill and Papay (2022, p9) state that professional learning targeting the improvement of subject-specific instructional practices is more impactful than professional learning focused on developing teachers' subject content knowledge alone. The Great Teaching Toolkit (Coe et al., 2020) places a teacher's need to "*understand the content they are teaching and how it is learnt*" (p5) as the first priority for teachers wishing to help their pupils' learning and the Wellcome CPD Challenge (Leonardi, 2020; Leonardi et al., 2022) sets the criteria that at least 50% of teachers' professional learning should be subject-specific. This target was set against a background where the amount of subject-specific professional learning available, perhaps with the exception of the STEM subjects, is small with most school-based professional learning focused on generic school improvement topics (Young et al., 2014, p198).

Subject-specific professional learning is clearly more than just a focus on content knowledge, but defining exactly what is meant by subject-specific in the literature is relatively difficult. Cordingley et al. (2018), in a report focused on subject-specific professional learning, identify three aspects of subject-specific professional learning:

> "*Subject-specific CPD is defined here in terms of programmes and activities which focus on enhancing teachers' understanding of the subjects they teach (i.e. subject knowledge); how pupils learn in those subjects and how to teach them (sometimes called pedagogic content knowledge); and/or helping teachers to understand how*

generic CPD might apply to specific learning issues in the subjects they teach, in explicit and structured ways." (p2)

This is a simple and effective description. 'Subject-specific' versus 'generic' is not a simple dichotomy but they are on a spectrum drawing not just on subject content knowledge but particularly on pedagogical content knowledge (Kind, 2009; Shulman, 1986). For example, what might be seen as a more generic pedagogical skill such as questioning, the asking of good questions of pupils to provoke their deep thinking and to uncover their understanding, actually requires a good level of subject-specific knowledge such as knowing and anticipating common misconceptions, and having deep and connected knowledge of the subject content in order for a teacher to respond appropriately and effectively to pupil answers with suitable prompts or follow-up questions. However, the subject-specific knowledge required by a teacher can be quite granular and vary with both topics within a subject or discipline and the level being taught. For example, the knowledge needed by a teacher to able to ask questions effectively even within one topic, such as forces within physics, will vary significantly when teaching five-year-old pupils compared to eighteen-year-old pupils. Therefore, if professional learning is to result in professional growth of the participants there is a need for it to include generic principles but also for these to be explored and practised within the subject-specific context in which the teacher works. Such professional learning has been shown to be valued highly by teachers (Cordingley et al., p20, 2018; Farmer, 2018; Tytler et al., 2011, p876). Integrating general pedagogical ideas with subject content and high-quality instructional materials has also been shown to have significant impact on teacher practices and pupil learning (Cobb et al., 2018; Lynch et al., 2019). High-performing education systems also frequently promote collaborative, enquiry-based professional learning focused on developing subject expertise (Cordingley et al., 2018, p23). However, there is evidence the professional learning available to teachers in Scotland tends towards the generic, perhaps as a result of CfE privileging skills and interdisciplinary learning compared to disciplinary knowledge (Cordingley et al., 2018, p11), which is consistent with the OECD's review of CfE and the need for greater clarity for the role of knowledge in the curriculum (OECD, 2021). For several years, Education Scotland has conducted professional learning surveys of practitioners in the STEM subjects in early learning and childcare, primary, secondary, and additional support needs settings (Education Scotland, 2019b, 2021b, 2022a). Consistently the top three priorities for professional learning have been identified as effective pedagogy, skills progression, and curriculum development in the STEM subjects. The need for more

subject-specific professional learning as well as that on effective learning and teaching practices was also reported by Muir (2022, p48) and Campbell and Harris (2023, pp51-2). This shows that teachers in all sectors of Scottish education wish to engage in subject-specific professional learning in the subjects they teach above professional learning in other topics.

If it is accepted that teachers require knowledge and skills on a topic and level basis it becomes clear that a teacher's degree qualifications and initial teacher education are unlikely to have provided a good knowledge of all topics within a subject or across all levels any teacher in Scotland is likely to be expected to teach, whether that be a primary teacher teaching a wide range of subjects to pupils aged five to twelve or secondary teacher teaching across all of the topics within one or more subjects to pupils aged twelve to eighteen. There is therefore a need for subject-specific career-long professional learning to support teachers' professional growth whilst in-service. However, this still leaves questions around identifying the active mechanisms involved in effective professional learning and how to identify when effective professional learning is occurring. This is explored next.

3.6 Identifying professional learning

3.6.1 Professional learning mechanisms

Despite the general consensus on the features of effective professional learning as described in chapter 3.2.3, it is contested. This is due to problems aggregating data across meta-studies and meta-meta-studies, a technique popularised by Hattie (2003), a lack of specificity of the actual practices used in studies, and a lack of data for some settings (Cheung & Slavin, 2016). Yoon et al. (2007), in analysing 1300 studies potentially addressing the effect of teacher professional learning on pupil achievement outcomes, considered only nine met the relatively rigorous What Works Clearinghouse evidence standards (Institute of Education Sciences, n.d.), and all of them focused on primary aged pupils, indicating that at least before 2007 there was a dearth of studies on the professional learning of secondary teachers which met these standards. In a review for the Education Endowment Foundation, Sims et al. (2021) attempt to go beyond the features of professional learning to identify the mechanisms which characterise effective professional learning. They question the methodologies and assumptions used in previous meta-studies and propose a methodology, based on the analysis of programmes, forms and mechanisms, to identify professional learning which "*is effective, as opposed to just plausible, interesting or enjoyable*" (Sims & Fletcher-Wood, 2019,

p79). There are also questions over cause and effect; is it that the professional learning that leads to changes in attitudes, beliefs, practices and culture, or is it only because of a pre-existing culture that the forms of professional learning which are seen as being most effective are enabled and allowed to occur? Again, this may vary to some extent depending on the purpose of the professional learning and in attempting to distil a relatively simple message the complexity of teacher professional learning might not be fully acknowledged.

In their review, Sims et al. identify four purposes of professional learning:

- Helping teachers gain new insights (I)
- Helping teachers pursue new goal-directed behaviours (G)
- Helping teachers acquire new skills or techniques (T), and
- Helping teachers embed changes in their practice (P).

Sims et al. applied quite narrow inclusion criteria on the studies included in their review. These criteria included only considering randomised control trial studies conducted in OECD countries, published in English after 2001, and where outcomes were measured in terms of the performance of students in standardised tests. A statistical analysis was applied to the reported effect sizes from the 104 studies which were included, although over 70% of these were in the USA. They only included mechanisms where there was empirical causal evidence not only in teacher professional learning studies but in other domains such as psychology, health promotion and behavioural medicine. This resulted in fourteen mechanisms which they grouped against the four purposes as listed in table 3.

Sims et al. found that there was a correlation between the number of mechanisms included in any professional learning programme and outcomes, and that professional learning programmes which include mechanisms balanced across all four purposes are more likely to be effective. Three forms of professional learning: instructional coaching; lesson study, and strong teacher learning communities were identified as possibly providing a vehicle for professional learning with a balance of mechanisms, although over two-thirds of the studies considered could not be assigned to one of these three forms which implies effective mechanisms could be found in a wide range of professional learning activities. However, programmes of professional learning which included a combination of instructional

Purpose	Mechanism
Insight (I)	Manage cognitive load
	Revisit prior learning
Goals (G)	Goal setting
	Creditable source
	Praise/reinforcement
Techniques (T)	Instruction
	Practical social support
	Modelling
	Feedback
	Rehearsal
Practice (P)	Prompts/cues
	Action planning
	Self-monitoring
	Context-specific repetition

Table 3: The professional learning mechanisms integrated into the IGTP model (Sims et al., 2021, p21)

coaching, lesson study, and strong teacher learning communities were shown to have three times the effect on student test scores than programmes only involving one of the three forms. This is consistent with Evans's (2014, p192) observation that more effective professional learning activities will likely involve multiple aspects of her three dimensions of professional development. It is also consistent with the findings of Cobb et al. (2018) in their eight-year study into improving middle school mathematics in schools across four large districts in the USA. They showed the importance of combining a range of activities including high quality professional learning conferences/events, instructional coaching, teacher collaboration time, and teacher networks together with good instructional materials and support for currently struggling students.

Sims et al. also investigated how well programmes of professional learning were implemented, although this was only based on twenty-two Education Endowment Foundation funded studies in England. Nevertheless they identified three strong themes (Sims et al., 2021, pp54-5):

- High fidelity is unlikely – even programmes which were implemented relatively faithfully saw substantial adaptation and deviation from planned programmes.
- The support system, intervention design, and school context influence implementation – good guidance and teacher educator support are important for translating good ideas into practice, support from school leaders, and time to make the intervention work are all required.
- Interventions are more likely to be implemented when they fit schools' and teachers' needs – it is important there be good alignment between the intervention, the school's priorities, and the reality of the classroom, which then makes teachers' participation straightforward and convenient.

Again, these findings are consistent with those of Cobb et al. (2018, pp236-7) and with Bryk et al. (2010) from their extensive studies in the USA.

Sims et al. acknowledge the limitations in their review (2021, p55, p59), particularly the narrow criteria used giving a limited number of studies in a limited range of contexts, and the variation of definition of terms in different studies, however, it is a significant attempt to identify the active ingredients in teacher professional learning rather than broader forms or modes of professional learning as has been the case in other reviews and meta-studies.

The work of Cobb et al. (2018) and Sims et al. (2021) nevertheless both show that even the most well designed programmes of professional learning are rarely implemented effectively. It is therefore appropriate to consider how the professional learning actually experienced by teachers might be identified.

3.6.2 Identifying professional learning activities

To identify what professional learning is undertaken by teachers it is first necessary to define what actually counts as a professional learning activity. It is universally acknowledged that participation in courses and events such as conferences is professional learning but professional learning can take many forms and take place in many settings and the impact of more implicit and informal professional learning is frequently overlooked or not given adequate recognition (Evans, 2019).

In Scotland, there is a formal requirement for teachers to undertake professional learning, both to meet the standards for registration as a teacher, ongoing reaccreditation (GTCS, n.d.-e, 2012d), and as part of the nationally agreed pay and conditions of service negotiated between national government, local authority employers and teachers' unions through the Scottish Negotiating Committee for Teachers (SNCT). Teachers have a contractual expectation to undertake 35 hours of professional learning per year (SNCT, 2007, para. 3.11). The Educational Institute of Scotland, Scotland's largest teachers' union, in its code of practice on working time arrangements for teachers describes the professional learning activities to be undertaken by teachers during the 35 hours shall "*consist of an appropriate balance of personal professional development, small scale school based activity, attendance at nationally accredited courses or other CPD activities*" (EIS, n.d.-a); which leaves a broad interpretation of what activities might qualify. However, each teacher also has to have their professional learning plan for the year agreed by their line-manager as part of the teacher's annual Professional Review and Development (PRD) process (GTCS, n.d.-d) which therefore places an element of responsibility for deciding what professional learning might be deemed appropriate on the line-managers of teachers. There are also five in-service days per year where schools are closed to pupils but open to staff to allow for collegiate working as planned by their employers (SNCT, 2007, para. 3.5). During these five days some of the activities undertaken by teachers will be administrative in nature but there is a general expectation that some, if not most, of this time should be spent on professional learning that leads to the professional growth of teachers. Teachers in Scotland have a nominal working week of 35 hours, although there is evidence that many teachers work significantly more than this (EIS, n.d.-b). Within this 35 hours, the maximum class contact time is 22.5 hours and local arrangements are in place for the negotiation of the use of some of the remaining time for teachers working collegiately, some of which might be on professional learning activities (EIS, n.d.; SNCT, 2007, para. 3.9; SSTA, 2019b). The contractual arrangement described here means that there is a requirement for teachers to undertake professional learning and for there to be opportunities for them to do so, within their normal working week and at other times, however, the nature of that professional learning can be variable and not necessarily always recognised as such, either by teachers or their line-managers.

To identify the extent of participation of teachers in professional learning activities it is necessary to first identify a list of possible activities and describe examples of each. This will enable teachers to better identify when they have undertaken professional learning,

including examples they may have previously overlooked or not considered as worthy of acknowledgement. Wong and Bautista (2018, p547) found that teachers identified three types of professional learning: formal (facilitator-led), informal (teacher-led), and individual (self-directed). The participation in formal activities such as nationally accredited courses like postgraduate study at a university, events organised by national agencies Education Scotland, SSERC, or the Scottish Qualification's Authority, conferences organised by subject associations, or events organised by local authorities or schools on in-service days are likely to be readily recognised by teachers as professional learning activities, not least because participation in many of these will mean travelling outwith the teacher's normal workplace. Teachers are also likely to identify individual activities such as reading, whether books, journals, magazines, or online, as professional learning. However, asking teachers to identify more implicit, informal, or workplace-based professional learning is likely to be more difficult.

Teachers value working with colleagues (Farmer, 2018; Wong & Bautista, 2018) and learning from or with other teachers from similar contexts has been shown to be effective (Cordingley et al., 2018; Hargreaves et al., 2015). However, much of the learning from colleagues can be informal, ad hoc, and serendipitous rather than planned and formalised, although the terms formal and informal are better considered as the ends of a spectrum rather than two distinct dichotomous categories. In addition to learning from colleagues, informal learning can also take place in the spaces around more formal professional learning activities, such as during lunch at a conference. Teachers work with colleagues in discourse communities and communities of practice which provide opportunities for both formal and informal professional learning. Formal opportunities might include the sharing of best practice between colleagues at departmental meetings, during in-service days, during other meetings typically organised at lunchtimes of at the end of the day, or as part of professional learning communities. Informal learning can take place in staffrooms and staff bases (Mawhinney, 2010; McNicholl et al., 2013) but also through chance conversations and observations. Eraut, mainly working with professions other than teaching, such as accountancy and nursing, has identified the importance of the social significance of the professional learning from colleagues which takes place in the workplace (Eraut, 2004, 2007, 2011) and Smylie (1995, p100) describes how learning can occur incidentally around other activities in the workplace.

Eraut also makes the distinction between informal and implicit professional learning which are often mistakenly taken as synonymous, as presumably are the complementary formal

and explicit. Implicit learning is frequently a characteristic of informal learning but at times informal professional learning might be quite explicit in nature to both the learner and the educator, such as when an experienced science teacher shows a less experienced colleague how to follow important health and safety advice. Eraut also identifies other possible characteristics of informal learning such as unintended, opportunistic, and unstructured (Eraut, 2004, p250), all reflecting the serendipitous nature of much informal professional learning. During such interactions it is possible for colleagues to make some of their otherwise tacit professional knowledge visible to colleagues. Whilst it is possible to plan professional learning where a teacher educator or colleague purposefully makes their tacit knowledge visible to others (Crowe & Berry, 2007; Loughran, 1995) opportunities to do so are also likely to arise in unforeseen ways at the point of need through conversations between colleagues (McNicholl et al., 2013). Evans describes such events as "*micro-level PD*" (Evans, 2014, p186, 2019, p8), and considers these as being similar to, or perhaps even smaller than, Eraut's "*episodes*" (Eraut, 2004). Eraut and Evans see these short 'micro-events' as the basic units or building blocks of an individual's professional learning journey which can be made up of countless such micro-events spread over a wide range of opportunities along the formal to informal spectrum. Many of these micro-events might combine or merge into a form of chain reaction, or build into professional learning cycles, collectively leading to significant professional growth in the individual (Evans, 2019, p8). The professional growth resulting from the progress of any individual through a series of micro-events is likely to be complex and to be far from linear or to progress in a consistent predictable manner as it will vary greatly from individual to individual depending on their motivations, their prior knowledge and experiences, and their existing schema (Furst, 2019, p76; Kahneman, 2012, p52). Evans argues that it is only by breaking down a teacher's professional learning journey into these micro-events and scrutinising how they contribute to that journey and investigating the cognitive processes involved will we be able to develop a good understanding of how professional learning leads to the professional growth of teachers. She goes on to paraphrase Clarke and Hollingsworth (2002):

> "*understanding the process by which practitioners grow professionally and the conditions that support and promote that growth – requires a shift of focus from the obvious to the discreet, from the overt to the covert. We need to fix our attention more squarely and more determinedly than has hitherto been the case on informal*

professional development – including implicit professional learning or development" (Evans, 2019, p9)

If we are to truly understand the mysteries of the professional learning process it is therefore important that due attention is given to the informal end of the formal-informal spectrum of professional learning, and also attempts are made to identify and reveal situations where implicit professional learning is actually taking place, even where these might be "*mindlessly assimilative*" (Mezirow, 2012, p75) but may nevertheless lead to "*incremental transformation*" (Mezirow, 2012, p86).

Clarke and Hollingsworth's model of professional growth illustrates, see figure 11, that professional growth is unlikely to take place in the moment of professional learning. That is not to deny teachers having occasional 'light bulb' moments during a professional learning activity, but changes resulting in professional growth are likely to take place over time with periods of enactment, such as experimentation in the classroom, and reflection; reflection-on-action as described by (Schön, 1983, p278). It is through this iterative process that teachers will restructure their professional knowledge-base, such as that described by Shulman's (1986) pedagogical content knowledge (PCK) and Rowland's (2013) Knowledge Quartet. It is only by breaking professional learning down into its component micro-level events and investigating what takes place during and as a result of these that we will be able to gain a good grasp of the effectiveness of any professional learning and gain an understanding of what professional growth takes place in individual teachers, or what changes take place in their teaching practices as a result (Evans, 2019, p9; Tillema & Imants, 1995, p142). Professional growth is likely to not only occur as a direct result of participation in an individual or group of micro-level events but due to the cognitive processes taking place between or after events.

Some may not view the process of breaking a teacher's professional learning journey down into many micro-events as a fruitful process. The efficacy of one-off professional learning events, such as talks given by visiting speakers on a school in-service day, has been frequently called into question (Darling-Hammond et al., 2009, p9; Hoban, 2002, p39; Yoon et al., 2007, p1), and this is likely to be the case if teachers are not given opportunities to follow up and build on such events in meaningful ways. How transformative is a teacher's experience of a series of micro-events will likely depend on how well that programme fits the needs of that

teacher. As a result, a nuanced and complex programme of micro-events, which includes many of Timperley's ten principles or Sim et al.'s fourteen mechanisms, is more likely to provide this transformative experience. The capacity of a teacher to put such a programme of micro-events together is therefore likely to depend on several factors including teacher empowerment; teacher agency; professional learning facilitation; access to knowledgeable others; adequate resource – time and funding; a trusting professional environment, and appropriate professional learning opportunities.

In Scotland the PRD process is intended to facilitate this, although teachers do not always consider this to be the case (GTCS, 2020; Watson & Fox, 2015). The individual professional learning needs of a teacher are informed by the wider developmental priorities of their school, but this is not likely to be exclusively so, which can introduce tension (Huberman & Guskey, 1995), especially when time and resources are in short supply. Glover and Law (1996, p31) identified four different potential sources of professional learning needs pulling on teachers: individual needs; departmental needs; whole-institutional needs, and at least on occasions, multi-institutional needs, such as the schools within a local authority. As well as teachers being able to demonstrate agency, their line-managers and the senior leadership of their school must be able to demonstrate appropriate leadership, facilitation, and guidance in supporting teachers develop a coherent programme of professional learning, all of which are subject to different power dynamics and the potential for hegemonic relationships to appear. The professional learning journey taken by a teacher will also very much depend on the professional learning opportunities available to that teacher. At the informal end of the spectrum this will to a significant extent depend on an individual teacher's colleagues, but also their level of engagement in other more informal activities such as social media, reading blogs, or listening to podcasts. Physics teachers in Scotland also have access to both formal and more informal professional learning and networking opportunities through subject bodies such as the Institute of Physics and Association for Science Education.

In identifying and researching the extent of the professional learning undertaken by a teacher it is therefore important to ensure teachers recognise fully when professional learning is taking place, including informal opportunities and from broader learning experiences (Netolicky, 2019, p12), and to document this sufficiently. To identify the impact of any professional learning event on their professional growth through changes in their teaching practices, knowledge, and beliefs it is necessary to revisit the topic and encourage teachers

to reflect on any changes which have occurred as a result, and again to document this sufficiently. This process is in itself likely to have a professional learning benefit, not least due to ensuring the teacher revisits and reflects on the professional learning over time, hence sustaining the professional learning, but also by introducing metacognition, retrieval practice and/or spaced practice elements into the process thereby improving the resulting learning.

3.7 Transformational change through transformative professional learning

The terms transformational and transformative are often used interchangeably. However, transformational change tends to be used in relation to an organisation, when the change occurring is complete across that organisation, whereas transformative change is often used in relation to a significant change in the behaviour and practices of an individual. Within the education system, it should surely be the aim to ensure that effective professional learning, which meets the needs of the individual teachers, and thereby improves their knowledge-base and thereby the learning of the pupils they teach, also transforms the culture and learning environment in which they work. Professional learning should ideally be both transformative for the individual teachers but also transformational for the education system. Boylan et al. (2023, p665) relate critical professionalism to the characteristics of transformative professional learning which they identify as:

- purpose – for educational, social, and political transformation
- agency – to suppose activist professionalism
- sociality – collaborative partnerships
- knowledge – criticality about knowledge and knowledge production.

They also identify that transformative professional learning displaying these characteristics can be enacted in different ways such as collaborative enquiry and practitioner research, training, or workshops led by experts and peers. Whilst this in no doubt the case, it is nevertheless important that the professional learning activities and micro-events involved are embedded within a culture of enquiry as stance.

As is explored earlier in this chapter, teacher professional learning is complex and individual micro-events may have many different purposes. Different modes of professional learning will be more or less suitable for addressing the different purposes, including one-off transmissive micro-events designed to address a deficit in a teacher’s knowledge-base.

However, if teachers are to work in a culture of transformative professionalism which is promoted in documents such as the GTCS professional standards (GTCS, 2021a, 2021b), exhibit teacher agency, and participate in the collaborative activities which go with this, it is important that teachers also engage in programmes featuring a wide range of appropriate micro-events including some that take a collaborative enquiry approach.

The professional capacity and knowledge-base of teachers can be enhanced by fit-for-purpose professional learning resulting in the professional growth of teachers through improvements in their knowledge, beliefs, attitudes, and instructional practices (Clarke & Hollingsworth, 2002), and in the growth of teacher voice in policymaking (Groundwater-Smith & Mockler, 2010; Sachs, 2003b). This is founded on teachers taking an enquiry stance (Cochran-Smith & Lytle, 2009, p44) by identifying, both individually and through collaboration with colleagues, problems needing to be addressed in order to improve instruction and pupil outcomes. It is then necessary to gather appropriate evidence and data, compile programmes of appropriate professional learning micro-events, before experimenting with what has been learned from these during instruction, and then evaluating changes. This takes place over time through iterative cycles (Donohoo & Velasco, 2016; Korthagen & Kessels, 1999; Timperley et al., 2007) thus gradually embedding improvements into practice and ensuring the process becomes a habit. Findings from the process can also be shared with others, perhaps at both 'village' and 'world' levels (Groundwater-Smith & Mockler, 2010, p132), giving teachers a voice, and so influencing future policymaking. This process is modelled in figure 16.

The knowledge-base of the teacher, drawing on Berliner (2004), Rowland (2013) and Shulman (1986), is highlighted in bold as it is through the growth of this aspect of the model that improvements in the salient outcomes for pupils, the educational system, and the teachers themselves will be obtained. The development of a teacher's knowledge-base improves the crucial instructional core of interactions they have with their pupils and the subject matter being taught in their classroom as highlighted in figure 1 on p13. The cyclical and iterative nature of the process described in this model also provides a fertile environment for the professional learning mechanisms identified by Sims et al. (2021) to be embedded in practice as stance. The model primarily focuses on the enquiry-based professional learning process from the perspective of the individual, however, no individual

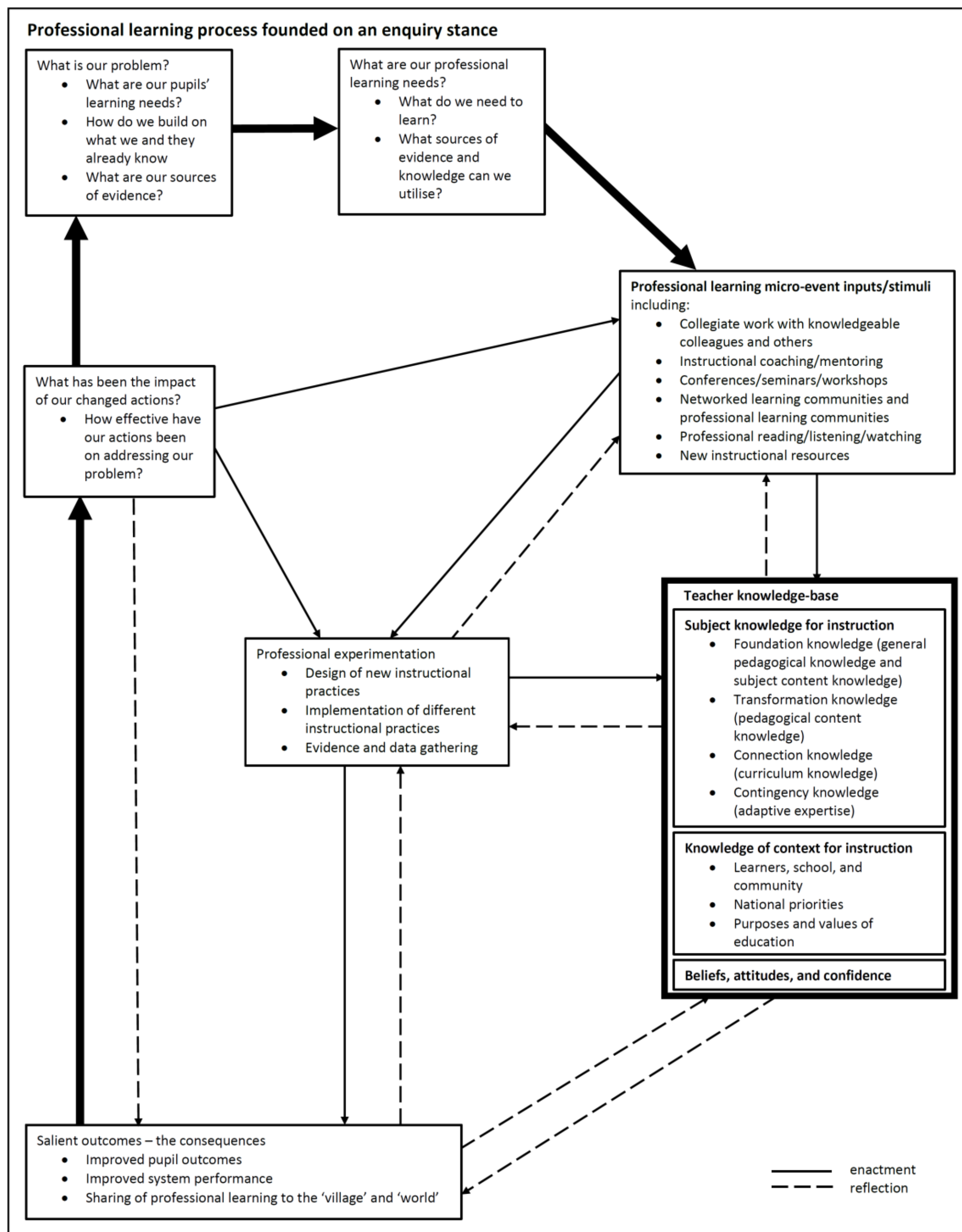


Figure 16: Enquiry-based professional learning, adapted from Clarke and Hollingsworth (2002), Cobb et al. (2018), Evans (2019), Rowland (2013), and Timperley et al. (2007)

is an island and there will almost always be a social or collaborative aspect, as alluded to by the range of professional learning micro-event inputs/stimuli listed and the sharing of salient outcomes to the 'village' and the 'world'. However, the social aspect of the process is

perhaps still not adequately represented in the model in figure 16 (Boylan et al., 2018, p129; Moore et al., 2021, p335).

Professional learning activities can take many modes and consist of many micro-events as described by Eraut (2004) and Evans (2019). Professional learning micro events can be relatively isolated, spiral into a chain-reaction of micro-events which merge into each other (Evans, 2019, p8), or be combined into coherent programmes as described by Cobb et al. (2018) or extensive award-bearing courses such as masters-level courses. This study attempts to gather data on the range of professional learning micro-events experienced and valued by teachers, and explore whether these build into more coherent programmes, as this is largely missing from the literature. It also attempts to establish whether these micro-events have then impacted on the teacher's practice and/or knowledge-base some time after their occurrence, which may well depend on whether or not opportunities for reflection and enactment as described in figure 16 have been available. Gathering such data is important to enable comparisons to be made with policy documents and with professional learning best-practice, and to investigate where barriers and misalignments might exist which hamper both the professional growth of individual teachers and school and system-wide improvements in educational outcomes.

Chapter 4 Methodology

4.1 Introduction

This study developed from previous research I conducted as part of an MSc (Farmer, 2018). That research consisted of an investigation into the professional learning of a network of physics teachers in a relatively remote and rural area of Scotland. This study also developed from my professional experiences, described in chapter 1, and the literature reviewed in chapters 2 and 3, the selection of which was inevitably influenced by both my previous research and experiences. In addition, this study was also shaped by my work context, both as a former physics teacher and as a teacher educator of teachers of physics, and in particular my interest in supporting and improving the professional learning experience of teachers of physics, particularly in relatively remote and rural areas. This shaped the research topic and helped refine the more specific research questions. My previous research identified that physics teachers in Scotland particularly value subject-specific, collaborative professional learning with colleagues, both within and between schools, with suitable input and challenge from knowledgeable others. However, a number of barriers existed, including different policies and initiatives pulling teachers in different directions, which then often prevented teacher professional learning being realised to the extent and quality desired (Farmer, 2018; Farmer & Childs, 2022).

Given the reasonable consensus around the features of effective professional learning, as identified in chapter 3, and a national policy framework which is generally consistent with the realisation of such professional learning, as laid out in the literature review, this study therefore set out to investigate how closely aligned the professional learning experiences of teachers are to those advocated by policy, and where the experiences of teachers are not well aligned with policy to explore why this might be the case. Considering this overall research context this chapter presents the research questions, and a rationale for the general methodological approach adopted, before going on to describe and justify the research strategies used.

4.2 The research questions

RQ1 What does current policy tell us about teacher career-long professional learning?

RQ2 How can we chart teacher professional learning experiences and what does this tell us about teacher career-long professional learning in practice?

RQ3 How well do actual teacher professional learning experiences align with policy?

4.3 Ontological and epistemological positioning

Educational research is frequently classified, somewhat simplistically, as either 'quantitative' or 'qualitative' (Punch & Oancea, 2014, p4; Robson & McCartan, 2016, p18), although it has also been argued in recent decades that there is a third classification 'mixed-methods', involving an amalgam of the first two (Biesta, 2010; Johnson & Onwuegbuzie, 2004; Punch & Oancea, 2014, p338). Whilst data can be relatively easily described as quantitative, i.e., numerical, or qualitative, i.e., non-numerical, to use the two terms to describe research paradigms can be unhelpful as it hides the exact nature of the methodological, epistemological and ontological assumptions which underpin approaches, and which can be quite varied. Quantitative research primarily emerged from the 'positivist' view of the nature of the sciences (Robson & McCartan, 2016, p21). As my original disciplinary background is physics and mathematics, and this study is set in the context of the teaching of physics, it might be considered the most natural form of research for me to undertake. However, this positivist view of the nature of the sciences which, for example, led to the Newtonian deterministic understanding of the Universe with a fixed concept of space and time external to the observer, an external 'reality', has been overtaken (Chalmers, 1978; Lederman & Lederman, 2014). During the last century or more, with the developments such as the Einsteinian physics of relativistic spacetime and quantum mechanics, it has been recognised that 'reality' is a much more personal construct with probabilistic and chaotic behaviours, and uncertainty pervading the Universe. This change is recognised in the 'post-positivist' view of quantitative research, most likely to take a deductive, hypothesis testing or theory refutation approach, but which recognises that in all research processes there are human influences of power, politics and ideology. I also have a background in qualitative research having previously completed both an MBA in Educational Management and an MSc in Teacher Education where most of the research conducted for assignments and dissertations

involved qualitative methods and inductive analysis. Qualitative research can involve a wide range of approaches but is generally of a 'constructivist' or 'interpretivist' nature, and is widely associated with the social sciences, of which education is an example.

Perhaps reflecting my mixed background, this study is best described as 'pragmatic'; research which sits in a middle ground between philosophical dogmatism and scepticism, and rejects traditional dualisms by taking a more moderate and common sense view of philosophical dualisms depending on how well they solve the problem of interest (Johnson & Onwuegbuzie, 2004, p18). Biesta (2010) argues that pragmatism is not so much a philosophical paradigm but a "*set of philosophical tools that can be used to address problems*" (p97). Indeed, Biesta goes further, and states that the use of the term and concept of paradigms in describing research is unhelpful, as in using a single collective term this diminishes the complexity and variety of potentially different aspects making up the research approach. This study is also what Robson and McCartan (2016) describe as "*real world research*" of the type "*congenial to real world researchers whose main concern is to get on with the job, i.e. to come up with answers to the problems they are trying to address*" (p28). This is consistent with my 'insider' role as someone with a long history of working in the fields of physics education and physics teacher education which allows me to be guided by practical experience as well as by theory. Although the pragmatic approach may be recognised by many as a relatively recent construct, it has a rich history of use in education. Pierce, James and Dewey, in the late 18th and early 19th centuries, applied pragmatic principles in developing their philosophies and practices in educating children. Johnson and Onwuegbuzie (2004) state:

> "*Pierce, James and Dewey were all interested in examining practical consequences and empirical findings to help in understanding the import of philosophical positions and, importantly, to help in deciding which action to take next as one attempts to better understand real-world phenomena (including psychological, social, and educational phenomena).*" (p17)

Johnson and Onwuegbuzie (2004, p18) highlight taking a pragmatic approach as privileging action and practical theory over philosophising, even describing it as an 'anti-philosophy', but also an approach which can adapt to the constantly changing nature of a complex field such as teacher professional learning based on complex social interactions between individuals

and their environment. Nevertheless, a number of weaknesses have been identified with taking a pragmatic approach, such as it giving more attention to applied research than basic research, the purpose of the research sometimes being vague, and it being rejected by many philosophers because of its logical failing as a solution to many philosophical disputes. However, as a pragmatist I can select the research approaches that offer the best opportunities for answering the research questions identified. The research questions are therefore fundamental in the approach, and research methods should follow the research questions.

4.4 A pragmatic, interpretive, abductive approach

Despite my philosophical stance being pragmatic and this being most closely associated with mixed-methods research, it is my judgement that the methods most suitable for this study are set firmly towards the qualitative end of the research methods spectrum, with most of the data gathered being qualitative and there being limited opportunities to gather quantitative data. It was, from the outset, intended as a deep exploration of the 'how' and 'why' questions of a complex issue rather than an attempt to obtain statistically significant data. The study investigates the professional learning experiences of teachers of physics and how this compares with the intended professional learning experience as laid out in national policies, and as intended by those with policy shaping and implementation roles within the education system. The study is therefore designed with a strong 'interpretivist' qualitative approach. My previous research (Farmer, 2018) produced a simplistic hypothesis of sorts; "*that policy and practice in facilitating and delivering professional learning for teachers is not as well aligned through the levels of the education system as it ought to be, and this then hampers both the delivery of national policy and fit-for-purpose professional learning for teachers*". Therefore, it could be considered that there is a 'deductive' element to the analysis of the research with an element of testing findings against this hypothesis, but the explorative, interpretive approach inevitably also has an 'inductive' element to analysis with patterns and explanations emerging from the data. Given the research involves comparing and interpreting the views about teacher professional learning of different actors within the education system it is therefore probably better to describe the main approach to analysis as 'abductive'. The complexity of the field of study means that it is not possible to gather complete data from a large sample of actors but reasonable inferences, and most likely explanations, can be drawn from the available data. Therefore an abductive approach is

appropriate in this case as it is a means to explanations and understandings of a complex field with the outcome being a narrative for practical learning consistent with the description of the research as both 'pragmatic' and 'real world' (Johnson & Onwuegbuzie, 2004, p17; Mezirow, 2012, p77; Robson & McCartan, 2016, p67) and the case-study nature of the research (Dubois & Gadde, 2002; Punch & Oancea, 2014, p153). This abductive approach is not merely a mix of deductive and inductive approaches but has many similarities with an inductive approach based on grounded theory (Dubois & Gadde, 2002, p559) and in reflexive thematic analysis (Braun & Clarke, 2022). By applying abductive reasoning in the analysis of the data of the study, simple and plausible conclusions and explanations are sought which can then be helpful for shaping policy and practice.

4.5 A case-study approach

As a pragmatic, qualitative, interpretivist piece of research that is intended to cast a light on the issues around providing good quality, fit-for-purpose professional learning to teachers of physics in Scotland, the nature and choice of the participants is therefore an important consideration. The sample of participants needs to generate a manageable data set so therefore cannot be too large, but for reasonable lessons to be learned from the research which might then be applied more generally across the Scottish education system there needs to be a reasonable number and diversity of participants. Early in the research design process I decided to restrict the potential range of sample by eliminating some variables, such as only focusing on the professional learning of physics teachers in Scottish schools, largely due to my work context and experience. I then also decided to focus on physics teachers in state funded secondary schools in only the Northern Alliance (Northern Alliance, n.d.), one of the six regional improvement collaboratives (RICs) in Scotland, partly for convenience reasons, but also to reduce another potential variable. Further details of the Northern Alliance are given in appendix 1 together with definitions of remote and rural. I also decided to only include teachers who had reached the top of the main teachers' salary scale, typically after six years of teaching, or were in a middle leadership promoted post which are normally filled by teachers who have gained several years of experience as a teacher previously. This was a means of ensuring the teacher participants had a reasonable minimum length of professional learning journey to describe and comment upon. The teacher participants were selected in a purposeful manner (Cohen et al., 2000, p103) to give a cross-section of teachers at different stages in their careers and from across a range of

schools of different sizes and locations from across the RIC (Sharratt, 2020), see table 4 for details.

Name	Role	Teaching experience	School location (Scottish Government, 2022a)	Approximate school roll	Local authority
Albert	Teacher	>20 years	Other urban area	1200	D
Andrew	Principal Teacher	<10 years	Remote rural	700	D
Ava	Teacher	>20 years	Accessible small town	850	D
Calum	Principal Teacher	>20 years	Accessible rural	450	E
Clara	Teacher	>20 years	Very remote rural	350	F
Dani	Principal Teacher	10-20 years	Remote small town	1000	D
David	Teacher	<10 years	Very remote rural	100	A
George	Teacher	10-20 years	Very remote rural	100	C
Gill	Principal Teacher	>20 years	Remote small town	400	E
John	Teacher	10-20 years	Very remote small town	1000	B
Luke	Teacher	10-20 years	Accessible small town	850	E
Neal	Principal Teacher	>20 years	Very remote rural	150	H

Table 4: Teacher participants (school location information is from the Urban Rural 8-fold Classification (Scottish Government, 2022a), see appendix 1)

It is hoped that despite these restrictions there is nevertheless enough commonality within the Scottish education system that lessons from one RIC, especially one covering more than half of the land area of Scotland, can provide useful knowledge and understanding which might be generalisable elsewhere, if contextualised properly. Whilst the teacher, school leader, and local authority employed participants were all from the Northern Alliance some of the system leader participants had national remits covering all RICs and not just the Northern Alliance, see table 5.

Name	Role	Organisation
Billy	Quality Improvement Officer	Local authority E
Bruce	Headteacher	School in accessible small town in local authority E
Elizabeth	Officer	National agency and linked to the Northern Alliance RIC
Emma	Officer	National agency
Fiona	Lead Specialist	Northern Alliance RIC
James	Senior Officer	Professional Association
Ken	Depute Headteacher	School in very remote small town in local authority B
Kevin	Officer	National agency
Linda	Director	National agency
Mary	Senior Officer	Local authority B
Paul	Director	National agency
Peter	Lead Specialist	National agency and linked to the Northern Alliance RIC
Sam	Headteacher with system leadership role	School in large urban area in local authority G
Stephen	Depute Headteacher	School in other urban area in local authority D

Table 5: Leader participants

This research design has many elements in common with the description of case study research by Yin. Yin (2018, pp9-15) describes case study research as having a distinct advantage over other research methods when asking in-depth ‘how’ and ‘why’ questions about a contemporary phenomenon within its real-world context, and where boundaries between phenomenon and context may not be clear. Such case study research can be exploratory, descriptive, or explanatory in nature, or some mixture of all three, and I argue that this study has aspects of all three: an exploration and description of the views of teachers and leaders on the professional learning of teachers and using the evidence gathered from

across the study as a whole, explanations are sought which might be generalized more widely. Yin (2018, p15) also describes a case study as able to cope with a technically distinctive situation in which there are many more variables of interest than data points, benefits from the prior development of theoretical propositions to guide the design, data collection and analysis, and relies on multiple sources of evidence converging in a triangulating fashion to provide valid and reliable findings. Yin (2018, p16) also describes case study research as accommodating 'relativist' perspectives acknowledging multiple realities and findings that are observer dependent. There is little doubt that this study shares many of these features as it operates in a complex field with many variables, builds on a hypothesis developed from my previous study and experience, and draws upon evidence gathered from the perspectives of classroom teachers, and from school and education system leaders, as well as from the analyses of documents in an attempt to triangulate data and develop robust descriptions and explanations of the area of study.

The study as a whole can be considered to be a reasonably tightly bounded 'case study', both spatially and temporally, as it focuses on only the professional learning of teachers of a specific subject, with a minimum length of experience in state funded secondary schools in a particular geographical area of Scotland. Rather than considering the participants as a purposeful, non-probabilistic 'sample' that can lead to statistically generalisable conclusions it is preferable to consider them as a group of individual 'cases' within an overall multiple-case study and use abductive methods to identify patterns and trends which can be generalised from across the study as a whole (Yin, 2018, p38). This study can also be considered an 'instrumental case study' where a particular case is researched with the aim to give insight into a wider issue, i.e., professional learning of teachers in general, as well as being an 'intrinsic case study' providing a better understanding of the particular case studied, i.e., the professional learning of physics teachers in the north of Scotland (Punch & Oancea, 2014, p150).

In summary, the case is therefore reasonably well bounded giving a situation that can be researched in depth, in a real-life context, but recognising the complexity of the situation, and how the case sits within the wider Scottish education system. Case studies are recognised as appropriate for the study of 'how' or 'why' questions in complex situations and are particularly suited for investigating the decision-making aspects of this research as illustrated by Yin (1994):

"The essence of a case study, the central tendency among all types of case study, is that it tries to illuminate a decision or set of decisions: why they were taken, how they were implemented, and with what result." (p12)

Having set out the rationale for the general methodological approach the next section describes the selection of data collection methods.

4.6 Data collection methods

Being clear as to the purpose of the research and identifying and understanding the research questions for the study are key to then identifying data collection methods. To answer research question 1, see chapter 4.2, data needed to be collected from relevant policy documents. Research question 2 required data from teacher participants, and research question 3 from leaders across the education system, as well as from the teachers, to enable a comparison with the findings from research questions 1 and 2. As the study aims to develop a deep understanding of a complex situation the use of larger scale quantitative strategies such as using questionnaires to gather data from participants was rejected quickly. Questionnaires lend themselves to collecting descriptive rather than explanatory data and are more likely than other strategies to be misinterpreted or completed superficially by participants (Munn & Drever, 1990). The use of focus groups, with some structure provided by a semi-structured interview schedule, was given more consideration. Focus groups can provide high-quality, nuanced data with opportunities to follow up issues raised by the semi-structured questions (Drever, 1995, p2). The interactions between the group members can also help identify significant issues and common themes (Cohen et al., 2000, p288) and to provide richer and deeper discussions than can be the case during interviews with individuals (Robson & McCartan, 2016, p299). However, individuals with strong personalities can dominate discussions and power dynamics can influence the input from individuals within a focus group even with careful and sympathetic facilitation. There were also logistical considerations, and whilst it may have been possible to gather groups of physics teachers together in focus groups the likelihood of gathering groups of school senior leaders and system leaders together in suitable focus groups was highly unlikely. I also wished to avoid forming focus groups of participants with a significant disparity of backgrounds and experiences as this would increase the likelihood of certain participants influencing discussions and diminish the opportunity to probe more deeply into the specifics of the

professional learning journeys of all individuals. The social distancing restrictions necessary due to the COVID-19 pandemic at the time of conducting this stage of the study also meant that face-to-face focus groups would not have been possible, even if this data collection method had been thought desirable.

It was therefore decided that individual semi-structured interviews were the data gathering strategy most likely to best gather the deep and nuanced information desired. Using a semi-structured interview has the major advantages of allowing: interviewees to openly discuss the key issues in a confidential environment; an opportunity to determine underlying reasons for decisions, satisfaction or dissatisfaction; an opportunity to follow up unforeseen or unexpected issues; greater flexibility in asking questions than available when using questionnaires whilst still having an underlying structure, and relatively systematic and reliable analysis compared to open-ended interviews. However, disadvantages include: restricting the number of participants due to extensive work needed to transcribe the interviews and analyse the data collected; the possibility of biased sampling resulting in difficulty generalising conclusions; the over structuring of the interview by the interviewer could result in salient points being omitted or if the interviewer does not provide sufficient structure the responses may be difficult to analyse, and problems associated with arranging mutually suitable times for interviews for both interviewees and interviewer. Nevertheless interviews are well suited to the case study style approach described previously (Drever, 1995, p7).

In preparation for the semi-structured interview teacher participants were also asked to reflect on their professional learning and complete a roadmap of their professional learning journey up to that point in time. This roadmap was then used to help provide some of the structure during the interview itself. The interview was also used as part of the preparation of the teacher participants to complete a diary-log of their professional learning over a twelve-month period to provide opportunities to gather data beyond that possible during oral interview discussions. These techniques also provided opportunities to gather some quantifiable data on the frequency and duration of professional learning undertaken by the teacher participants. More open-ended and less structured interviews or the use of arts-based stimulus materials (Finley, 2012) to promote discussion were considered but it was determined that semi-structured interviews with the roadmaps and diary-logs were more likely to provide a focused structure to obtain the data desired, and to allow for consistent

and rigorous analysis. In addition to data gathered from interviews with practising teachers and leaders throughout the meso-level of the education system, an analysis of available policy documentation was conducted. More specific discussion of the data gathering for the different parts of the study and groups of participants is provided below.

4.7 Data gathering and analysis

4.7.1 Systematic analysis of policy

The expectations, understandings, values, practices, and behaviours of all the actors in the education system, are shaped by the policy environment in which they work. The term policy is itself contested, and can be interpreted as relating to a product, i.e., text and documents, or a process, i.e., discourse (Adams, 2016, p294; Ball, 1993, p10; Ozga, 2000, p2). However, even if conceptualised as a process, a view with which I largely agree, for most of the actors within the education system this occurs within the context set by national policy documents. Therefore, it is important in understanding the data gathered from participants and the professional learning practices of teachers to analyse the policy documents which shape teacher professional learning and professionalism. This analysis therefore addresses research question one. Policy documents are produced by governments and organisations as part of programmes to address 'problems', to maintain order, and/or to guide practice (Bacchi, 2009), therefore consideration was given to what 'problem' teacher professional learning might be trying to 'fix'.

What is the problem teacher professional learning is trying to fix?

Drawing on the work of Bacchi (Bacchi, 2009; Bacchi & Goodwin, 2016), the reasons for the policy focus on teacher professional learning was considered. In Scotland, as in many countries, there is a taken for granted movement to improve educational outcomes for children and young people driven by economic (Scottish Government, 2018c, p7), and to an extent health and wellbeing, reasons and to which the improvement of the quality of teaching is central (Barber & Mourshed, 2007; Mourshed et al., 2017). In Scotland this global phenomenon has been exhibited though a series of policy developments directly, and more obliquely, related to professional learning and/or to the professionalism of teachers, as is discussed in chapter 2.3. Writing in 2007 about the discourse of professionalism in Scottish professional learning policy, and following critical discourse analysis (CDA) of the literature

at that time, Kennedy described the dominant conception of professionalism as 'managerial' but that "*much of the contemporary literature reflects a desire to redress the balance and shift towards a more democratic conception*" (Kennedy, 2007, p103), but subsequently there was little or no progress (Kennedy et al., 2012). Similarly, following CDA of important policy documents since Kennedy's analysis, Watson and colleagues (Watson & Fox, 2015; Watson & Michael, 2016) describe a continuing mix of conceptions of professionalism being used in Scottish education. Building from such analyses, the systematic analysis of policy in this study draws upon a CDA approach. This includes an exploration of the use of the term professional learning, and related terms such as CPD and CLPL, and the conception of professionalism in the policy documents identified as relevant to shaping professional learning policy. The nature of the conception of professionalism promoted in documents can be determined by references to terms such as collaboration, collegiality, autonomy, agency, trust or empowerment which might imply a more democratic or transformative conception of professionalism, whereas references to scrutiny and accountability processes might imply a more managerial conception, however, the context and manner of the use of such terms and what might remain unwritten is always important to consider in any such analysis.

Identification of documents for analysis

The professional learning of teachers in Scotland is set within a national policy framework detailed across many documents and webpages produced by several organisations including the Scottish Government, Education Scotland, and the General Teaching Council for Scotland. Some of these documents have been produced following national policy developments or following tripartite negotiations between the national government, local authority employers, and teacher unions regarding the salary and conditions of service of teachers which include references to teacher professional learning. These are the policy texts which frame the discourse and resulting practice investigated in this study through the participant interviews, and provide the framework within which RICs, local authorities, schools, faculties and departments develop their own policy and implementation guidelines (Ball, 1993).

What teachers are contractually required to do is laid out in the Scottish Negotiating Committee for Teachers Handbook (SNCT, 2007). This is therefore an important starting point regarding expectations for teacher professional learning. It makes multiple references to the GTCS professional standards (GTCS, 2021b, 2021a) which apply to all teachers in

Scotland, and to Professional Review and Development (PRD) (GTCS, 2019) and Professional Update (PU) (GTCS, n.d.-e) processes. This led to a genre chain (Fairclough, 2001, p255; Hulme & Menter, 2011, p72) approach to identifying the relevant documents to analyse. This chain led from documents relating most directly to the individual teacher through schools to those with national and even international aspects, see figure 17.

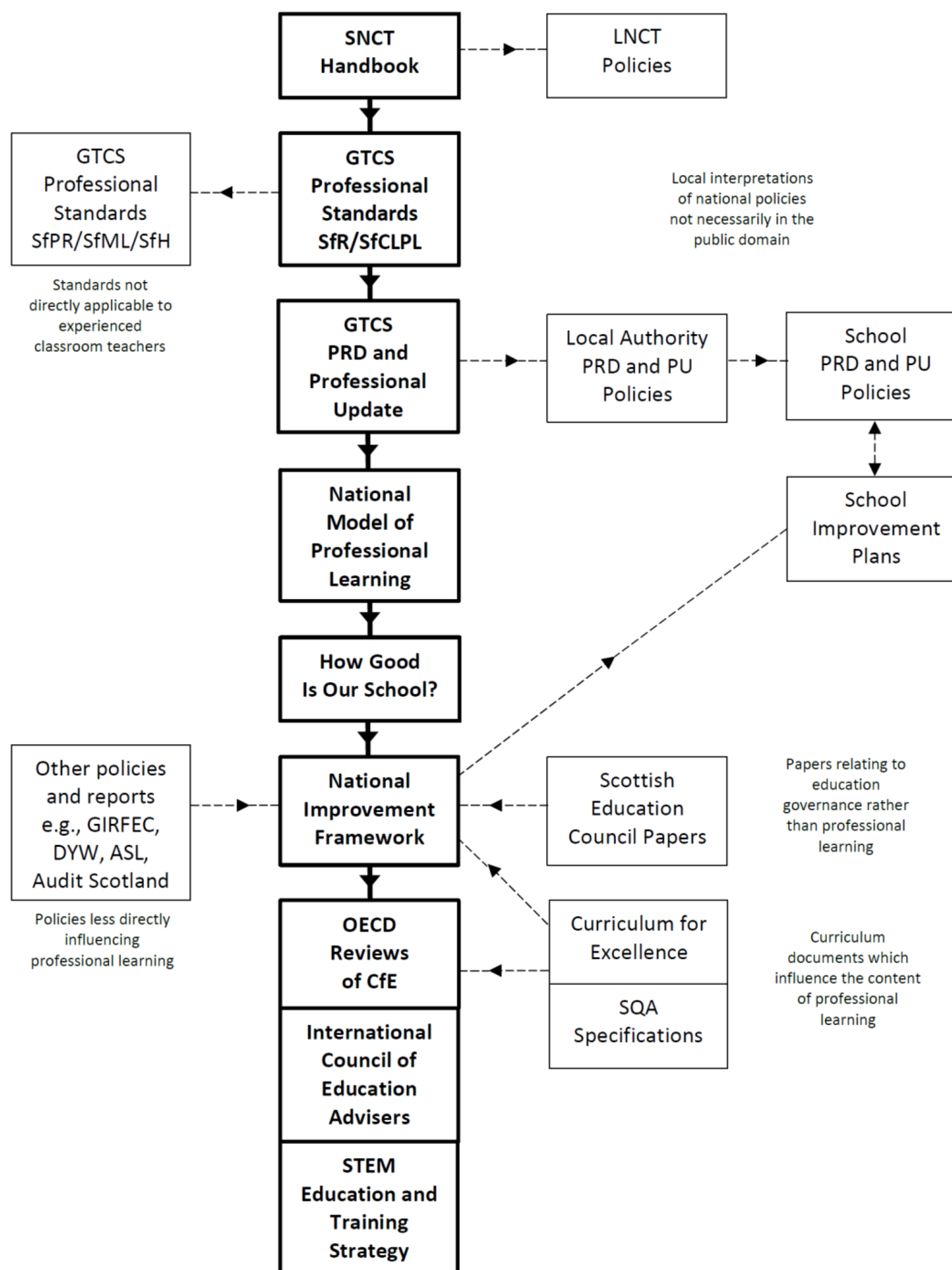


Figure 17: Genre chain of policy documents with links to some of the wider policy environment not included in the genre chain.

I also used my own professional knowledge and appropriate search terms such as professional learning, CLPL, continuing professional development, and CPD to check for any other documents important, in whole or in part, in determining policy in relation to the professional learning or professionalism of teachers in Scotland not identified through the genre chain process, and to check that those in the chain were still current. I restricted the analysis to reports and major policy documents, wholly or with a significant section relevant to teacher professional learning and/or professionalism, freely available in the public domain, and published or updated since 2015, with the exception of the Code of Professionalism and Conduct which still sits alongside the revised GTCS professional standards (GTCS, 2012a). This is partly due to the analyses of Kennedy and Watson and colleagues already having identified the conceptions of professionalism in relevant older documents. The more recent documents arguably have the strongest influence on current practice, and this limited the analysis to a manageable range of documents relating to professional learning policy and practice.

The minutes or notes of any available committee meetings of the organisations responsible for these documents were not included. This was partly to manage workload, but also such documents cannot be considered to be a complete and unbiased record of the business of the meetings. It is not possible to capture fully the tone of the exchanges involved and there is always a selection process involved in what is finally recorded. This will generally give some narrative privilege (Humes, 2020) to the secretariat of the meetings responsible for making the record, and following common committee procedures, the chair of any committee who normally approves minutes before they are circulated to the wider membership of the committee, let alone released to the public record. Nevertheless, the major reports and policy documents available in the public domain are the main documents shaping the policy environment for practitioners and a useful source of information to compare with the data from interviews. Documents on the topics which the professional learning of teachers might be about, such as curriculum developments, were not included. Analysis was conducted only on the parts of documents relevant to teacher professional learning and professionalism. I did not include any documents only available to teachers in specific local authorities due to them often being shared on restricted websites, such as Glow (Education Scotland, n.d.-c). As a final sense check, I identified the documents referred to by the participants when asked which policy documents they considered important in guiding professional learning policy

and practice. There was very good agreement as to which documents were relevant and those included in the analysis are listed in appendix 2 and illustrated in figure 17.

Approach to the documentary analysis

The approach taken draws upon critical discourse analysis (CDA) and was used to explore the discourse around professional learning in the policy documents. It is argued by some that CDA is not a research method but a research approach which combines a range of theoretical perspectives and some have argued for a move away from CDA to the term critical discourse studies (CDS) to better reflect this (van Dijk, 2013; Wodak & Meyer, 2015, p3). CDA is not without its critics, with some arguing it is interpretation and not analysis and is subject to the political biases of the researcher (Widdowson, 1995). Others advocating the use of CDA approaches acknowledge it is biased, being influenced by the experiences, views and politics of the analyst, but that a strength of CDA is that it openly recognises this and that it is a hermeneutic or interpretative process (Braun & Clarke, 2022; van Dijk, 2001; Wodak & Meyer, 2015). Policy has a cultural dimension and takes shape influenced by the historical and national context in which it is written and practised. Education policy, as a form of public policy, is generally developed by governments or policymakers through the development of programmes or initiatives to 'fix' a problem identified, or arguably generated, by those policy-makers (Bacchi, 2009). CDA is frequently used to explore the context and power relations in policy and practice settings. While CDA focuses on the use of language it considers the context within which the language is used. In doing so it explores not only what is said but how it is said, and what is not said, and both the explicit and more implicit messaging that results. To think critically about any subject, it is necessary to be knowledgeable about the subject and therefore it is an approach appropriate for insider research provided the researcher recognises the dangers that being steeped in a topic might bring in terms of not being sufficiently open to alternative conceptions and perceptions of the policy and the problematisation which has resulted in the policy. The approach taken includes features described in the CDA literature and is interpretative in nature, but the danger of straying from more objective analysis to more subjective opinion can be mitigated by the systematic use of an analysis protocol.

Documentary analysis protocol

The analysis of each document used the following questions, not all of which are relevant to all documents:

- Who has written the document?
- Has a range of stakeholders, in particular teachers, had an opportunity to input into the development of the document?
- What conception of teacher professionalism is stated or implied, including the use of terms such as collaboration, collegiality, autonomy, agency, trust and empowerment?
- Is a need for change in teacher professionalism stated or implied?
- Is the need for teacher professional learning justified and how does that relate to other aspects of the role of a teacher?
- What presuppositions and assumptions underlie the references to professional learning or teacher professionalism?
- What is left unwritten about teacher professional learning or teacher professionalism?
- Are teachers treated as the objects of professional learning or agents in their own professional learning?
- What power relationships are evident in references to teacher professional learning and teacher professionalism?
- What is said about the alignment of policy and support for professional learning in the meso-level of Scottish education?

The analysis of the policy documents therefore gave a baseline against which to compare the data gathered from the teacher and leader participants.

4.7.2 Teacher participants

Participant selection criteria

The teacher participants in the study are teachers of physics in Scotland whose role is predominantly classroom teaching. This includes unpromoted teachers of physics and curriculum middle leaders in schools, known in Scotland as principal teachers, and also in some schools as head of faculty or head of department. These middle leaders typically have a small number of additional periods per week of non-class contact time for administration

and leadership duties compared to the statutory non-contact time for all teachers, but this still means they spend most of their school-based time teaching. The 2020 Teacher Census (Scottish Government, 2021c) indicated that there were almost exactly twice as many male teachers teaching physics as female teachers (623 to 308) and when selecting the group of participants attempts were made to reflect this gender balance, although it proved more difficult to recruit female than male participants. These participants are members of the micro-level of the education system as defined in chapter 2.1.2.

I have been active in supporting and delivering professional learning and other professional activities within the Scottish physics teaching profession since 1986. Since 2003 I have had a support role for teachers of physics for the IOP (Institute of Physics, n.d., 2020a). As a result I am well known within the Scottish physics teacher profession and have gained extensive knowledge of it and very many of its members, and developed significant symbolic capital (Bourdieu, 1977), social capital (Hargreaves & Fullan, 2012, p90), and credibility within that professional community as a result. Throughout my career I have worked consistently to develop and maintain a high level of integrity and to be well-respected by colleagues and fellow professionals which places me in a favourable position to conduct such a study. I used my contacts and networks to recruit the physics teacher participants. An initial open call, in January 2021, for participants on an email forum to which most Scottish physics teachers subscribe resulted in no volunteers, perhaps not a surprise given the pressures on teachers to deliver remote learning and additional assessment requirements during the COVID-19 pandemic. I then targeted personal emails to teachers meeting the criteria of the study and who I thought would provide an appropriate range of participants. As someone involved in organising and delivering a significant amount of professional learning for the IOP, I avoided approaching those that had most frequently attended IOP professional learning activities during the previous two years, and purposefully approached several, although known to me, that to my knowledge had not attended any recent IOP professional learning activities to minimise possible biases. I used my knowledge of the Scottish physics teaching profession and my professional judgement to approach individuals likely to be reasonably knowledgeable about the professional learning landscape for physics teachers, likely to have well considered views on the matter, and to be willing to share these. This group of teachers of physics is therefore likely to be a 'best-case' group not fully representative of the Scottish physics teaching profession as a whole but much more likely to be able to contribute to a deep, well-informed exploration of the professional learning landscape, both within physics

and science education, and more broadly. This group was not selected as a representative statistical sample of all Scottish physics teachers but one that would likely yield useful analytical generalisations (Yin, 2018, p40). A hypothesised benefit of using this group of participants is that previous contact with me, an existing level of trust, and the individual approach, would more likely give greater ‘buy-in’ to the study which would lead to a reduced withdrawal rate of the teachers during the relatively demanding data collection process. Research into participation rates in longitudinal studies in medicine has shown that trust, regular contact and personalisation increase participation and reduce drop-outs (Abney et al., 2017; de Leeuw & Lugtig, 2015). However, there is a danger with me being known to the participants that they attempt to provide me with data which they think I want rather than more objective unbiased data. This was mitigated by repeated requests for honest and representative data during interviews and other communications.

Teacher data gathering and analysis process

To gain an understanding of their individual contexts and the experiences and understanding of professional learning of the teacher participants, a semi-structured interview was conducted with each at the start of the data collection phase, see appendices 3 and 4. In preparation for this interview each participant was asked to describe their professional learning journey to that point, this included asking them to construct a diagrammatical roadmap showing important activities, decisions and other events which shaped that journey, see appendix 5 for the roadmap template. Participants sent their roadmap to me before their interview which then allowed me to delve deeply into the experiences and stories of the professional learning journey of the participants and follow-up on interesting occurrences in a relatively open-ended manner whilst remaining within a broad framework. Extensive written notes were taken during the semi-structured interview. The interviews were video recorded and transcribed. Using a grounded, inductive approach (Robson & McCartan, 2016, p161), recurring themes were highlighted and coded. The information relating to each emergent theme was then collated and summarised. The information relating to the emergent themes was further collated and refined as the themes became more visible gradually building up a narrative describing the professional learning experiences of the participants (Braun & Clarke, 2022).

The semi-structured interview and mapping exercise, as well as gathering contextual and baseline information for the study was also designed as an important part of the induction and preparation of the participants for the subsequent part of the study where the teacher participants were asked to complete a diary-log of their professional learning during a twelve-month period, see appendix 6 for details of the fields and options. During the interview I was able to explore the definition and understanding of professional learning with the participant, particularly the nature of much of the informal professional learning which takes place in the workplace or around the more formal planned parts of many professional learning events or activities. It has been shown in previous studies (Eraut, 2012; Evans, 2019; Netolicky, 2019) that teachers often define professional learning in a rather narrow manner, associating professional learning with formal organised 'events' and do not recognise the informal professional learning that takes place 'on-the-job' and with colleagues. They also do not recognise informal activities taking place around and during formal professional learning events, or the professional learning that occurs due to significant 'life events' which might seem to be unrelated to the professional activities of the individual but nevertheless have a significant shaping effect on the professional growth of the individual.

The interview and mapping process was an opportunity to discuss the impact that informal activities and experiences have had in the professional learning journeys of the participants and therefore ensure that during the diary-log data collection process that the participants were more likely to recognise such professional learning activities when they occur and include them in their diary-log. Evans (2019, p13) states that such implicit and informal professional learning is largely invisible, neglected, and under-researched and this study is in part designed to address this gap and to gather data which gives a fuller and more rounded description of the professional learning experiences of a particular group of teachers and how these experiences have, or have not, impacted on their professional growth.

Drawing on experience and the literature, I identified fifteen different modes of professional learning and used these as a means of exploring the understanding and the experience of participants during the interview and in the diary-logs, see appendix 7. These were ordered in a rough hierarchy from informal discussions with colleagues through to more formal activities such as certificated courses, attending conferences, and coaching, and broadly following Kennedy's spectrum, see figure 6. Participants were encouraged to keep as complete a 'real-time' record of their activities as possible. To make it relatively easy for

participants to identify and record each professional learning activity they undertook during a full twelve-month period in their diary-log, these modes were provided in a drop-down menu in the diary-log spreadsheet. There were also fields on the diary-log for participants to enter the duration of each activity and the location where it occurred. For each activity the participants were asked to rate it using a four-point Likert scale, from 1 – not at all useful to 4 – very useful, in the style used frequently by many immediate post-activity evaluations, plus space for a brief justification of this score. However, as described by Guskey (2000, p9), such evaluations are superficial and only provide information on the initial reaction of participants to the professional learning and do not provide any indication of impact, whether that be longer term professional growth in the individual or changes in classroom practices impacting on the learning of pupils. In an attempt to establish if a professional learning activity did have a worthwhile impact the participants were asked to revisit each entry in the diary-log after a period of around one to two months and again at the end of the twelve-month period covered by the diary-log, to reflect on any impact or changes resulting due to each professional learning activity, and to enter comments accordingly. This process was designed to allow richer data on the impact of the professional learning activities to be gathered but is also consistent with the sort of reflection on learning promoted by the GTCS professional standards (GTCS, 2012b) and other professional recognitions such as CSciTeach (ASE, n.d.-b).

I was able to monitor the diary-logs of the participants and sent occasional ‘keeping in touch’ emails in part as a prompt to remind participants to complete their diary-logs, particularly for the more informal or implicit professional learning, but also to help prompt reflection on the impact of the professional learning the participants had experienced.

Pilot teacher participant

To test the proposed data gathering process I decided to conduct a pilot teacher interview before embarking on the main data collection of the study. This interview was conducted in the manner expected for future interviews but with an added element of then asking the interviewee to provide feedback on the process used, the semi-structured interview schedule and other documentation, and generally whether he considered what was being proposed was a reasonable ask of a teacher, and feasible for a teacher to complete. This pilot was conducted for several reasons, first to allow my supervisors to check the video recording and

transcript produced to ensure the interview was conducted in an appropriate and ethical manner, such as me avoiding leading questions or other behaviours which might bias the data obtained. Second, it allowed me to test the appropriateness of the documentation and the conduct of the interview to review and improve the process before the main data collection stage began. It also provided basic information, such as the likely duration of the interview, which could then be used to better inform potential future interviewees of the likely demands on their time when participating in the study.

I approached an experienced teacher, Calum, well known to me and with whom I had worked on projects previously, and who had participated in my previous research conducted as part of my MSc in Teacher Education. Calum was someone I was confident would give me honest feedback and tell me if I was attempting to do something which was unreasonable for teachers to complete. As Calum had already had a relatively long career in teaching it would also test how reasonable it was to ask someone to reflect and remember events, activities, and incidents over a period of several decades. Calum agreed willingly to take part.

I emailed Calum a Consent Form, Participant Information Sheet, Semi-structured Interview Schedule, and written instructions asking him to construct a roadmap of his professional learning journey. I did not provide him with an exemplar roadmap as I was interested to see what someone unfamiliar with the concept would come up with themselves. I did not want to overly constrain participants' approaches to reflecting upon and documenting their professional learning journey by steering them down a particular route. I asked Calum to identify a suitable date and time to conduct the online interview and he identified a time around two weeks later. I was content with this arrangement as it would give him time to reflect on his professional learning journey and construct his roadmap.

Lessons learned from the pilot

Calum did not construct and send me a roadmap of the type anticipated. Calum sent three documents which were simple lists of professional learning events he had attended during different periods of his career. Although these were quite extensive in nature, Calum having participated in a significant amount of professional learning over the years, the lists only gave the date, title of event, name of provider, and a single word or short statement in way of evaluation such as "very useful", "satisfactory", or "a very worthwhile day networking with colleagues". The third of these documents was a printout of his professional learning record

from his local authority system for recording professional learning as part of its PRD process. This listed a total of 95 events over the most recent six years of Calum's career. Other than the short, immediate post-event evaluation statements there was no indication, other than some being listed as "excellent" or "very worthwhile" as to which had been most beneficial to Calum's professional growth, and no longer-term reflection on whether these events had resulted in any significant change in Calum's practices, beliefs or attitudes. It was immediately clear to me that if I were to obtain the deeper or more nuanced information about which professional learning had led to professional growth in the way I had envisaged when designing the methodology, I needed to provide much clearer guidance to the participants, including some exemplars illustrating possible types of roadmaps, and the details they might include.

A second aspect also completely missing from the information provided by Calum was any acknowledgement of him participating in any form of informal professional learning. The fact that some of Calum's evaluation comments referred to attending specific events as being beneficial due to the networking opportunity involved, rather than the formal content of the event itself, indicated that Calum was likely to be participating in informal professional learning. However, it was clear that Calum was applying a narrow and rather transactional definition of professional learning to his record keeping. As I know Calum well, I was confident that he was participating in a much wider range of professional learning than that represented in the documents provided such as private reading and research, collaboration with colleagues, as well as much informal discussion with colleagues and others. I also know Calum is a highly respected and regarded physics teacher many less experienced colleagues turn to for advice and this involves him in much informal discussion of teaching and learning issues which no doubt also has benefits for his own professional learning. This range of activity was one of the reasons I identified Calum as a suitable individual with whom to conduct the pilot.

The failure of the roadmap activity to operate as intended led to the development of two roadmap exemplars, see appendix 5. The first exemplar was constructed for a hypothetical physics teacher with around eight years of experience and based on a design provided by one of my supervisors. The second was based on my own professional learning journey covering forty years and was quite extensive and complex. Although there was a risk of this exemplar being somewhat daunting for participants, I hoped the range of different activities and events

it included would act as a good prompt for participants. In addition, I hoped it would make a wide range of examples with which I am very familiar visible to the participants and to which I could readily refer to during interviews if an illustration, analogy, or specific example was required to aid discussion of the participants' experiences. For example, in addition to specific events such as conferences or academic study my roadmap includes individual workshops where I can remember having 'ah-ha' moments that led to me changing my practices and beliefs; times when I first met specific individuals with whom I subsequently collaborated with significant impact on my professional learning, and times when I had significant discussions or collaboration with colleagues.

The first two questions on the semi-structured interview schedule were also reworded to provide a better first 'settling in' question where I asked the participant to give a brief description of how they got into teaching and their career to date. This would ensure I obtained some potentially significant background and contextual information about the participants as this can have a significant bearing on their career-long professional learning needs. Physics teachers can have a range of first degrees such as engineering, applied maths, astrophysics and geophysics as well as more 'pure' physics degrees. A teacher with an engineering degree is likely to have a greater need for professional learning on some of the more modern aspects of physics recently introduced to Higher and Advanced Higher physics, such as cosmology or particle physics, than someone with an astrophysics degree for example. The second question was reworded due to the changes to the roadmap instructions to focus on more important specific examples of professional learning that the participants valued highly and considered to have more impact on their professional growth.

Whilst the content of question four on the semi-structured interview schedule was not changed it was decided that converting the format to a live, interviewer completed questionnaire would be a better means of collecting the data which also gave the potential for a small amount of quantitative analysis. The important role of question four in helping the participants to understand my definition of professional learning activities, particularly the emphasis on including informal activities appeared to work well. This was an important training step to help ensure participants subsequently completed their diary-log as desired and was shown to be a necessary stage given Calum's narrow working definition of a professional learning activity. The demonstration and explanation of the diary-log online spreadsheet that was done at the end of the interview also appeared to work well. Calum

thought that the diary-log would be straightforward to complete and very similar to his local authority PRD log, which he had provided as part of his roadmap documentation.

The pilot interview also highlighted the need for me to be a little more focused and less conversational when asking the starter questions ensuring I asked each question more coherently and clearly and then being more direct and probing in asking appropriate supplementary follow-up questions. The fact that I knew Calum so well may have been a factor affecting this aspect during the pilot interview as was my desire to try and put participants at ease.

The transcription of the interview was made by editing the automatically generated Zoom transcript, but this proved to be quite time consuming due to frequent errors, possibly being due to the Zoom software being unfamiliar with Scottish accents and significant educational jargon being involved. I decided to see how accurate future Zoom transcripts were before deciding whether this method was better than typing straight from the recording.

Due to the changes described above I decided not to include Calum in the main sample of data gathering for the roadmap and interview stages of this study. However, as the pilot interview did not lead to any changes in the plans for use of the diary-log or any subsequent stages of the study, Calum has been included in the study alongside other participants for these parts. A summary of findings about Calum's professional learning journey is given separately from the reporting of the findings from the subsequent participants in chapter 5.3.

Teacher participant selection process

Following the pilot, I approached seventeen teachers by email. One teacher did not respond to either my initial request or a reminder. Three responded that whilst they were supportive of my research in principle that due to pressures on their time due to caring responsibilities, and the increased workload during the COVID-19 pandemic that they did not wish to participate. One teacher responded positively to my initial request to participate, also stating that caring duties and workload were a potential problem but did not respond further until after data collection from other participants had been almost completed. One teacher requested a significant delay to participation giving the increased workload due to the additional pupil assessment requirements during the COVID-19 pandemic as the reason. This

resulted in eleven teachers, in addition to the pilot teacher, participating in the roadmap exercise and an interview via Zoom. One of these participants, Ava, documented nine professional learning activities in her diary-log in a six-week period immediately following her interview but subsequently withdrew from further aspects of the study, also quoting workload issues due to the pupil assessment requirements during the COVID-19 pandemic as the reason for doing so. The data Ava provided in her roadmap and initial interview were included in the study.

The participants interviewed taught in a good range of different sizes of schools spread across a wide geographical area in seven of the eight local authorities of the Northern Alliance. Three were female and nine were male, five held principal teacher roles and seven were unpromoted teachers. Whilst all were GTCS registered to teach physics, six also taught other subjects in the Senior Phase. Although not attempting to obtain a statistically representative sample of teacher participants I was nevertheless content with the range of participants for the purpose of this study. Details of the participants are given in appendix 8.

Analysis of roadmaps and initial interviews

Initially I had hoped that the roadmaps provided by participants might be treated as a separate diagrammatical and visual data source, however, the widely varying formats and level of detail provided by participants meant that this was not possible. The roadmaps provided included simple lists and spider diagrams of events and a few more detailed maps like the exemplars provided. Asking participants to complete a roadmap was nevertheless a beneficial exercise as it helped prompt and structure their thinking about their professional learning journey both before and during the interview and provided me, as interviewer, a structure for discussing the professional learning they considered impactful. The interviews were recorded and transcribed, and this transcription became the primary data source for analysis, although the roadmaps and handwritten notes taken during the interview, both being a form of 'highlights', were used as a cross check against the themes identified from the transcriptions. By both conducting and transcribing the interviews this increased my familiarisation with the data (Braun & Clarke, 2006, p87).

NVivo was used to code the transcriptions and to identify themes comprising constituent expressions. Some of the initial themes identified could be described as a priori themes as they were linked to specific questions in the semi-structured interview schedule, which

themselves were informed by the literature and previous experience. However, some also emerged from the data, and the a priori themes were also clarified, using a more inductive approach (Ryan & Berrnard, 2003, p88). The themes emerged somewhat organically during the reading of the first few interview transcriptions. Most themes emerged rapidly on the first reading of the transcripts due to frequent repetitions across multiple participants. A reflexive constant comparison method was used to add expressions to these themes on subsequent readings of the transcripts particularly identifying similarities and differences across the different interviews, revisiting transcriptions as themes emerged and evolved (Braun & Clarke, 2022; Ryan & Berrnard, 2003, p91).

As people speak they never say all that they mean (Gee, 2014). As the teacher participants were speaking to me as an insider researcher very familiar with both physics teaching and professional learning for teachers of physics, there was sometimes an element of participants leaving out or making assumptions about information that 'all Scottish physics teachers would know'. However, being an insider, I was able to pick up on features which might not have been immediately transparent to an independent outsider reading the verbatim transcripts. This is consistent with the observations of Kezar et al. (2018, p840) who described only being able to better understand and interpret interview data once they had experienced community of practice events with the participants.

The transcripts were also read through again with particular focus on the sections which had not been coded into any of the themes previously to see if any new or less obvious themes emerged from these sections (Ryan & Berrnard, 2003, p93).

Analysis of diary-logs and follow-up interviews

The diary-logs were analysed to determine the extent and frequency of professional learning recorded by the participants. Simple quantitative analysis of activities was undertaken, including analysing separately activities undertaken within the teachers' Working Time Agreement, such as in-service days and other collegiate working, as opposed to during the 35 hours of more personal professional learning. In addition, and in a similar manner to the analyses of the interviews, a grounded, inductive approach was used to identify recurring themes which were then highlighted and in an iterative process collated and summarised to determine findings. This included what professional learning teachers considered to be of greatest value and most beneficial to their professional growth and improving their practice.

It also included identifying professional learning which had been less beneficial and how these activities might be improved, and the barriers which prevented or frustrated them from reaching their professional learning aspirations.

The initial analysis of each professional learning diary-log was then used as a starting point for a follow-up, semi-structured interview with each teacher participant, see appendix 9. This interview was intended to probe into how complete each diary-log was, and to gather further information on the impact of the professional learning experiences, particularly as this may take some time after the professional learning taking place before its true impact manifests itself in changed practices and/or beliefs. The extent of this second follow-up interview was partly determined by the quality of the data recorded in the diary-log, particularly the quality of the reflection on impact it contained. During the leader interviews, which took place during the period between the teacher initial and follow-up interviews, leaders indicated that teachers ought to be making greater use of policy documents than appeared to be the case from the initial teacher interviews. The follow-up interviews were therefore used as an opportunity to investigate teachers' use of policy documents and to gather some simple quantitative data on this. Notes were taken during these interviews, which were also video recorded, transcribed and analysed using similar methods to the initial interviews.

Once expressions had been extracted from all the teacher interview transcripts into themes these were reviewed. Some themes were amalgamated, such as 'collaboration with colleagues' with 'working with colleagues', where insufficient differences existed, and related themes grouped together, see appendix 10. New themes which emerged in the follow-up interviews were added to those from the initial interviews. Expressions which might make particularly suitable participant quotations were also identified at this stage.

The data gathered from the diary-logs and interviews were also analysed against Kennedy's framework, figure 6 in chapter 3.2.2, Timperley's principles, table 1 in chapter 3.2.3, and the enquiry-based professional learning model, figure 16 in chapter 3.7, which was synthesised from literature on professional learning. These were used to determine the likely overall quality of the professional learning experiences of the teacher participants, how transformative these experiences were likely to have been, and whether there was evidence of enquiry as stance being practised.

The process outlined above was designed to generate a deep understanding of the professional learning landscape of the teacher participants. Their experiences are shaped by the environment in which they find themselves which is significantly facilitated and controlled by those in the meso-level of the education system as they have line-management roles and influence the professional culture and ethos of the institutions and organisations within which teachers work. Therefore, this study also sought to gain the views on the professional learning of teachers from participants in the meso-level of the education system.

4.7.3 Leader participants

Leaders were interviewed from various organisations across the meso-level of Scottish education. However, these leader participants can be subdivided into two broad categories: senior leaders within schools, and leaders within local, regional, or national organisations.

Leader participant selection process

I wished to have all the main types of organisations with a role in teacher professional learning represented in the leader participants interviewed together with staff working at different levels within organisations. This included staff at the national agencies of the Scottish Government Learning Directorate, Education Scotland, General Teaching Council for Scotland, SSERC, and a teacher professional association, plus the Northern Alliance RIC, local authorities, and several headteachers and depute headteachers. Details of the participants are given in appendix 11. Using a similar strategy to that which I had used to recruit teacher participants I emailed fourteen people, and all agreed to be interviewed. I was very pleased with the range of participants for the purpose of this study. As all fourteen participants already knew me, there could be a disadvantage of them biasing responses to those they considered I would prefer or by them avoiding potentially contentious issues they thought might have been a particular interest to me. However, I hoped that my previous efforts to maintain integrity and respect in my work would mean that this would be minimised, and our familiarity would allow me to quickly probe into the relevant issues during the interview in a climate of trust and open-ness which would allow good quality discussion.

School senior leader participants

The participants in this group were headteachers and depute headteachers in Scottish secondary schools. They may have had a small teaching timetable, but most of their work was in a non-teaching capacity. In managing and leading schools, they had an important decision-making role regarding much of the professional learning undertaken by the teaching staff in their school. As defined in chapter 2.1.2, these participants were in the meso-level of the Scottish education system but were those most directly in contact with the micro-level, i.e., teachers. As with the selection of the teacher participant sample the school senior leaders were selected in a purposeful manner as ones likely to provide well-informed views about the professional learning of the teachers in their school. I included two depute headteachers and two headteachers in the sample but three of the system leaders had recently been heads or deputes in schools in the Northern Alliance and frequently answered questions from this perspective during their interviews.

Semi-structured interviews were conducted with the school senior leaders, see appendices 12 and 13. Extensive written notes were taken, and the interviews video recorded and transcribed. The interview starter questions were designed to explore what the senior leader thought typical professional learning journeys were like for teachers and how, as a leader and decision-maker, they supported these professional learning journeys. This included an exploration of the purposes of the professional learning made available to teachers, their expectations of teachers engaging with and shaping their professional learning, and the modes of professional learning used to achieve these purposes. The interviews also included starter questions regarding the ideal professional learning provision for teachers in their school, what barriers and restrictions might exist which prevent the reality of the professional learning provision matching the ideal professional learning provision, and how policy helps shape the professional learning. The data from these interviews were analysed in a similar inductive manner to those with the teacher participants to identify common themes and key messages, but also significant individual events or occurrences which might be of particular value.

Senior leaders in schools, particularly headteachers, have significant autonomy and influence on their schools (Education Scotland, 2020a; Jones, 2018) but they nevertheless work within the wider frameworks provided by local authorities, regional improvement collaboratives,

and national policy and agencies. I therefore also included data gathered from other participants involved in the facilitation of, and support for, the professional learning of teachers from those organisations within the meso-level of Scottish education.

Participants from local, regional, and national organisations

The provision of education is delegated by the Scottish Government to local authorities therefore local authority officers, such as Quality Improvement Officers, have a role in the provision of professional learning to teachers. Since 2017, the regional improvement collaboratives and regional teams within Education Scotland, have been developed to allow co-ordination, particularly for the professional learning of teachers, across groups of local authorities. Therefore, several system leaders working in those organisations in the meso-level were interviewed together with a few in senior roles in national agencies that were arguably working in the macro-level as well as the meso-level. These system leaders have influence over the professional learning support and culture for a significant number of staff across many schools, and their views and approach to professional learning can therefore have a significant impact on the wider education system. As with the selection of the teachers and school senior leaders they were selected in a purposeful manner as ones likely to provide a well-informed view about the professional learning of teachers. People are more likely to share information if they perceive the research being conducted to be of value and if they consider the research is being conducted in a valid, reliable and credible manner (McPherson & Raab, 1988) and I was pleased that I was able to reassure participants with information about my methodology and measures to maintain the anonymity of all participants. The conduct, starter questions, and analysis of these interviews was the same as that used with the senior leaders in schools.

4.8 Ethical considerations

Following ethics guidelines (British Educational Research Association, 2018, p9), and after gaining approval from the School of Education Ethics Committee, all teacher and leader participants were provided with a letter providing information about the purpose and nature of the study, including the right to withdraw from the research, together with a consent form. Reassurances on maintaining confidentiality and anonymity of participants in the thesis and any reports, papers, or presentations based on the study were given with the hope that this would further increase the 'buy-in' of the participants, increase the likelihood they would see

it through to the end, and encourage full and honest contributions. This was particularly important for the teacher participants who were asked to complete the significant undertaking of the roadmap exercise, the diary-log and two semi-structured interviews. As this study takes a case study approach with a relatively small number of participants, care was taken to anonymise all participants by using pseudonyms. The aim was to always maintain the anonymity of participants in all reports or papers resulting from the study. However, as some of the system leaders interviewed held relatively unique positions within Scottish education this was potentially difficult in some cases. To minimise the risk to the individuals concerned, the interview transcripts were shared with each participant for checking and they were given the right to remove from the record anything they were not happy with being subsequently quoted or shared in the thesis or elsewhere. None of the teacher participants asked for any changes to their interview transcriptions and only two of the leaders asked for a small number of typographical errors and minor clarifications to be made indicating a high level of satisfaction in the interview data collection process. All participants were reassured that any specific mentions of individuals, institutions, or locations would be anonymised in any published works. On this basis, informed consent was given by all participants for the use of their data in the study.

That participants were relatively well known to me, and me to them, and recruited through my networks is acknowledged. The participants were not selected to form a representative statistical sample but as people well placed to provide well-informed, nuanced information about the professional learning of teachers whilst nevertheless representing a broad spectrum of schools, organisations and agencies within the bounds of the case. Such a selection was made to minimise any disproportionate influence from any one group of participants.

As can be seen from my experience described in the introduction, this study was embedded in a community with which I am very familiar, to which I have good access, and in which I have significant credibility due to my long and active participation and contribution to it. Throughout my career within this community, I have striven to maintain a high level of integrity and to maintain respectful relationships. As a member of this community this means there is an ‘insider’ element to the study which brings several advantages. I brought a great deal of knowledge and understanding of the Scottish education system, physics education more specifically, and professional learning in physics and science. This gave me

a good understanding of the context of the teacher participants involved and the ability to understand readily, and interpret effectively, the data provided to me. My work context gave me good access to appropriate participants, and it was therefore relatively easy for me to access a convenience sample of participants who also brought appropriate and relevant experience to the study. However, being an insider comes with potential disadvantages such as introducing an element of bias, subjectivity and potential vested interests where care must be taken to ensure objectivity, consistency and rigour in the conduct of the research (Greene, 2014).

However, there is also an 'outsider' element to me conducting the research. Therefore, I might best be described as a 'partial insider' sharing some identities with participants but also retaining a degree of distance from them (Chavez, 2008, p475). As an employee of the Institute of Physics; a well-regarded and respected professional body, and having worked latterly in a Scottish independent school, it also means I am somewhat of an 'outsider' to the local authority governed education system. I am also something of an 'outsider' when it comes to interviewing school and system leaders about professional learning policy and its implementation as, despite my extensive professional activities, I remained predominantly a classroom teacher throughout most of my career and am now an employee of a 'third sector' professional body working outwith the main structures of Scottish education. By conducting the study under the umbrella of the University of Strathclyde this also provides an element of independence from the participants, organisations and structures being investigated. This is an advantage in terms of encouraging participants to give open and honest responses to questions. Care was taken to minimise the potential biasing impacts of power relationships and of participants providing answers which they thought I would have liked to have heard. I consider my good standing within the profession but reasonably independent stance from it, both through conducting the study through a university as well as being employed by a third-sector employer, was an advantage in this regard. I conducted a pilot interview with a teacher participant which was video recorded and analysed by my supervisors to check on its ethical conduct, avoidance of leading questions, or use of inappropriate language. Lessons learned during the pilot interview were used to improve the interviews conducted during the study.

Participants were interviewed only after the study had been explained to them and their full consent given. All interviews were conducted using video conference software as this

allowed the use of automatic transcription software on a secure platform. The COVID-19 pandemic made the use of video conferencing more straight forward than had been anticipated at the beginning of the study due to the increased familiarity of all participants in using such technology. This also had the benefit of reduced travel time, costs and emissions. However, the conduct of interviews using video conference software had the disadvantage of reducing the immediate visual communication through body language and clues of any potential distress or discomfort on the part of interviewee compared to a face-to-face interview setting. Nevertheless, video conference software provides at least some visual communication which is not possible with purely audio interviews by telephone, the alternative for interviews conducted remotely. If there had been any signs of distress or discomfort, I would have immediately taken action to address this or if necessary to end the interview. I ensured that interviews were only conducted with interviewees at a time convenient to them and when they were in a suitable venue which they were confident provided the necessary security and confidentiality for the conversation, were comfortable for an interview of the required duration, and had a good broadband and wi-fi signal to enable a reliable video recording.

The initial design of the study anticipated a face-to-face discussion of each teacher participant's roadmap as the beginning part of the initial semi-structured interviews with the teacher participants. This would have allowed the teacher and me, as interviewer, to use the roadmap as a common focus for discussion. With the use of video conferencing software each teacher participant was asked to email me a high-resolution photograph of the roadmap ahead of the interview. We could then both have the roadmap visible during the subsequent discussion as would have been the case in a face-to-face interview.

The diary-log completed by the teacher participants consisted of a Google Sheets spreadsheet, see appendix 6 for details of the fields and options included. Several of the fields in the spreadsheet consisted of drop-down menus to assist participants with its completion. The only people who were able to access each spreadsheet were the individual teacher participant and me, with my supervisors able to access on request for monitoring purposes only. This ensured the data supplied by each participant remained confidential throughout the study but allowed real-time monitoring of activity enabling me to send personalised and targeted 'keeping in touch' messages and reminders to complete entries and reflections on impact if there appeared to be a lack of activity. This process allowed me

to maintain regular contact with the participants and offer support to try and sustain continued participation of the teachers throughout the year of their involvement in the study. The full completion of the diary-log was potentially a considerable ongoing undertaking for teacher participants. However, the nature of the data being collected was very similar to that expected of teachers completing their PRD and Professional Update (PU) processes required of all teachers in Scotland to remain registered as a teacher with the General Teaching Council for Scotland (GTCS). It was intended from the outset that completing the diary-log would generate data which could be easily cut and pasted from the diary-log spreadsheet into the online system used by each teacher for their PRD and PU and therefore not increase significantly the workload of the teachers. Completing the diary-log was therefore seen as less of a chore, or at least no worse than a neutral activity, and perhaps even an incentive for some participants.

The extent of the follow-up semi-structured interview with teacher participants largely depended on the extent and detail of the information they provided in their diary-log. If good detail of the impact of their professional learning had been recorded in the diary-log a fairly ‘light touch’ follow-up interview was anticipated. If less extensive details had been recorded this was explored more fully in the follow-up interview. My aim throughout the study was to make the process as painless as possible for the teacher participants and to ensure that they felt encouraged and supported when completing their part in the study. Participants, as has been reported elsewhere (Farmer, 2018; Netolicky, 2019), indicated that taking part in the study was itself a worthwhile professional learning experience and gave them an incentive to reflect on their practice in a manner they had infrequently taken the time to do in the past. This indicated there were no serious ethical problems around coercion or abuse of power in relation to teacher participation in the study.

All policy documents analysed were freely available in the public domain removing ethical issues which might have occurred if local documents not in the public domain had been included in the analysis.

Despite attempts to ensure the highest ethical standards were maintained and participants encouraged to participate fully in the study there were nevertheless limitations in the design and conduct of the study. These are explored in the next section.

4.9 Limitations of the study

As much of this study is qualitative it could be subject to criticism in relation to reliability, validity, rigour and credibility. However, those most likely to do so would be advocates that credible research ought to be of a more traditional scientific nature, such as randomised controlled trials testing explicit hypotheses in a quantifiable and positivist manner (Robson & McCartan, 2016, p21). However, research can only be credible if the methodology is appropriate to the nature of the study and its research questions. In this social sciences study, which seeks to determine understandings in a complex field, the definitions of reliability, validity, rigour and credibility are different to those that might be applied to more traditional scientific investigations in the physical sciences. In this study, data are collected through interviews with teachers, from roadmap and diary-log documentary evidence from teachers, from interviews with leaders across the education system, and from documentary analysis of policy documentation from national sources. Together these provide a range of different types of data and an element of triangulation to address issues of trustworthiness in the data.

The case study style of methodological approach used can be seen to have some weaknesses. I attempted to include a reasonably large number of individual cases of both teacher participants and leader participants which generated a substantial amount of interview transcripts and other documentary evidence, but this nevertheless only provided a snapshot of the experiences of professional learning for a few teachers and leaders. This data was not a balanced statistically representative sample from which generalisations could be made easily (Yin, 2018, p40). Working with a small number of participants therefore raises potential issues around selection bias and interviewer bias, especially as I have worked in the field of physics teacher professional learning for some considerable time. Working so closely with an issue with which I am so familiar, and with which it could be said I have a vested interest, could make me 'blind' to issues which someone further removed and independent from the field might be able to see more easily. Having been aware of this as a potential issue from the outset I have consciously worked to address this issue throughout the study, including taking a consistent approach to all interviews, taking written notes during interviews to cross-check with transcriptions, attempting to practice reflexivity, and to maintain an appropriate level of distance during the data gathering and analysis process (Greene, 2014, p9), but some unconscious biases very likely still remain (Royal Society, 2015a,

2015b). Any potential weaknesses of this nature will likely have been offset by the benefits that my knowledge and familiarity as an 'insider' will have brought to the study.

The teacher participants in the study were selected using my professional judgement to include people with a reasonably broad knowledge of the professional learning landscape in Scottish education. They were selected to allow me to probe deeply into the 'how' and 'why' questions of professional learning and I therefore sought participants that I was reasonably confident would be able to provide such insights. I also wished to ensure that there were teachers from a range of different school settings across the majority of the eight different local authorities included in the study. This process could easily have been subject to unconscious biases regardless of my attempts to ensure transparency and objectivity. It would have been desirable to have been able to include the relevant depute headteacher or headteacher with responsibility for professional learning in each of the schools in which a teacher participant worked to also gain the leadership perspective of professional learning practices and opportunities in each of these schools, and to compare these with the views of the teachers. However, to have done this, and to have also included the same spread of system leader participants to provide data from across the meso-level of Scottish education, would have greatly increased the total number of participants. As I wished to investigate the alignment of policy and practice through the education system, I consider the range of participants selected as being suitable for this purpose. Selecting matched pairs of teachers and school leaders might also have skewed the selection of both sets of participants as the number of schools where there was both a willing and suitable teacher participant and school leader participant may have been limited.

In attempting to narrow down some of the variables and give clear bounds to the study I focused on the professional learning of physics teachers with several years of teaching experience and who were teaching in a state funded secondary school in the Northern Alliance, only one of the six regional improvement collaboratives (RICs) in Scotland. The Northern Alliance is the most rural of the RICs with the majority of the most remote schools in Scotland (Northern Alliance, n.d.). It could therefore be argued that teachers in the Northern Alliance might have particular issues with regards to easy access to various services, including professional learning activities; an issue identified in my previous research (Farmer, 2018). However, that research was done prior to the COVID-19 pandemic which has increased greatly the use of online and video platforms for professional learning activities.

This move online has improved the equity of opportunity and access to such activities for teachers in more remote areas. Excluding teachers from independent schools as participants in the study and focusing only on teachers in state funded secondary schools is likely to have had a minimal impact on the study. Only 4% of school pupils in Scotland are educated in independent schools (Scottish Council of Independent School, n.d.) and there are only six independent secondary schools, including five relatively small schools, within the Northern Alliance area compared to 91 state funded secondary schools. As the governance of independent schools is by definition independent from the state, education system leaders are wholly or almost exclusively involved with the state funded education system, its schools, and teachers. Scottish education remains dominated by state funded schools governed via local authorities (O'Brien, 2011, p778).

The focus on physics teachers, i.e., teachers registered as teachers of physics with the General Teaching Council for Scotland, as well as to reduce variables was largely driven by convenience factors given my own background. The subject(s) for which teachers are registered to teach contributes significantly to the identity of teachers in Scottish secondary schools, further strengthened by the administrative organisation of schools into departments or faculties (Brooks, 2016; Siskin, 1994). Whilst the place physics teachers hold within the structures of secondary schools, and support and advice from local authorities, RICs, national agencies, and national government may be very similar to that for teachers of other subjects in secondary schools there may be differences which make generalisations in terms of teacher professional learning problematic. Physics, as one of the science, technology, engineering and mathematics (STEM) subjects, has benefited from recent initiatives such as the Scottish Government's STEM Education and Training Strategy (Scottish Government, 2017b), longer term professional learning support from SSERC, the Scottish national support agency for science and technology education (SSERC, n.d.), and from relatively strong and longstanding professional bodies including the Association for Science Education (ASE, n.d.-a) and the IOP (Institute of Physics, n.d.). Although there are professional associations for most subjects taught in Scottish secondary schools which organise annual conferences, online fora, newsletters, and other activities to support the professional learning of teachers of a given subject, unlike SSERC, IOP and ASE few have the resources to employ staff or the capacity to provide an extensive programme of support activities. As I am one of these employees my selection processes for the teacher participants may well have privileged teachers who have engaged more extensively with IOP organised professional learning

activities than activities organised by other bodies, however, this was something I was conscious of and with which I tried to be as objective as possible.

The selection of school and system leader participants, like that for teacher participants, involved the use of my professional judgement to identify key people able to provide well-informed comment on teacher professional learning, and the development and use of professional learning policy. This selection was potentially subject to both conscious and unconscious bias despite my attempts to maintain a high level of objectivity. Identifying a list of key organisations across the meso-level of the Scottish education system with a role in teacher professional learning policy and practice was not difficult but selecting potential interviewees within them required the exercising of greater judgement. Some of the system leader participants occupied unique and powerful roles within these organisations. Having been granted access to interview such individuals, who may be used to holding significant power and perhaps being treated with a degree of gravitas, a potential weakness in the process could have been that they controlled the conduct of the interview, despite the semi-structured format, and not allowed me to probe or challenge them in a manner which allowed me to gain the data I desired. McPherson and Raab (1988), when describing their processes when interviewing individuals holding roles with significant station and power, illustrate the fine balance which must be maintained by an interviewer to gather data effectively from such individuals. I worked to minimise any difficulties by always conducting myself in a professional manner and drawing on and maximising my own experience of working in educational policy circles. That some of the system leaders could have been reasonably easily identified by those very familiar with Scottish education may have restricted the information they might have been prepared to divulge, even with their opportunity to approve the final transcript of their interview and remove any content with which they would not be happy to be quoted, even under an anonymised attribution. It is possible in such situations that they were more likely to comment along official organisation policy lines rather than give a more individual response indicating how they themselves considered things to be working.

Finally, the main purpose and endpoint of professional learning was taken to be the enhancement of a teacher's knowledge-base rather than pupil outcomes. This makes the reasonable assumption that high-quality professional learning does impact positively on pupil outcomes. Although I drew upon the literature on effective professional learning when

analysing the professional learning experiences of teachers, the study relies to an extent on the participants' assessment of what is impactful rather than any direct measure of whether this indeed had a positive impact on pupil outcomes. There is never likely to ever be a perfect study with no limitations or weaknesses, however, all possible attempts were made to minimise any potential negative impact on participants.

4.10 Summary

My previous research and professional experience identified that several barriers exist which prevent good teacher professional learning in Scotland, including different policies and initiatives pulling teachers in different directions: a lack of policy alignment. Given the reasonable consensus around the features of effective, fit-for-purpose professional learning, and a national policy framework which is generally consistent with the realisation of such professional learning, this study therefore set out to investigate how closely the professional learning experiences of teachers align with those described by policy, and where the experiences of teachers are not well aligned with policy why this might be the case. In this chapter I have set out and justified how, by using a case study approach to gathering data from physics teachers, I have sought to probe into the professional learning experiences as lived by practising classroom teachers, members of the micro-level of Scottish education. I have also sought the views of a range of school and system leaders across the meso-level of Scottish education to determine their perspectives, as well as conducted analysis of documents relevant to professional learning policy and practice. From this evidence my aim was to then generate useful information which can be of use for improving the professional learning of physics teachers in Scotland but also teachers more generally. This is what I now move on to in subsequent chapters, first by presenting the data before going on to discussion and conclusions.

Chapter 5 Findings

There are three sources of data: policy documents; school and system leaders, and physics teachers. To address research question 1, analysis begins with a systematic documentary analysis of national policy documents relating to professional learning. Research question 2 is addressed by exploring the lived professional learning experiences of the teacher participants, first their professional learning journeys through their career followed by their professional learning experiences during 2021-2022. The teachers' experiences are analysed against both Kennedy's (2014) and Timperley's (2008) models of professional learning. Research question 3 is addressed through interviews with school and system leaders and a comparison of the findings from all three data sources.

5.1 Documentary analysis

The analysis of policy documents relating to the professional learning of teachers begins with an analysis of the contractual requirements of teachers before moving through a genre chain, see figure 17, of other documents which influence the professional learning of teachers.

5.1.1 Teacher contractual requirements

The contractual requirements of teachers are laid out in the Handbook of the Scottish Negotiating Committee for Teachers (SNCT, 2007), although additional appendices have been added over time resulting in a 'live' document. The SNCT is a tripartite body in which teacher organisations, local authorities, and the Scottish Government have a voice. The Handbook sets out the duties and arrangements for the working time of teachers. It states that teachers are required to meet the professional standards and to participate in Professional Update as set by the GTCS (GTCS, n.d.-e, 2021b). A transformative conception of professionalism is alluded to through several references to collegiate working, contributing to the professional development of colleagues, professional autonomy, and empowerment. However, a more managerial conception and signs of accountability pressures appear on occasions such as where it states that teachers are expected to inform appropriate managers when they wish to carry out some of their non-teaching duties, such as preparation and correction, off school premises (SNCT, 2007, app. 2.7).

A teachers' working year includes five in-service days and the Handbook states that teachers use these for "*duties as planned by the council*" (para. 3.5) but little further guidance is provided on the nature of these duties other than they will include "*development activity planned by the council*" which "*may form a part of the CLPL plan and record*" of teachers (para. 9.6). In-service days provide time for teachers to meet with others from schools across their local authority and therefore provide valuable opportunities for collaborative CLPL. The use of teachers' time beyond class-contact, preparation, and correction (nominally 5 hours per week) is agreed by local negotiating arrangements at school level and includes CLPL. Teachers also "*have a contractual requirement to complete a maximum 35 hours of Continuing Professional Development (CPD) per* annum" (para. 3.11) then referring readers to the section on CLPL for further details. No minimum requirement is stated leaving whether the 35 hours is an expectation or an entitlement open to interpretation. In the section on CLPL it states, using quite directive language, that this 'shall' consist of a mixture of personal, school-based, and other professional learning taking account of individual, school, local, and national priorities. This should be negotiated between the individual teacher and their line-manager within the professional requirements as set out by the GTCS and it is the responsibility of the employer to ensure there a wide range of CLPL available, but it is the responsibility of the teacher to undertake their agreed programme of CLPL. However, in both the lists of teachers' specific duties and of suggested activities a teacher might undertake during their contracted hours, the relative prioritisation of CLPL is perhaps alluded to as it appears last in both cases. The "*Statement on Teacher Professionalism*" (app. 2.6) refers to a focus on "*increasing professional autonomy and empowering teachers*" across Scottish education as well as the need for "*a climate of collegiality*" all consistent with a transformative conception of professionalism. The contractual need for teachers to complete their duties in a 35-hour week is stated in several places, as are initiatives to address the difficulty teachers have achieving this in practice. In another mix of conceptions of professionalism, it states that "*Teachers have a right and an obligation to contribute to the process by which national and local priorities are determined*" (app. 2.7).

The different language used in different parts of the Handbook is consistent with both its evolution over time and the likely difficult negotiations during its production between funders, employers, and employees with different priorities, desires, and conceptions of professionalism. The Handbook states that the CLPL teachers undertake must take account of national, local, and school priorities, and whilst this does not dictate any modes of

professional learning or conception of professionalism, in my view, this therefore gives the potential for external accountability pressures and a managerial conception of professionalism to dominate in implementation. Central to these contractual requirements are the processes of maintaining registration with the GTCS, so it is to these documents I turn next.

5.1.2 GTCS professional standards and related documents

The GTCS is independent of government (GTCS, n.d.-a) and its policy documents are approved by its Council, on which teachers form the majority, with representation from all phases. The two most relevant documents for classroom teachers are the Standards for Full Registration (SfFR) and for Career-long Professional Learning (SfCLPL) (GTCS, 2021b, 2021a) but guidance on Professional Review and Development (PRD) and on professionalism and professional learning are also considered (GTCS, 2017, 2019).

In the SfFR and SfCLPL, which are substantially similar, the word 'profession' and its derivatives are used over 140 times, even although the main text in each of these documents extends over only nine pages. The great majority of these is the word 'professional' used as an adjective before words such as values, commitment, and illustration. This liberal use adds little to the meaning of the text and is perhaps indicative of a profession still struggling to justify it being called a profession. More telling is the use of the word 'professionalism', which is used around a dozen times, not including headings. It is used in the context of teacher professionalism being reconceptualised, and teachers enhancing or developing their professionalism. This implies the authors consider there to be some deficit in teacher professionalism, but they do not define explicitly the conception of professionalism desired. However, from the multiple references to teachers working collaboratively and collegially, a transformative conception of professionalism dominates the discourse although the terms 'agency' and 'empowered' are each used only once in each document. This is supported by the position paper on professionalism and professional learning (GTCS, 2017) which unlike many GTCS documents is well referenced, not only to other Scottish educational policy documents, but importantly to seminal texts in the field of collaborative professionalism and teacher agency (Cochran-Smith & Lytle, 2009; Hargreaves & Fullan, 2012; Lieberman et al., 2017; Priestley et al., 2015; Sachs, 2016) indicating a transformative conception of professionalism.

Another important GTCS document relating to professionalism is its Code of Professionalism and Conduct (COPAC) (GTCS, 2012a), however, its role is somewhat different to the others as it plays an important part of the GTCS's fitness to teach procedures "*so that the boundaries of professional behaviour and conduct are clear and public trust in teachers is maintained*." (p4). It only makes one reference to professional learning, stating that teachers "*take responsibility for their own professional learning and development and be an active partner in the communities in which you work.*" (p11). Reflecting its aims, the COPAC is written in a more directive, minimum competency style compared to the other GTCS documents, but nevertheless, as it is a teacher's responsibility to meet the requirements of the SfFR this alludes to a more transformative conception of professionalism. Transformative modes of professional learning are encouraged in the SfFR, and particularly in the more aspirational SfCLPL, with references to practitioner enquiry as stance, reflection on practice, engagement with educational literature, research and policy in a critical manner, and the participation in robust professional dialogue, although with whom is not specified. In relation to the introduction of professional standards, Sachs (2003a, p180) and Groundwater-Smith and Mockler (2010, p57) have observed that this can act as a catalyst for professional learning, but there is little detail on the modes of professional learning used as a result and the assumptions about how this change happens are implicit.

Professional Review and Development

Teachers are required to commit to lifelong learning through engaging with the Professional Review and Development (PRD) process which feeds into the Professional Update (PU) process. The PRD process in all local authorities was reviewed in 2021 based on guidelines created by the GTCS with input from "*professional associations and other educational bodies*" (GTCS, 2019). The guidelines go on to state that "*these revised Professional Review and Development Guidelines have been shaped and created by the profession, for the profession. They are designed to support the development of cultures that foster agency, promote teacher-led professional learning and enable collaborative professionalism.*" (p2). Much is made of high-quality PRD taking place in schools with a "*strong culture and climate of trust, where teachers feel nurtured, valued and empowered*" (p4). This raises the issue of who is being expected to value and empower teachers in such cultures, and therefore the role of management and leadership in schools and beyond. The guidelines also state that "*local authorities and employers should ensure they adopt a robust and systematic approach to*

developing coaching approaches, providing quality training opportunities for all reviewers." (p9). This is only in relation to the PRD process rather than coaching for professional learning, such as instructional coaching, but nevertheless this is a direct instruction from the teaching profession to employers and if implemented could support improvements in coaching more widely in schools. That employers need to provide adequate time for the PRD process and to manage teacher workload and bureaucracy are referred to in the section on employer responsibilities, in a similar manner to that in the SNCT Handbook discussed above. However, there is no mention of employers needing to provide CLPL to address the needs of teachers identified during the PRD process, although there is a statement that reviewees and reviewers should have "*knowledge of, and access to, professional learning opportunities*" (p8). A feature of the PRD Guidelines is the use throughout of practitioner quotes as examples of good practice, adding to the impression that the document has been written "*by the profession, for the profession*" (p2). The references to cultures of trust, teachers becoming agents of change, and coaching approaches illustrate a desire for a transformative conception of professionalism but the very process-based nature of the guidelines for the PRD process itself provides ample opportunity for more managerial conceptions of professionalism to emerge, especially when a system is under pressure as alluded to by the references to time and bureaucracy.

None of the GTCS professional standards refer to the National Model of Professional Learning (Education Scotland, 2019a), although it is referred to in the PRD review guidance, but even then, only once and with no great compulsion, "*Schools may build knowledge and awareness of the varying approaches to professional learning within school communities through engagement with the National Model of Professional Learning.*" (p11). The National Model of Professional Learning is published by Education Scotland, and it is to their documentation I now turn.

5.1.3 Education Scotland

The National Model of Professional Learning, see figure 18, can be accessed either from the professional learning and leadership part of the Education Scotland website (Education Scotland, n.d.-g) where it is referred to as "*The national model* …" or from the national

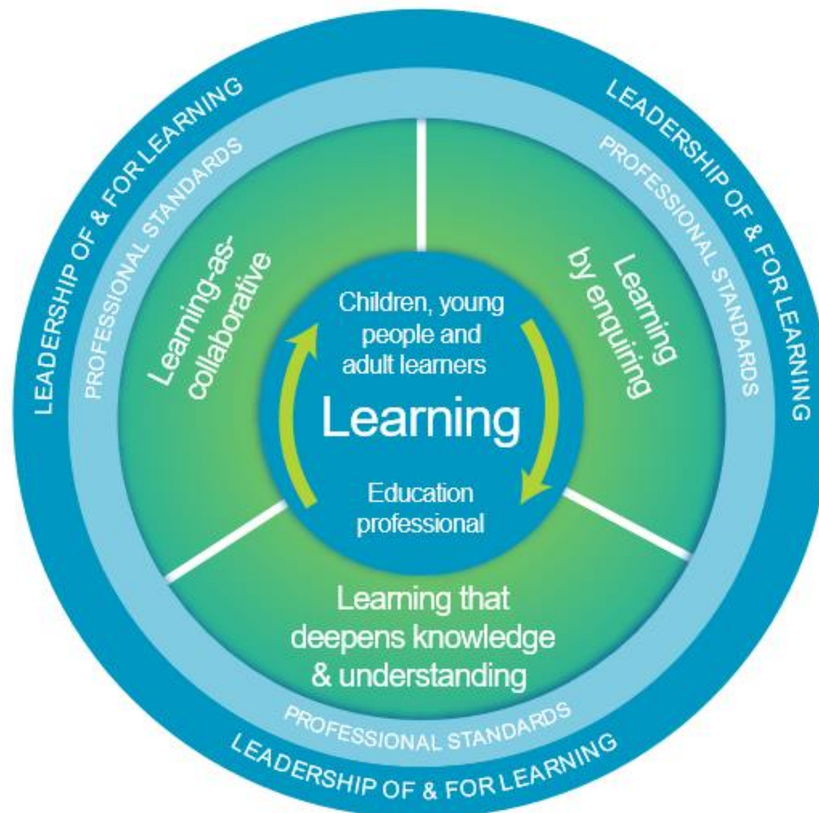


Figure 18: The Scottish *National Model of Professional Learning* infographic (Education Scotland, 2019a)

improvement hub (Education Scotland, n.d.-a) where it is referred to as "*A national model* …" which suggests other models might at least be available or possible. The authorship of the model is not stated.

As with many Education Scotland documents it does not contain any references to any underpinning research or evidence, perhaps an attempt to control the narrative and present this model of professional learning as the only one available, or worthy of consideration (Scott, 2000, p20). Some insight to the authorship and literature underpinning the model can be gained in a paper describing the model written by McCaffery, an Education Scotland officer in its Professional Learning and Leadership team. She refers to the "*national model of professional learning, which builds on national and international research (Timperley, 2008; Hargreaves & Fullan, 2012, amongst others) and the work of the General Teaching Council for Scotland*" (McCaffery, 2019, p6). Presumably the work of the GTCS referred to is that described by Hamilton (2018, p877) as "*The GTCS Model of the Teacher*" on which he

claims the GTCS professional standards are based, and which he states draws on the work of "*educationalists such as Lawrence Stenhouse, Judyth Sachs, Michael Fullan, Linda Darling-Hamilton, Marilyn Cochrane-Smith and Andy Hargreaves*", all of whom are internationally renowned in the fields of teacher professional learning and teacher professionalism, and many are referenced in the GTCS Position Paper on Teacher Professionalism and Professional Learning in Scotland (GTCS, 2017) which includes a discussion of the model. However, no specific or explicit references are made in the Education Scotland documentation on the model itself, although during the period of this study, perhaps even as a result of discussions I had with people during that time, links to the work of some of the authors listed above were added to one of the Education Scotland website pages where links to the model are found (Education Scotland, n.d.-a).

The model's infographic places the learning of education professionals at its centre, along with that of the children, young people and adult learners they teach. The key principles and features text which supports the infographic speaks to, or even at, educators as objects with many direct and unambiguous statements such as "*learning is an interactive and active process*" and "*there is an ethical prerogative to taking an enquiry stance*" without justification of these statements, detail of how they might be achieved, or much latitude for alternative approaches. Although the use of terms such as 'collaborative', 'enquiry', and 'criticality', and statements such as "*leaders commit to … creating the conditions where professional learning can thrive – space, time, culture and trust*" suggest a transformative conception of professionalism the tone of the text is much more managerial in nature which might diminish the opportunity for teachers to exercise professional judgement and to feel pressured rather than empowered. The model embeds the individual education professional within 'leadership of and for learning' which has a more systems perspective. This overlaps with How Good Is Our School? (HGIOS) (Education Scotland, 2015), Scotland's educational self-evaluation and inspection framework written by Education Scotland's inspection arm for use by all school staff.

In my view, HGIOS is written in an authoritative style with the school inspectorate describing what is expected from other actors in the education system, exhibiting a clear power dynamic. In its foreword, it states that HGIOS will be followed up with a programme of professional learning which all practitioners will be able to access. This implies a central provision made available to teachers and not developed with, or by, teachers, again

reinforcing this power dynamic of some in the meso-level dictating practice to those in the micro-level of the education system. The HGIOS Quality Indicator 1.2 'Leadership of learning' includes the themes 'Professional engagement and collegiate working' and 'Impact of career-long professional learning' (Education Scotland, 2015, pp22-3). Unlike the GTCS professional standards and the National Model of Professional Learning, HGIOS includes 'Level 5 illustrations' of what is considered 'very good' practice on a 6-level scale from 'unsatisfactory' to 'excellent'. This document also uses terms such as 'collegiate' and 'enquiry' suggesting a desire for transformative professionalism and includes several 'challenge questions' to prompt self-refection, but the very nature of the document, and emphasis on the provision of evidence, which is not a bad thing in and of itself, results in a managerial and top-down accountability tone being set. There is a strong emphasis on 'leadership' throughout HGIOS: the term is used 68 times, in the context of teacher leadership and the leading of learning as well as in relation to school management. The illustration does state that all staff should understand and use 'the model of professional learning', although what model is being referred to is not clear, but this implies a precursor to the national model as HGIOS pre-dated the publication of the current national model. The illustration also gives some, very reasonable but not exhaustive, detail of the expected content of CLPL which includes ensuring teachers' subject knowledge is extended, deepened and up-to-date, addressing cross-cutting themes such as sustainability and global citizenship, and digital learning. It also details some modes of CLPL such as collaborative practitioner enquiry, peer learning, constructive feedback, professional dialogue and debate which are all consistent with more transformative approaches to CLPL. It also identifies three purposes for CLPL: to build and sustain the practice of teachers; to impact on the progress, achievement, and attainment of learners, but also to take forward improvement priorities, although it does not specify whose. This therefore raises the question of how teachers might identify improvement priorities, something to which the SNCT Handbook states they have a right and an obligation to contribute, and how well these improvement priorities might then align at national, local, school, and individual levels, and with the CLPL of individual teachers.

5.1.4 The National Improvement Framework

On an annual basis since 2016, the Scottish Government has published a National Improvement Framework (NIF) which "*sets out the vision and priorities for Scottish education that have been agreed across the system*" (Scottish Government, 2021a, p4), together with

an improvement plan and evidence of improvement activity. From 2016 to 2020 the NIFs had broadly similar formats and identified six key drivers of improvement, of which 'teacher professionalism' was one. For 2021 and 2022 the format of the NIFs changed reflecting the impact of the COVID-19 pandemic but the six key drivers remained, although in 2022 the key driver relevant to this study became 'teacher and practitioner professionalism' recognising the role of others beyond teachers in education improvement. The NIFs have been written by Scottish Government civil servants, but clearly with input from agencies such as Education Scotland, although there is a lack of clarity about the mechanism for wider professional input, which raises a concern to the extent to which the content of the NIF is affected by narrative privilege. Each NIF is published with a foreword by the Cabinet Secretary with responsibility for education, however, the Scottish Education Council (SEC) is the "*key forum for oversight of improvement in Scotland, as defined by the National Improvement Framewor*k" (Scottish Government, n.d.-b). The SEC is made up of senior figures from more than twenty organisations across education, some of whom have represented different organisations at different points in time; a longstanding issue in Scottish education which can prevent creativity and constructive challenge (Humes, 1986; OECD, 2021, p87). This range of representation is presumably how the Scottish Government can claim the priorities have been agreed across the system, although how agreement is achieved in practice and how much SEC members consult with others in the meso-level and micro-level of Scottish education is opaque.

The NIF's apparent approach to improvement is based closely on well-supported OECD evidence of success, but in its first year was rapidly undermined by the publication of a detailed, prescriptive, and rapidly paced delivery plan, illustrating a simplistic mechanistic conception of teaching and teacher professionalism (MacDonald & Rae, 2018, p838; McIlroy, 2018, p627). The deadlines set, and expected pace of change, perhaps reflect more the period of political electoral cycles rather than the timescale necessary to effect complex and lasting educational change as described by Robinson, Hohepa and Lloyd (2009), Timperley, Wilson, Barrar and Fung (2007) and others. The NIF and the associated delivery plan therefore sent very mixed messages to the teaching profession, with its rhetoric of empowerment but also a tone of command, prescription, and control, particularly when compared to the tone of the likes of the Donaldson Report, the OECD review, and the principles of CfE.

With this emphasis on delivery, the NIF includes much data gathered by the Scottish Government from other organisations. The short section on teacher and practitioner professionalism (Scottish Government, 2021a, p13) appears to be wholly based on information provided by local authorities with statements such as "*local authorities highlighted the range of high-quality professional learning opportunities they are developing*" with only one mention of local authorities working with partners to provide professional learning, and no evidence to support their claim that the provision is high-quality, or beyond the development stage, or that it meets the needs of practitioners. The professional learning programmes mentioned include leadership; self-evaluation processes; assessment and moderation; and tracking and monitoring, all of which imply an emphasis on accountability processes rather than on improving teaching and learning.

The teacher and practitioner professionalism improvement plan part of the NIF begins by stating that "*teacher and practitioner professionalism demonstrates the overall quality of the teaching workforce in Scotland and the impact of their professional learning on children and young people's progress and achievement.*" (p28). There is no definition of the conception of professionalism, how this might 'demonstrate' quality, and a taken-for-granted-ness of a link between 'professionalism', the impact of any professional learning, and learners' achievement. This statement, despite its ambiguity, is being presented as a fait accompli by the national government. The following paragraph states, not unreasonably, that the quality of teaching is a "*key factor in improving children and young people's learning*", however, the rest of the paragraph focuses entirely on early years education with no mention of teachers at other stages suggesting a lack of activity at these stages by those inputting evidence to the NIF.

A "*What is the evidence telling us?*" section follows and opens by saying evidence comes from the inspectorate's national overview which states that "*schools engage well in collaboration across the system*" although there is no detail of which staff are involved in collaboration activities or what criteria have been used to make this judgement. That the COVID-19 pandemic has resulted in the need for professional learning in digital skills is highlighted but 'quality assurance' is mentioned three times within the space of six lines of text implying a managerial conception of professionalism dominates. Likewise, the focus of the next paragraph relating to secondary schools is all about using local authority support and subject network groups to share understanding of assessment standards providing further evidence

of accountability pressures. A dyslexia professional learning pilot successfully completed by only ten teachers is then mentioned: hardly an example of impactful systemic professional learning for it to feature so prominently. Much of the rest of this section consists of statistics on teacher numbers and pupil-teacher ratios, of no significant relevance to either teacher professionalism or professional learning. In my view, this illustrates a somewhat desperate attempt to collate any semi-relevant scrap of evidence rather than there being a coherent, strategic plan to improve support for teaching and learning and the educational outcomes for both young people and the system as a whole.

A section "*new improvement actions for the year ahead*" (p29) follows, which commits the Scottish Government to "*explore professional training*" in the early learning sector and that Education Scotland "*will deliver three professional learning sessions*" for practitioners in early learning: not an ambitious professional learning commitment or target for a national agency to deliver. There are actions in response to the International Council of Education Advisers (ICEA), OECD, and Audit Scotland reports which says Education Scotland "*will build on existing professional learning and leadership suite programmes supporting empowerment and agency*" to "*support capacity building across the system locally, regionally and nationally*" suggesting work to promote a transformative conception of professionalism. There are then statements about commitments to reduce contact time for teachers and recruit more teachers which are perhaps more related to teachers' conditions of service than professionalism. This section concludes with statements about support for exploring or delivering professional learning on dyslexia, for pupil support staff, and on safeguarding, restorative approaches, race equality, literacy and numeracy. There is no statement, commitment, or target about support for professional learning for teachers on topics or subjects more broadly, or teaching and learning in general, giving the document the feeling of it describing a collection of existing or reactive initiatives to specific problems rather than a strategic plan to improve the professional learning and professionalism of Scottish teachers on a systemic basis.

Annex A of the 2022 NIF includes "*Ongoing/completed activity from the 2021 National Improvement Plan*" and on pages 60-68, under the heading 'Teacher professionalism', summaries of twenty-three actions are listed indicating whether these are completed, business as usual, ongoing or superseded. These actions are conducted by various organisations, but they do not all seem to be related to teacher professionalism, such as the

Young STEM Leaders Programme (pp60-1) which is for school pupils, again reiterating the feeling of it just being a collection of initiatives. Professional learning is mentioned as being delivered or required in several of the actions as well as some actions under the other five key drivers, such as 'School Leadership', 'Assessment of children's progress', and 'School improvement', insofar as identifying topics on which teacher professional learning is required to deliver these actions.

The 2022 NIF (Scottish Government, 2021a) begins with a quotation from the ICEA and the content of the NIF has been influenced by a number of recent reports on Scottish education, several of which are listed on page 4. Following the genre chain, it is to these I now turn.

5.1.5 Reports with influence on Scottish education policy

International Council of Educational Advisers (ICEA)

The ICEA was set up in 2016 to advise on the Scottish Government's priorities and on the reporting and planning cycle of the NIF (Scottish Government, n.d.-a). It is therefore unsurprising that its reports have influenced the content of the NIF. The ICEA has a membership of ten internationally recognised experts and published reports for 2016-2018 (ICEA, 2018) and 2018-2020 (ICEA, 2020). As the latter is more relevant to the period of this study it is my primary focus. Its 32 pages includes 52 references to the term 'profession' and derivatives, and unsurprisingly for a council including Hargreaves (Hargreaves & O'Connor, 2018), Campbell (Lieberman et al., 2017), and Chapman (Hadfield & Chapman, 2009) includes several references to collaborative professionalism and to increasing professional agency and professional empowerment, as well as to the use of professional networks, all indicating a transformative conception of professionalism. It is the ICEA's assessment that the Scottish Government "*has had a strong focus on improving the professionalism and wellbeing of teachers*" (p27) and that "*This has led to a much greater emphasis on professional learning as an ongoing feature of professional growth rather than on training for specific purposes.*" (p27). However, it also recommends "*a commitment to system change that is driven by collaborative professional relationships and underpinned by peer challenge rather than external demands*" (p30) indicating that they consider that work has still to be done to embed a transformative conception of teacher professionalism and to move away from a managerial conception of professionalism and external accountability demands.

The meetings of the ICEA have been chaired by the First or Deputy First Minister of the Scottish Government and supported by senior civil servants with occasional representation by senior staff in Education Scotland. During the COVID-19 pandemic meetings were virtual, preventing visits to schools as occurred previously (Scottish Government, n.d.-a). This raises the issue as to the extent that information available to the members of the ICEA, most of whom live outwith Scotland, has been filtered through the Scottish Government.

In the 2018-2020 report, the ICEA provides advice on two priority themes "*navigating the pandemic and beyond: redesigning schooling, teaching and learning*" and "*governing and leading education system change and improvement*" (p5). The former includes items such as increased use of digital technologies and the reform of curriculum and assessment, and the latter highlights collaboration for a networked learning system and continued learning by school leadership and the teaching profession, all actions which will likely require significant professional learning if they are to be realised. The ICEA recommends Scotland become a 'Networked Learning System' where "*educators are collaboratively inquiring professionals who are empowered to lead improvement in their own and others' professional settings. … Increased professional agency and constantly improving professional judgement are based on subsidiarity, professional learning, collaborative inquiry, and horizontal accountability.*" (p22). This is a strong recommendation to move to a transformative conception of professionalism, however, the ICEA provide little specific detail as to how this might be achieved beyond greater subsidiarity and a continued focus on professional learning for both leaders and teachers, which again raises questions about how the necessary capacity of teachers and other practitioners might be best built and the required culture change within Scottish education achieved. The need for clarity and alignment of policy across the system is highlighted "*The challenge of central government is to balance necessary consistency of purpose with local energy, innovation and ownership. The roles of national and local government and of intermediate agencies need to be clearly understood*" (p20). This is consistent with observations and recommendations in the OECD review of CfE which preceded the setting up of the ICEA, and which was conducted by a team including Hargreaves (OECD, 2015).

OECD Reviews of CfE

The OECD has conducted two reviews of CfE (OECD, 2015, 2021), however, in each case recommendations included much about changing the structures and culture of Scottish education as well as about the curriculum. In 2015 this included "*strengthen the professional leadership of CfE and the 'middle'*" with more emphasis on "*professional leadership focused directly on the nature of teaching, learning and the curriculum in* schools" (p21) and "*develop a coherent strategy for building teacher and leadership social capital*" (p12), and in 2021 "*continue building curricular capacity at various levels of the system using research*", "*ensure stable, purposeful and impactful stakeholder involvement with CfE*", and "*simplify policies and institutions for clarity and coherence*" (pp13-4). As with the ICEA reports, there is clear messaging that Scottish education should continue in the direction of embedding a transformative conception of professionalism with statements such as:

> "*There needs to be clarity about the kinds of collaboration that work best to bring about innovations and improvements to enhance student learning, and to create coherent and cohesive cultures of system-wide collaboration. This is not an argument for mandated collaboration or contrived collegiality to implement centrally-defined strategies. But it is to argue for greater consistency of collaborative professionalism*" (OECD, 2015, p17)

The OECD reports "*Scotland has made considerable progress in enhancing the quality of school leadership and in professional learning across the school system*" but also recommends "*a more coherent policy environment should make for a less bureaucratic and more streamlined system*", "*Scotland should consider policy and institutional simplification, including ending or combining some policy initiatives*", and "*the provision of additional, dedicated and ring-fenced time for all teachers, for curriculum planning, for monitoring of student achievement and in support of moderation of assessment outcomes*" (OECD, 2021, p125), changes which will simplify the policy environment and facilitate teachers being able to demonstrate more agency and empowerment. Muir (2022, p76), in his report commissioned by the Scottish Government following the OECD review in 2021, reported pleas for a simplified and more coherent policy environment with leaders in secondary schools stating being adversely affected by having to simultaneously respond to 40 policy initiatives and he recommended Scottish Government and other national bodies should take

action on this to ensure expectations are "*realistic, manageable and well understood*" (Muir, 2022, p77). The Scottish Government response to this was to "*accept in principle*" and stated they would engage with the Scottish Education Council on this (Scottish Government, 2022b).

In response to the OECD's 2015 recommendation to strengthen the 'middle' of education the RICs were set up, although the OECD noted in 2021 that the experienced support from them "*seems more limited than hoped for*" (p63), a view supported by respondents to the subsequent open consultation (Muir, 2022, p13, p51). The OECD review team commented on the politeness of the teachers interviewed, even during focus groups held independently from the Scottish Government, and conjectured that this perhaps prevented them from expressing strong criticism of facilities and time for professional learning, although other interviewees had been more critical (OECD, 2021, p64). This contrasts with the more positive view on progress made by RICs expressed by the ICEA (2020, p5), perhaps reflecting the filtering of information to the ICEA through civil servants rather than directly from practitioners. This raises concerns about the hegemonic maintenance of power relations and whether the voices of teachers in the micro-level are being heard at the macro-level of policy decision-making, a problem identified much earlier by Hartley (1986, p233) when describing in-service education in Scotland where he described communication only occurring between contiguous strata in the educational bureaucracy and as a result the needs of officialdom prevailing over those of teachers. An example that such power relations remain is that in recent years the Scottish Government has released its response to reports it has commissioned from independent organisations at the same time as the reports themselves (Muir, 2022; OECD, 2021; Scottish Government, 2021b, 2022b). This tactic means that there is a tendency for attention to be focused on the actions decided by the Scottish Government and there is no opportunity for public discourse about the wider contents of the reports and possible options for how they might be followed up before decisions are made. The Scottish Government has taken control of the narrative from their privileged position having had sight of the reports ahead of open publication.

As the teacher participants in this study are teachers of physics, the Scottish Government's STEM (Science Technology Engineering Mathematics) Education and Training Strategy (Scottish Government, 2017b) is of relevance to this study. The OECD reported that the strategy "*includes supporting professional learning to increase teacher confidence in delivering STEM*" (OECD, 2021, p51), although this implies STEM is a singular policy construct

ready formed to be delivered to learners by teachers rather than a complex, multi-disciplinary curriculum area. Although the main focus of the strategy is on improving the knowledge and skills of learners, professional learning for teachers is a significant part of achieving the strategy.

STEM Education and Training Strategy

The strategy was published following a formal consultation and the publication of relevant reports (Scottish Government, 2017b, p7). There was "*strong support in the response to the strategy consultation for more and improved STEM resource, training and support for teachers and practitioners, and … also indicated a requirement for more professional learning and collaboration in STEM*" (p11). To achieve this "*Education Scotland will work with partners and, in particular, practitioners, to develop a coherent national approach to STEM professional learning from early 2018 [including] an online professional learning offer*" (p13). This led to the establishment of the 'Enhancing Professional Learning in STEM Grants Programme' where schools and organisations could bid for funding to support CLPL for teachers of the STEM subjects (Menzies, 2021; Scottish Government, 2019e). The strategy says little about the nature and content of the professional learning, only that there will be an 'offer' for practitioners together with a commitment for ongoing funding for some organisations already providing CLPL in the STEM subjects, including SSERC, together with increasing the CLPL opportunities provided by colleges and universities (p41). There is also a commitment to work with Education Scotland, local authorities and RICs to identify priorities and to provide a self-evaluation and improvement framework (p42) implying a focus in the meso-level on accountability measures rather than on professional learning.

As the interview data was gathered during 2021-2022, the policy context set by the five-year STEM strategy, 2017 to 2022, together with the two OECD reviews, 2015 and 2021, and the period of the two ICEA reports, 2016-2020, should have informed both the national policy, described above, and influenced the practice of the participants in the period immediately prior to data gathering. The members of the ICEA are clearly promoting a continued move towards transformative professionalism and more transformative modes of professional learning, however, the evidence gathered around the OECD reviews, together with the tone in which the STEM Education and Training Strategy is written, suggests more managerial conceptions of professionalism remain prevalent.

5.1.6 Summary

Whilst the importance and need for professional learning is generally promoted through this genre chain of policy documents little is said about its purpose or the forms that it should take. Therefore, other than considering the conception of professionalism promoted it is difficult to make any detailed comment about what the policy documents say in relation to the theoretical framework set out by Kennedy's model (Kennedy, 2014) or Timperley's principles for professional learning (Timperley, 2008), for example, whether professional learning is more transmissive or transformative, or whether it is focused on valued student outcomes, is sustained, draws on knowledgeable expertise, or has active leadership. Other than the repeated mentions of the need to limit teacher workload in the SNCT Handbook, the acknowledgement of the impact of the COVID pandemic in the most recent ICEA report, and more general statements such as the benefits of collaboration to share resource, there is little or no acknowledgement of the real-world constraints which might make the realisation of the policies difficult. How professional learning is provided, facilitated, and experienced is up to how leaders and teachers interpret and implement these policies, and how they negotiate the constraints on resource, including time and funding, with which they work. Throughout the documents, despite the frequent encouragement of collaborative professional learning, there is little acknowledgement of a need for professional learning for the teacher educators leading or facilitating professional learning. They are often likely to be people who primarily identify, not as teacher educators, but as teachers, school senior leaders, or officers in agencies. I therefore turn to the views of those in the education system's macro-level and meso-level who have a role in the professional learning of teachers.

5.2 School and system leader interviews

The views of leaders on professional learning policy are then followed by other themes emerging from their interviews.

5.2.1 Policy documents and their alignment

When asked about which policy documents they considered particularly important for supporting professional learning, ten of the fourteen leaders mentioned the GTCS professional standards, and this was frequently the first thing mentioned. The National Model of Professional Learning was mentioned by seven of the fourteen leaders. Beyond

this a wide range of other documents was mentioned a small number of times including all the policy documents, apart from the SNCT Handbook, included in my genre chain, see figure 17, together with other documents such as curriculum and assessment specifications. When asked which policy documents teachers should draw upon to guide their professional learning, all leaders mentioned the GTCS professional standards with around half also mentioning further GTCS advice, the National Model of Professional Learning, and local authority PRD and PU guidance, although several considered them to be not as well known about or used as intended. Only three leaders mentioned the National Improvement Framework, and none stated it something teachers should consider. Surprisingly none of the leaders specifically mentioned school improvement plans as something teachers should look towards to guide their professional learning. Perhaps this was considered so obvious that it need not be mentioned, however, throughout the interviews there was a general consensus that school improvement plans were important in this regard, although some also suggested individual professional learning needs should also inform the content of school improvement plans. How policy is interpreted and used in the different levels of the system was mentioned by several leaders as illustrated by Emma's comment:

> Emma: "*I suppose that policy occurs in the macro-level and once it's actually been interpreted in the meso and the micro the policy is no longer visible. So, it becomes a thing to do, rather than a thing, not that I think policy is a thing, policy is a discourse*."

Bruce expressed concerns about teachers being disconnected from national policy and by implication policymaking.

> Bruce: "*[Teachers] know [national policy documents] exist, but they don't feel that it is their job to do it. They feel it is the job of, whether it's the local authority or the school or their PT, whichever body is above them, I think they feel that it is their responsibility to use it and then give them what they need. That's where I am concerned about de-professionalisation because I don't think there are very many classroom teachers … asking, well, what does this tell me that I actually need to do. They see, most teachers, see policy documents as being for other people*."

How Good Is Our School? was mentioned by four of the fourteen leaders. Although acknowledged by most as not intended for guiding professional learning, its use of questions and illustrations for each of the quality indicators was considered good.

Mary: "*If you look at all the questions that go around each of the quality indicators, you know, there is quite a lot that relates to professional learning*."

Bruce contrasted the format of How Good Is Our School? with the professional standards and considered the format of the former to be more helpful and wished to see better alignment between the two, both to provide specific illustrations of the professional standards to make them easier to use and to better integrate personal self-reflection and school self-evaluation. Emma also highlighted the disconnect between the two documents and processes, and how this can have unintended consequences.

Emma: "*I think the professional standard should be the fundamental policy for professional learning. … However, what people actually do on the ground is take How Good Is Our School? and then align themselves and use How Good Is Our School? as a self-evaluation framework. So, they're using something that is performative, accountability driven, external and are using that as a self-evaluation framework. So, where did that collective become individual? Why are teachers in general answering the call of performativity and accountability before their own, their own self-evaluation? There's an imbalance in the system*."

Bruce and Emma's examples highlight misalignment in the content of different policy documents, but also misalignment resulting from the way they are used. However, amongst the leaders there was general agreement that the broad national policy direction is appropriate.

Kevin: "*If you look at national priorities, you know it's hard to argue with them, so to me tensions quite often arise … in the way it's handled and the way it's presented rather than the content themselves*."

However, too many competing policy initiatives and priorities makes life difficult for time-poor staff, especially teachers.

Linda: "*I think it's a challenge … because if everything's a priority, then there's a risk that every priority has professional learning attached, and that means it's not deep, it's not identified by the teacher, etc, etc, so I think that's a bit of a vicious circle*."

Emma: "*There's the national priorities, there's local priorities, there's school priorities, there's department priorities, there's teacher priorities, there's children's priorities, and once you put all of that in the mix, which is the most, which priority is the biggest priority?*"

Ken: "*The simple practical complexity of what we do … we have so, so many competing needs both individually and in our different teams, … if you're going to really utilise and embed your professional learning, because there are so many competing priorities, again you really need time, and also you need some degree of courage to say, do you know what, stuff everything else, these are the two things that we are going to really invest in, and if we do, we do it properly*."

This is further complicated by complex structures in Scottish education where roles and responsibilities are not always clear.

Linda: "*There's a fair amount of duplication across local authorities/RIC/Education Scotland. And I think there's something we can do locally and nationally about refining some of that so that is clearer about where you sit in the system and what the options are that you might engage in*."

Many leaders considered that whilst the broad, high-level national policy is appropriate it is not always well implemented. Kevin used his experiences of the introduction of CfE as an example of what often occurs.

Kevin: "*I go all the way back to CfE ... When you actually get under the skin and have a decent conversation with teachers, you know, no one disagreed with the philosophy, no one really disagreed with the direction of travel, but they disagreed with some of the implementation or, you know, the way it was done, and sometimes the decisions had been made locally and then were being blamed on CfE. It's not in the policy even. So, I think there's a lot, that tension exists a lot in that sort of how, how national priorities are negotiated, discussed, and used with staff as part of their professional learning*."

This was corroborated by Sam.

Sam: "*The story of CfE is almost that, you know, the intention and the reality and then the different sort of power bits or the different sort of accountability bits all start to come in. It's a different ragbag of things that are very difficult for a classroom teacher to sort their way through*."

A few highlighted that staff in different levels within the education system do not always have a good understanding of what is happening at other levels.

Mary: "*[Education Scotland] is like a parallel universe to the teachers in the classroom because I'm not sure, and I've had the ability to observe in both camps, I'm not sure that actually those leads know what's happening in the classroom and I'm definitely certain that practitioners in the classroom haven't a clue of what's happening in that parallel universe. So, that would indicate to me that the amount of resources, as in financial resources going into education, are not all working to the same picture*."

Sam: "… *about the leadership class, or it's the same usual suspects that are on this group or that group. … but if you could get more of the people at the micro-level engaging with people at the national level then that would be very interesting, … we are a graduate profession … that would be much closer to that idea of collaborative efficacy*."

Bruce. "*We've almost got too many layers that aren't coordinated … it's too muddy. To be cynical, is that because it allows each to blame the other when things are not going right whereas if there was a very clear line of responsibility it would be much more apparent who was not doing their job properly when things are not going right*."

Others were more positive about the awareness of those in the meso-level and their ability to translate national policy into forms more accessible for teachers.

Fiona: "*It's easy to overwhelm people, so I think it's the role of [local authority], for example, my local authority has outlined, there are our four priorities for school improvement, for professional learning, for the coming session*."

Elizabeth: "*I think, local authorities and the RIC as well, are quite good actually, you know, taking some of these big policy things and kind of filtering it down and simplify it down and packaging it up in quite a palatable way and I think it's something, you*

know, again, I see Education Scotland could do that as well. … We've taken that policy and kind of bite sized chunked to support practitioners and make sure they're not spending all of their time reading lots of documents … and I think that's important, and it means that no one person is having to try and master everything."

However, Elizabeth also acknowledged there was considerable variation in the capacity of local authorities to filter and present policy and others suggested the distillation of national policy into a form more accessible for teachers was a non-trivial process and one which needs to be done better. Overall, in my view, there was general concern amongst the leaders about the over-complexity of the policy environment and misalignment in policymaking and implementation as a result. The ability to present policy to others in an accessible form is related to the quality of leadership at school and system levels, so it is to this I now turn.

5.2.2 Leadership of professional learning

Translating national policy for the local context was widely seen as being an important part of leadership but the way this is done can lead to tensions within the system and between staff.

> Kevin: "*I mean it's a big part of that job isn't it, in terms of translating the national priorities into the local context. How you do that, and then there's different ways of doing that, and some of them are more likely to resolve … tension[s] than others. It all comes back to that sort of empowered system stuff about … how involved are staff*."

Concerns were expressed about the leadership of professional learning in some schools and local authorities which resulted in ineffective activities for teachers.

> Emma: "*I think that too many people in important leadership positions in schools and local authorities don't understand what professional learning is, … and so we make people busy, we do busy stuff rather than actual learning.*"

> Stephen: "*It's almost like somebody on SLT has gone like, well what are we going to do, let's fill the time*."

Linda: "*One of the things that I learned quite quickly … when people applied for jobs to work with us, just because they were good schoolteachers or good school leaders didn't mean that they would be really good at leading the learning of adults, and that was a bit of a learning journey for me*."

Mary: "*It does worry me sometimes when you've got a school that will not open up to allow teachers to really take forward their development. … Some headteachers when they get a good member of staff, they absolutely want to keep them. So, they're not necessarily, you know, telling them how good they are and allowing them opportunities.*"

Peter: "*If headteachers don't spend time prioritising professional learning why should anybody else*."

These comments raise questions about the culture in some schools and organisations which will be explored further in chapter 5.2.4. Peter went on to describe how the now compulsory masters-level headship qualifications, through the enquiry approaches used, allowed prospective headteachers to experience appropriate professional learning themselves, although he questioned whether this also develops in them the ability to translate this from personal experience into designing similar learning experiences for colleagues. There was also concern that those entering school leadership and beyond have too narrow a view of professional learning pathways, and despite the focus on leadership within many nationally supported professional learning programmes that there is often a narrow range of professional learning modes and strategies used within schools.

Emma: "*One of the things I think is we keep promoting the same person and therefore we keep getting the same type of response in leaders and when we're doing formal learning within school settings, we then tend to be very much focused on what does the policy say without critiquing the policy first, and so we end up with people doing things without a rationale for why*. *… people have got to a position because they've followed the same path, and then they think that's the path that everybody else needs to follow then, and I think that sometimes we're far too narrow, and it takes a very brave headteacher to throw that away. … it's the same old same old. Let's all just get together and let's do a working group, … everybody's got to be on a working group. Well, why?*"

Kevin: "*To what extent are we enhancing the capacity of leaders to lead that process well, you know, to what extent are they confident as coaches. You are kind of almost expecting every school leader to be, you know, not just a pretty confident coach but confident in adult learning*."

This highlights the need for more specific teacher educator professional learning for those in the meso-level leading teacher professional learning. There was also general realism about the pressures in the system and how good people management skills must be an aspect of leadership to manage these pressures and tensions.

Sam: "*I think it's about a mindset, it's about an ethos, it's about a cultural thing to say our default will be to try to listen to teachers, to try to respond to what they're asking us to do. … teachers aren't mugs and they will understand there is not the wherewithal to do everything, but at least take on board some of the main message, that's what an empowered system should feel like. Before we dump this thing on you, you know, we're going to hear what you're saying, we're going to try to meet what we can, and we're not just going to say no, even if it doesn't feel that way*."

Stephen: "*I do feel it's important that as a leader in a school that you try to recognise that 99% of people are trying to turn up and do their best every day with everything else they are trying to juggle, and try to have that empathy while also having high standards and high expectations. I try to give people free rein in how they approach things to encourage them to think and grow and develop in their own way*."

These statements illustrate the importance of the relationship between someone and their line-manager. This relationship is at the heart of the national PRD and PU procedures where members of school staff are normally reviewed by their line-manager. The leaders interviewed made many comments about the effectiveness of these procedures in helping teachers with their professional learning.

5.2.3 Professional Review and Development and Professional Update

Across all leaders there was a high level of support for the principle of Professional Review and Development (PRD) and Professional Update (PU), as there was for the GTCS professional standards which underpin the process.

Peter: "*I would say very good PRD, supported by coaching conversations is essential*."

The importance of coaching conversations was mentioned by many, however, there were concerns at the ability and/or capacity for staff to support good coaching conversations during PRD meetings and to support staff to identify appropriate professional learning opportunities. Several suggested the PRD and PU processes should not be too onerous and should be integrated into the normal working of schools and not seen as a one-off annual event.

Fiona: "*PRD is not a standalone meeting, or it shouldn't be a standalone meeting at the end of the year*."

Emma: "*What teachers should be doing, in an ideal world, they should be using the standards to self-evaluate, find areas they want to learn more about, engage in some sort of professional learning activity that satisfies the need in that area, reflect on that, look at the impact on them as a teacher, on their learners, record that learning, and when you get the opportunity to share that learning with your line-manager. That's what PRD and PU is. So, you do that on a regular basis, each year somebody stops you and goes, let's do a PRD, tell me all about your learning, and that's your opportunity to share everything you've done, and say, it's somebody stopping and caring enough about you to say, let me have a conversation about your, about your learning. And then every five years you press a different button to say I confirm, my line-manager presses a button to say I confirm. Tell me how that's a bureaucratic and a process that doesn't support teacher professionalism*."

Although Emma also recognised what often happens in practice.

Emma: "*On the ground in practice what happens is people do professional learning, and then they wait to the five-year thing, then go oh shit, I've got to put five years of stuff into this system so somebody can justify themselves*."

This was a view shared by many of the leaders, reflecting the busy environments found in schools and PRD being given lower priority to other activities which might be seen to have a more immediate impact.

Mary: "*The lack of PRDs that were being done, you know, it's one of these things I have battled with over the years. Because when you talk to everybody, they say, oh yes, it is people's right to have it done, it is the way to do it, but then why doesn't it happen, why don't we make time for that, because that's the other thing that I think in busy schools, is something that's very easy to go, you know, the faculty head, the depute head, whoever's doing it will come and say to you, oh, I've got an emergency just now, do you mind if we don't do your PRD just now, and you're not going to say no because actually if you say well I do actually want this right now it's not going to be a quality experience*."

However, the responsibility for holding PRD meetings was seen to be shared between both reviewee and reviewer.

James: "*We get people coming up saying 'I've got my meeting for Professional Update next week and I've never had a PRD meeting in four years'. And what our response is … is 'did you ask for it?'. It is your right, okay. And then, a lot of them, they want to blame the other side for not having had these meetings but actually they need to have these meetings, they can ask for them, that is their right*."

A significant part of the reason for dissatisfaction with the PRD process overall were 'clunky' online recording systems such as *MyGTCS*.

Ken: "*I simply think [colleagues] just pay lip service [to PRD], the vast majority. … I mean [MyGTCS] kept crashing, they were copying and pasting stuff four or five times and it never uploaded. It was extremely frustrating, and I can't find anybody who actually sees that it serves any purpose whatsoever, except to keep your registration up and to tick that box*."

Some of the leaders also drew comparisons with their knowledge of other professions and expressed concern about the lack of rigour in the PRD and PU processes. The GTCS professional standards also drew negative comparisons with How Good Is Our School? in that they lacked sufficient illustrations of expectations and good practice.

Bruce: "*[There is a] need for better illustrations around about the standards. You know, when [staff] are filling in their PRD and PU as to what actually is a sensible illustration*."

Some also exhibited a lack of understanding of the role of the GTCS in the PRD and PU processes expecting it to exercise a greater level of scrutiny of the professional learning records of teachers. That the responsibility for PRD is devolved to local authorities which then gives variation in practices also drew comment.

> James: "*Every local authority, and there are thirty-two of them, they have their own interpretation on what the [PRD processes] for teachers are. So, I find that unusual because the contract of the teacher is national, the expectation is national, the regulatory body is clear, and yet we have thirty-two interpretations. It shouldn't have thirty-two interpretations*."

There was a general view that PRD should be a useful tool for empowering the teaching profession, but that overly bureaucratic processes acted against this.

> Sam: "*I would have [PRD] much looser, so it feels owned by the person. And if the person said, I've not really done much in the way of courses, what I've done is I've spent quite a lot of time online chatting to other teachers with a similar set of issues, and you know, as a result of that I've changed this and that in my practice, then that should be enough*."

The implementation of PRD and PU comes across as promoting a managerial conception of professionalism rather than the transformative one promoted in many of the underpinning documents. This leads on to another important theme emerging from the data around empowerment, ownership and the role teachers play in decision-making for professional learning. This is related to the culture of organisations.

5.2.4 Empowerment and culture

Creating 'An Empowered System', including school leaders and teachers, and the encouragement of collaboration, collegiality and mutual respect is central to Scottish education policy (Education Scotland, 2022b; Scottish Government, 2018a). The word empower and its derivatives are used 49 times in the National Improvement Framework for 2022 (Scottish Government, 2021a).

Although there was general support for the concept in principle and the aim of devolving decision-making to the lowest appropriate level, several of the leaders interviewed expressed concern about the use of the term empowered.

> Emma: "*I hate the word empowered because it now means accountability in Scottish education, it doesn't mean empowered at all. As soon as you've empowered somebody you've actually disempowered them. So, I think it's the wrong word*."

> Ken: "*I think a lot … from Education Scotland is about the system, you know, the empowered system and I'm not sure that when I look at it carefully, how much explicitness there is about teachers exercising their professional judgment in an empowered way to make decisions about the curriculum, about pedagogy, about assessment and so on and so forth*."

How empowered individuals at all levels of the system felt was seen to be related to where both political and financial power resides. In terms of teacher professional learning, empowerment was seen to be dependent on the leadership culture of the school together with how well this culture supports the involvement of all staff in the production of the school improvement plan, and in its implementation across the school. Some leaders commented on observing good practice in some schools where teacher PRD and school improvement planning were well integrated but there were many comments about this not being the case elsewhere, partly because of the two processes running somewhat independently, and because of pressures on time.

> Peter: "*As a PT in a faculty with four or five colleagues to support you're not seeing a time allocation to support your colleagues' professional learning on a regular basis. You're not seeing as a teacher a time allocation to support your colleagues, of the professional learning of those around you, your colleagues. ... There's a cultural shift, a mindset shift required, and also structural issues to support that happen*."

There was support for professional learning for school leaders to promote the required culture shift.

> Kevin: "*We have to support school leaders; they have to have the confidence and capacity to run their schools in such a way that teachers are not getting frustrated and feeling that they lack agency or empowerment. That's the opposite of what we're*

trying to achieve, so if that's what's happening, then we need to support change. …. It's not straightforward stuff we're talking about, so we need to continue to support leaders."

Linda: "*I think there's a big issue around confidence of ownership of professional learning. … we've got a job to do in building the confidence and leadership to enable [good professional learning] to happen. … Making sure [school leaders] are confident and empowered enough to empower*."

Being empowered was something displayed very clearly by one of the school senior leaders.

Ken: "*These are two-year [professional learning] projects, and we're going to stand really strong together and say look, you know, to the authority, to any inspection or whatever. You know, this is what we invest in because these, we feel, are going to have such an impact on many other things that actually what you might think are improvement priorities will actually be fixed accidentally by this. But we're in a position where we can kind of afford to stand strong, and we can say look, this is what we're investing the time in CLPL in. So, the other things are either going to have to wait or they will be fixed, and I think it takes a certain type of school and a certain type of leadership*."

However, it was recognised that this was not always the case, and there was a strong view that both school leaders and teachers had to play an active part in all relevant processes for both the individual teachers and wider system to benefit.

Linda: "*With accountability comes responsibility. So there's an onus on an individual teacher to recognise the context that they're working in and the wider school priorities, so it would be naive to say, I think, you know, so the school priorities are X, Y, and Z, but actually I only want to focus on A, B, C this year, given that you have a role when implementing and leading X, Y, and Z. So, for me it's about really good line-management, line-manager conversations at regular intervals, intervals that don't always take place*."

James: "*I look at it like this, if, if the teacher turns up at their PRD interview because it is something they feel they have to do. If I don't do this then I'll get into bother, then that's not the right attitude to come. You need to come, both people need to come,*

to that meeting, the line-manager and the teacher, and they need to be both appropriately prepared, the line-manager for the conversation, the teacher for what they want going forward, how can I become a better teacher, okay. But if we're just going there because we did it last year and we need to complete last year's paperwork and start next year's paperwork that's not a PRD interview, that's a waste of two people's afternoon, and yes, you get a few of them."

In addition to teachers and their line-managers being well prepared and having an awareness of their context, and place within it, the importance of there being an open and trusting environment was highlighted frequently.

Linda: "*Teachers I speak too often feel that they're not trusted, both locally and nationally*."

Paul used a specific physics example of how hierarchical power dynamics can impact negatively on how open teachers may be in discussions about their professional learning.

Paul: "*If you have a lack of skills, let's say your lack of skills is in the radioactivity part of the curriculum, okay. It's quite hard often to talk to your more senior colleague, … and say actually, you know, the last two or three years I haven't been a very good teacher of this aspect of the curriculum, what can we do about it*."

Mitigating such situations does require a trusting environment with line-managers confident in leading good coaching conversations and teachers with the agency and confidence to both be open about possible weaknesses but also to challenge and argue back if necessary.

James: "*Then there's stuff on the school improvement plan and well, [teachers] need to be feeding back to your line-manager to say, look where did this come from, why are we doing it. Is it going to affect attainment and achievement in the school? You know, you need to be positive*."

However, it was clear that many leaders recognised many teachers were neither well involved in decision-making processes nor displayed agency.

Sam: "*Far too much [professional learning] was being done to us, far too much was being based on assumptions of what people needed rather than the approach that*

would say, well, where are you in your career, where do you see yourself going, and how do you marry those things together."

Stephen: "*It worries me that we're in 2021 and I'm still hearing colleagues the length of the country having their professional learning dictated to them*."

Bruce: "*I just think we are in danger of, or we have already gone through, a process of de-professionalisation. I think for some colleagues, … they are passive observers within their professional learning*."

The culture within parts of the education system does not always promote teacher agency. The ability of teachers to be empowered was also diminished by conservatism and accountability pressures as described by one headteacher:

Bruce: "*[A physics teacher] was really enthused by [CfE] and he spent years actually trying to develop better ways to capture the learning of young people in physics, particularly around the kind of National 4, National 5 interface, and he met continual resistance from the SQA. And they basically, you know, they actually rang me up in the end, the principal verifier and said, you know, it doesn't matter how many times he puts things in to be approved as being suitable for internal assessment, they are not going to be approved unless they are a closed book test, that is all we will approve. So where is the professionalism there, where is the empowerment there, because what he was doing was actually some really good stuff involving mind-mapping and capturing kids' learning in different ways, and the SQA were just no, we won't touch it. … you have to actually properly empower people and say, yeah, try it and give it a go and do something different rather than just pay lip-service to it*."

Several of the leaders considered supporting teachers to undertake enquiry activities as being important in developing teacher agency. They also saw this as empowering teachers to have a greater voice and it to be central in improving classroom practice.

Kevin: "*Self-directed enquiry based professional learning that, this is key, that is rooted in improving outcomes for kids. You know, so professional learning should be connected to improving outcomes for children and young people. … I mean it's all about enquiry and, yeah, around building it around the priorities for the teachers themselves and their learners and supporting them to take an enquiry approach. …*

For me teachers become empowered through enquiry because they become the owner of that professional learning. It gives them a voice that is hard to challenge because it's rooted in the voices of their young people and literature, and increasingly helps them to become, to have more agency over time ... So, I didn't always work in the most empowering hierarchies in schools, but as I became more confident as an enquiring professional I had increasingly the tools to argue back, but not in a complaining way, in a way that was evidence based, you know, so saying this is what I think because I've read this and I've tried this, and here's what happened and here's what the young people said, therefore, I think we need to do things differently. So, enquiry gave me that voice."

Professional learning culture is linked to the ownership of the professional learning and the role of different actors in decision-making. This was where many said tensions arise, and it is to these I turn next.

5.2.5 Tensions in professional learning ownership and decision-making

There was consensus on the importance of school improvement plans and that the production and implementation of these required a careful balancing of top-down and bottom-up inputs to minimise tensions and frustrations for those involved. School improvement plans are informed by the National Improvement Framework which is filtered through intermediaries in the meso-level. Some school leaders expressed concerns about some policymaking not being sufficiently well informed by those with classroom experience.

> Stephen: "*The disconnect between those who were making judgments and policy choices from the classroom, … that was put into stark relief for me. … the complete disconnect between those who are making decisions and where the decisions have to be actually actioned*."

The confidence of school leaders in leading and facilitating school improvement planning and related professional learning of their staff was identified as key.

> Linda: "*I have been really struck by the difference in confidence from headteachers. So, the really experienced, confident headteachers have been absolutely confident, … really clear about what current school priorities are and what they want staff to focus on. That is not always the case with newer school leaders and less confident school*

leaders who were still, I think, trying, I'm going to say, too hard, very, very hard to manage multiple expectations, you know, national, local authority, and the day-to-day stuff that was coming at them. So, I think we, we can and should continue to focus on confidence, on confidence building of school leaders because with a confident school leader and with really strong relationships across staff, this will be less of an issue."

Kevin: "*To me it comes down to the quality of leadership in schools and local authorities in terms of managing that bridge [between individual and national priorities]*."

Several leaders commented on the need for leaders to give teachers the time and space to lead their own developments, but that this can be difficult for leaders to do.

Linda: "*We need teachers to be able to work together on their own development, and on the development of learning and teaching. What we don't need, it might be controversial for me to say this, is more prescribed activity for teachers, we need to free up teachers to work together and that relies a lot on … trust and empowerment and ownership*."

Stephen: "*It worries me that there are, that there are so many colleagues in the classroom, at faculty level, at senior leadership, that feel that everything they do is dictated by the school improvement plan or the local authority improvement plan and they can't do what they want to do. I think that's a real tension*."

Balancing the use of limited time during in-service days and other collegiate time to meet the needs of teachers and national priorities was seen as being particularly difficult.

5.2.6 In-school collaboration and in-service days

Many leaders were aware of the need to make the most of the five in-service days and precious collegiate time given the huge investment in terms of staff salaries involved. Many acknowledged the competing pressures on this time, many unrelated to professional learning. They also acknowledged that the needs of staff varied greatly and therefore common programmes of activities resulted in some staff participating in things they did not meet their needs or require. Some school leaders were concerned that they were not always

able to manage activities and time in their schools as they wished due to local authority-wide initiatives and teacher contractual arrangements which limited flexibility.

> Stephen: "*You know all the Black Box stuff [holds Black Box booklets to camera]. I don't know, if there was a course on that type thing I could see a lot of folk been interested in that, but it ends up being things like Tapestry, it ends up being things like the big political ideas that the, our political class and others see as, look, we're having an impact across the whole authority here, and everyone has to do one of these courses, because Tapestry was supported by Dylan Wiliam and clearly that ties back to the Black Box. But it's making people do things, it's a tension with what I want to improve and develop and enhance*."

> Bruce: "*You've got the working time agreements, and things like TLCs go into your working time agreement time which is very much about what the school needs, but actually it would be better if that was used for what the member of staff needs, and really I would quite like to see some of the 35 hours that's there for individual members of staff being able to be allocated, or expecting them to allocate it, to something more formal because you can get the member of staff who can just make the argument that they want to read the New Scientist for 35 hours a year. … Actually being able to say that there is a requirement for you to do some collaborative learning with your 35 hours and have a national system of collaborative opportunities set up I think would help that hugely, because I think that is a real deficit because you have these two sometimes competing things happening and it's not clear which time is used for which. … Too many teachers … are kind of corralled into something that is not really relevant because it's what the majority wanted*."

Bruce's comments illustrate that difficulties can arise if professional learning time and purposes are too compartmentalised.

> Elizabeth: "*If you've got a certain proportion of collegiate time that you've set aside for professional learning it shouldn't all be based on what you as the lead are saying is the need. It has to be actually, I'm going to balance this out, you know, we're going to look at these particular priorities this term and this proportion of the time for professional learning is for, is for your needs to be met. You know, it needs to be that balance, and I think sometimes that's where there can be that sort of potential tension*

in terms of it's almost the expectation that your individual needs will be met outwith that time."

Fiona: "*I think the biggest tension is often what happens in school because the time to learn together in school is limited in terms of, you know, there are only a certain amount of in-service days and how they are employed, and so on, but I think the key thing, I think, is the planning of neither should be done in isolation. You know, it is coming back to leaders in schools should be involved in professional learning cycles with all their colleagues. They should know their colleagues well and their professional learning as well*."

For good use of the limited available time, it was seen that the active involvement of both teaching staff and school leadership in the planning and delivery of professional learning was important. Some pointed to using the National Model of Professional Learning as a guide.

Peter: "*I would look at the model of professional learning, which I think has a lot in it. It epitomises that idea of your learning as a collaborative enquiry, a collaboration with your colleagues*."

Kevin: "*If you're planning in-service days with the model of professional learning in your head, you might do it a bit differently*."

Some school leaders demonstrated agency in how they used the time available, looking to research evidence beyond any available from local authorities and Education Scotland, and resisted local authorities implementing programmes for all teachers.

Ken: "*I think for us, everything that we do is driven by educational research. So, we are, we will only do something if we can evidence that there's, that there's research-based evidence, and that's, that's a really consistent message, particularly with a focus on teaching and learning. So, in terms of individuals and us as an institution for professional learning, there's a big focus on subject knowledge and understanding. Pedagogy is a massive driver*."

Sam: "*[The local authority] spent an awful time and money on the John Hattie stuff. And whilst there's a lot of good in that, for the amount of time and money that you have to invest in it, is it ever, you know, I don't know. I see a lot of good in it, but I'm*

not sure. We stepped back, our cluster, we were signing up for a five-year commitment to it, and I held back from putting in the secondary school into it because I just thought that would be every in-service day, that would be for every member of staff, for every opportunity that exists there. Yes, it may be good for some but for many it's not what they need right now. The authority went full tilt at it, but I don't think that is the way."

In-service days and collegiate time were well recognised as the main opportunities which allow staff to come together within and between schools, although it was recognised that it is not always perceived as such, and time is not always used wisely.

Elizabeth: "*School collegiate time with in-service days [is] a good opportunity to get people together from a wider area, whether it's within the school or cross-cluster or cross-authority to actually come together to do something that's a collective need that's been identified*."

Bruce: "*There is a perception that in-service day is there as catch-up time, whether it's writing your reports, whether it's sorting out your drawers, or whether it's preparing for the rest of the term*."

Paul: "*I'm not a great fan of generic in-service days because I'm not sure that they're really professional learning*."

Fiona: "*I think the big thing here, it is about ownership and about meaning, and about understanding why they want to do it. And, whereas if you just come in on a Monday morning and you've got an in-service day and here's the agenda, and this is what this is going to be, and you're thinking, you know, IDL [interdisciplinary learning], actually we've got something quite good going in our faculty for this already, you know, well, why are you not up there presenting it then? … Think about the things you have to do on the first day back every year, you know, and the teacher who has been there 20 years is saying, do I have to do this again, you know, I could be doing so much*."

Many leaders were concerned about the current use and impact of in-service days and collegiate time. This raises the issue of what role meso-level organisations might best play in supporting professional learning so that impact is maximised.

5.2.7 The role of local authorities and regional improvement collaborative

Despite the potential for a coordinating role for meso-level organisations, a simple lack of coherence and coordination was frequently given as an obstacle for greater collaboration, this included between neighbouring local authorities in the Northern Alliance.

> Bruce: "*We now no longer have any coincident in-service days. It makes it very difficult to [collaborate] when we have no time to do it, and to me it's a clear deficit that we allow the local authorities, and it's not just that we allow it but they have such inertia about making a change like that, and their timescales for doing that, and their cycles for doing it are all out of synch so it is becoming an almost impossible position to get some coincident in-service days without something happening nationally to decree these days*."

The large and diverse geographical area covered by the Northern Alliance was seen to be a barrier to it functioning well.

> Emma: "*Who thought the Northern Alliance was a good idea? From Argyll and Bute all the way up to Shetland. It's like, who thought that was a good idea?*"

> Sam: "*We are quite a diverse RIC in the Northern Alliance, a very diverse RIC in the Northern Alliance. That's one of the difficulties, the needs of Aberdeen City are different from the needs of Argyll and Bute and so on, so it's quite a difficult thing to pull together*."

The move to online working, accelerated by the COVID-19 pandemic, was seen to have improved support in some areas by building online networks.

> Mary: "*The regional improvement collaborative of the Northern Alliance, for example, has actually flourished in this time because they have had to move things most definitely online and be able to get groups of people working better together*."

However, many leaders expressed some concerns about the role of the RIC in relation to local authorities and the additional layer they had added to the education system.

> Sam: "*I would worry that the RICs put a layer into the system that is an extra layer without taking layers out of the system somewhere*."

> Fiona: "*I think a lot of this [tension] is about people understanding why they're doing something, or why they're being asked to do something, and if it's the school wanting to know why the teacher's doing it, asking them about it, and if it's a teacher wanting to know why something's a priority for the school or the faculty, asking them. So, really it comes down to that coherence between regional or, you know, authority, school intervention and that understanding. And I think of where there's still a lack of understanding is probably around the purpose of that regional working, that strengthening in the middle, if you like*."

Local authorities, with a governance structure of elected councillors and funding raised locally, and national government were seen to have both political and financial power in a manner RICs do not. They are largely reliant on local authorities ceding power to them, something further complicated by the eight diverse local authorities comprising the Northern Alliance. School leaders still looked towards their local authority for guidance and support rather than towards the more collaborative cross-authority working provided by the RIC. There was general concern at the duplication of effort across different organisations and the need for better alignment between them, again related to issues of power and trust.

> Sam: "*There's a fair bit of alignment between what we are all trying to do but we're not smart enough at connecting the dots really. I think we could do that an awful lot better than we do, and that's because each of us has got a kind of self-interest, a vested interest in what we're doing and so there's, you know, there's bits where there is not enough collaboration between organisations to jointly run something, and so, I think that could be much better. That comes down to aspects of leadership, and aspects of leaders, leaders at every level trusting people at every other level*."

It was also recognised that the RICs were relatively young and the pandemic, whilst helping promote more effective online working, has disrupted other activities, including the support of coaching in schools.

> Fiona: "*One of our key offers that hasn't happened [because of COVID-19], was we were going to provide an opportunity for a dozen members in every local authority to undergo three-day facilitator training, which was around adult learning, design, theory, you know, putting it into practice. … if every local authority had some of their officers, some of their headteachers, some people who had responsibility for*

designing and delivering professional learning for others in a programme like that then we would be flying, because the idea was then we would have this pool across the Northern Alliance of people who have a responsibility for planning and leading professional learning, they have the knowledge of what's happening, they have the knowledge of what's needed, and then they have the skills to plan and design it and facilitate it."

Nevertheless, despite such disruption there was some evidence that some of the leaders considered headteachers were increasingly aware of the role and work of the RICs even if this had not yet worked through to classroom teachers.

Linda: "*I remember doing a session on [RICs], and headteachers saying, we don't really know anything about this. A couple of headteachers would put their hand up and say, yeah, we know it, we've heard a bit. A year on school leaders were saying, actually we're much more involved now, I was involved in shaping the plans. A year on, further involvement, but at the same time, when I was speaking to class teachers they were saying, we don't know anything about the RICs*."

That neither local authorities nor the RIC provide well for the professional learning needs of classroom teachers was brought up by several leaders, especially school leaders.

Bruce: "*I don't feel that the things that are there locally within the local authority or RIC level, or national level, are actually fit for purpose. They are too big, or they are too vague, or they are not actually written from the perspective of a teacher engaging with them*."

Ken: "*In terms of the authority and the RIC and that, I suppose I have to put my hand on my heart and say in terms of professional learning, [there's] very little. A lot of what we use is school-based to be blunt, … stuff that we've generated ourselves*."

Nevertheless, RICs were seen to be in a good position to coordinate activities and networking to enable both improved communication and economies of scale not available within individual local authorities where specialist staff may be distributed quite sparsely. However, the question of ownership and leadership of networks remained an unresolved issue for many.

> Billy: "*I just think that that there needs to be that opportunity for people to network. And I know the Northern Alliance is trying to do that because local authorities are kind of overrun at the minute, there is not enough officers to do everything. So, they're trying to facilitate those informal networks, there's a DHT network, and there's some subject networks, but then the question is who leads that network, you know, who puts out the meeting invites, who puts the agenda together, do you need minutes, is it just a cup of coffee and a chat for half an hour. It's these sorts of questions that drive that, and I think some of the most supportive meetings that I go to are ones where you just go and have a chat with folks, and there's obviously there's an agenda of sorts, where you discuss issues but there's a bit of how are you doing, and this kind of thing*."

This therefore raises the issue of how the professional learning needs of classroom teachers may be best addressed. The leaders were asked to identify the professional learning journey of a typical classroom teacher, and the purpose and ideal blend of professional learning for teachers and it is this I address next.

5.2.8 Classroom teacher professional learning

Many leaders referred to the need for teachers to improve their pedagogy, to deepen knowledge of the subjects they teach, and to keep up-to-date with curriculum and other developments in education, using terms such as 'to enhance your craft', and 'to deepen your understanding of your classroom practice'. Leaders also acknowledged that teachers can, and should, continuously improve regardless of experience or where they are in their career, all with the aim of improving outcomes for learners.

The needs of probationer and early career teachers were seen to be different to those of the more experienced. Generally, the support mechanisms for probationers were seen to be good, although improved support for their mentors was identified as a need by several, reflecting the wider concern about a lack of support for teacher educators. There were concerns about the reduction of support for teachers as they move beyond probation where professional learning and mentoring opportunities can be highly variable but when teachers can still have significant needs.

Kevin: "*I think one of the tensions I often find is that we say that the standard for full registration is a benchmark standard, you know, you've passed it if you're in your first-year post-probation. And yet we also say it's developmental and everyone's developing against it. I actually agree with the latter of those statements, you know I think, I think it's a challenging standard, and I think when most teachers achieve it, you know, there's still a lot to do to really become really confident in all those different areas*."

Emma: "*I really like the notion of ITE, then into probation, then into an early career phase that finishes after five years, and you only actually become a "real teacher" [air quotes] when you hit your first PU, and up until that stage you're continually supported*."

Providing continued support of this nature would be consistent with the literature about early career teachers discussed in chapter 3.1. Some of the leaders also reflected on their experiences of how professional learning has changed in recent years, and how the focus needs to continue to change.

Linda: "*I would encourage early career teachers to continue to focus heavily on pedagogy. I think that's something that, historically, if you look back 10-15 years, I think we were really light, Stuart, around the skill of teaching, and I think often new teachers jump in, you know, straight from ITE and feel that they need to be expert teachers already. And I think there's a much stronger movement now around pedagogy being an important focus. So, pedagogy, classroom practice, the skills around leading learning and teaching, so the planning, the assessment, that aligns with that. At that early career stage, and further on, I would be encouraging people to continue to focus on subject knowledge. And again, I think 10 years ago it was something we were really light on*."

James: "*As a teacher, there's always two things you need to do, there's stuff that you need to do for your specific subject, and the stuff that you need to do to keep up with current developments in education. I worry that the current developments in education gets too much of a focus and we're losing the specific subject specialists*."

After the first few years in teaching many leaders saw it as important that teachers, as well as continuing to keep up-to-date with the areas mentioned for probationers, develop interests in other areas such as additional support needs, and different leadership roles, both formally and informally. Many leaders also wished to see teachers become more engaged in practitioner enquiry and more self-directed professional learning as well as being able to access specific professional learning to address any deficit regardless of when this is first met in a teacher's career, such as when first teaching a visually impaired child.

Many of the leaders, including all of those holding the most senior system leadership roles, considered there needed to be an increased emphasis in teacher professional learning on improving teacher knowledge in pedagogical content knowledge and curriculum-making, something they saw as having been lacking in recent years. This therefore raises questions about how teachers access good quality subject-specific professional learning when little in-service day or school collegiate time is used for this. The next section explores the leaders' thoughts on this.

5.2.9 Subject-specific professional learning

Several leaders commented on the reduced focus on curriculum and the role of knowledge since the introduction of CfE, and as the OECD highlighted (OECD, 2021), this imbalance ought to be addressed.

> Linda: "*We didn't have a focus on, on pedagogy and curriculum knowledge at the launch of CfE. If you were advising any country about education reform, curriculum reform, a strong piece of advice that I would give having lived through all of that is that any changes to the curriculum has to be accompanied by really high quality deep professional learning. I think that was a big mistake*."

This change in emphasis in curriculum development has therefore influenced the emphasis in teacher education.

> Mary: "*I came through at a time where really understanding curriculum was very, very important, you know, so I have a strong basis on curriculum that I'm not sure that many of today's graduates coming into the profession have. And I think that reading into the OECD report is something else that is there about the need to have a real understanding of curriculum*."

Emma: "*One of the things we have totally lost, … is who supports you with curriculum areas*."

Some of the leaders identified that the move from subject departments to faculties has weakened the subject-specific support available in many schools, especially for early career teachers. Several leaders wished to see a change in the production of curriculum development resources and associated professional learning.

James: "*The curriculum by its very nature is a changing thing, we need to make sure, and it's the 'bag of tools', we need to make sure the teachers have the bag of tools, because if you want to give the ownership of my classroom to allow me to deliver in my manner, then you don't need me tied up like every other physics teacher in Scotland developing materials and taking up hundreds of hours. Those hundreds of hours can be far more useful in terms of my development and improving of the classroom environment for the pupils, because my teaching environment is their learning environment and the best resource, you can give me all the money in the world, but the best resource in the world is an experienced, well qualified, confident teacher*."

Such a change would free up time for teachers to focus on improving pedagogy and the experiences of the learners. Several leaders suggested strategies, often involving collaboration, which might be used for this.

James: "*Why have everyone writing the same stuff at the same time, how wasteful of time is that? And that maybe means one of the curriculum development areas is to develop from our current teaching force people who are good at developing curriculum materials. You know, so we need to give them the skills to do it*."

Peter: "*I would hope in areas such as curriculum that the RICs and the RITs [regional improvement teams] might have some potential to do some, to do development in areas such as curriculum and understanding the curriculum and notions of how you can develop it would be an area the RICs and RITs could move into, right. But in terms of … subject support, I don't see that coming through there because there isn't the capacity in either of those organisations, but there is the capacity to support the professionals within a subject area or a faculty area, yeah, or a stage, you know, that*

there is the support to do that, and some of the RICs and RITs have combined together to do that. And you've seen, you've seen that to a certain extent through the work of e-Sgoil and some of the national e-learning developments as well."

Ken: "*I think, certainly talking to ordinary classroom teachers, they would really appreciate cross-authority subject groups. But then again, the practical problem of, you know, who becomes the leader for that, and then, you know, how do you fit that into all the other priorities that that everybody has*."

Elizabeth: "*I think the important thing is having that protected time and opportunity to actually meet with their opposite numbers in different schools. So, for example, you know, you've got your subject curriculum groups, things like that, having that opportunity to come together. When those are in place, and those are working well, and those have a focus, what you see is a group of teachers who come together, and they make use of the expertise within the group to drive forward their professional learning as a whole*."

Bruce: "*The likelihood in a school, or even in a small local authority there are potentially a limited number of people who are in that same group, and I think teachers working together in groups is really, really important, and it's particularly important in … the more remote places where actually having access to like-minded people could become more difficult. You know, I think what is really important is to provide the right quality of time, and there needs to be regular, and when I say regular, I also mean frequent, you know, 3 to 4 weekly sessions where you can actually get together and talk about what you are doing*."

Paul: "*Looking forward, maybe someone has to say, like everyone has to do a certain amount of real professional learning in their subject, you know, on a regular basis. And that's what, that's what people, I would hope that the majority of teachers would want to do*."

Prioritising time for well facilitated subject support groups was seen to be important, but also that these should be kept focused and prevented from just being a time for teachers 'having a bit of a moan'. However, if such groups could be made to work well, some saw these as likely to be better received than more generic professional learning.

Billy: "*I think sometimes professional learning is offered to folk and it's, it's a bit generic, and it's a bit like, say for example stuff on Growth Mindset. You know, a lot of people think it's a bit like snake oil*."

There was concern amongst some leaders that the professional learning needs of teachers were not sufficiently well understood and that there was perhaps a need for more structured programmes to support teachers become a better teacher of their subject and improve their day-to-day classroom practices.

Mary: "*In the days when we did do needs analysis, I was always quite amazed sometimes of what was coming through loud and clear that actually wasn't something, you know, I particularly, or some of my colleagues thought was what teachers were actually wanting*."

Kevin: "*Sometimes I worry I'm in some sort of fairyland of, you know, that a lot of teachers listening to this would think, what planet is he on, like that's not what we want*."

Emma: "*Has anyone actually ever asked teachers what they want? [With] universities, actually if you give teachers what they want, they would actually give you money to do it, it doesn't make sense not to*."

Stephen: "*There was definite issues with the reality of the chartered teacher, but we don't have anything like that so we're reinforcing through any university course that the only way of enhancing your practice is to get a promotion, and that's, and that's insulting*."

Ken: "*I just feel that, you know, not that many people do want the responsibility of being a PT or whatever, but if there was a very clear route where you could build your knowledge, you could motivate teachers, you could develop their techniques, you could embed their practice, it was very clear cut through their subject area or through a particular specialism with a particular group of children with certain needs. I think that would just help inform and motivate classroom teachers with their CLPL and it would also, I think, help leaders to think a bit more carefully about what are the improvement needs in terms of teaching, learning, and assessment for their school and how can you achieve that*."

The use of enquiry in professional learning was also seen as very important by some and, with a high trust environment, an enabler of teachers developing agency and a voice in terms of them compiling a flexible programme of professional learning micro-events which meets their needs well and could be focused on improving pedagogy in their subject(s).

> Kevin: "*You need to develop all teachers and school leaders to be enquiring professionals, that you have to actually, you can't instruct people to become enquiring [laughter]. You have to support them to become enquiring. Then you do need a menu of offers, you know, there needs to be enough different offerings out there that meet the demand. And that could be a mixture of courses, self-directed online learning activities, access to literature and other sorts of reading. But you also need trust. So, and … teachers need a certain amount of time that they can then do these things, and that won't all be the same, as not everybody will be doing the same thing at the same time. So there has to be an element of flexibility in terms of how time is used and an element of trust that the teaching profession, as professionals, are you know, can and are taking forward their own professional learning in time that is allocated to it*."

Despite their respective roles in supporting professional learning for teachers, it was clear that leaders considered there to be some way to go before the system supports teachers' professional learning needs well. The next section explores why needs are currently not being well met.

5.2.10 Barriers to professional learning

The identification of barriers to professional learning tended to come up throughout leader interviews, as can be gathered from many of the quotations above. When coding the transcripts, it proved to be the code with the greatest number of entries. As evidenced in the previous section, there was general concern about the availability of appropriate professional learning which meets teachers' needs but there were also some quite pointed comments from some.

> Emma: "*If you are talking about personal barriers, I think my biggest thing is the creativity and the lack of different opportunities for people. I think it should come from Education Scotland, but at the same time they're not really pushing that agenda.*

… if they are the global professional learning arm for Scottish teachers then what professional learning are they offering me? Coaching, what else? Leadership, what else? A void, a void of other things … there's nothing else there in their offering that I would go, oh, I would love to go and do that. You know, as a science teacher, what are they offering me? [shakes head]"

However, even when good provision exists there are barriers preventing teachers access it. Lack of funds and lack of available cover staff, which perhaps most affects those in more remote areas, were seen as an obvious barrier to participation in professional learning external to schools.

Mary: "*I certainly think from the rural point of view, it is about that rural isolation, and it is, you know, that you very much would find that perhaps there would be a difficulty geographically of accessing some of these activities in rural areas, and you know, universities, for example, that there can be a great difficulty in doing that … if you were going to a national conference in Glasgow let's say, or even a course in Glasgow from an island, it may have taken you three days, or it could have taken you the week to actually do that one day. So, the cost that comes with that is enormous for the school and the school then may have limited input to these kind of national conferences that other schools could allow staff to go to much easier*."

In times of austerity, local authority funding for professional learning was seen to be an easy target. Opportunities for economies of scale were also seen as limited as funds are often devolved to schools. The capacity for local authorities to support professional learning was considered to have diminished as the number of officer posts had been cut. It was also acknowledged that when prioritising the use of scarce funds, teachers themselves would likely favour the use of funds for addressing immediate teaching and learning priorities rather than potentially longer-term professional learning ones. With many competing demands, prioritising time for professional learning was seen as being difficult, as is time to then implement any new learning or to disseminate it more widely.

Fiona: "*I think at the moment, particularly when people are busy their time is so precious, time is always precious, but at the moment I know that colleagues of mine are struggling to get to professional learning sessions and collaborative sessions, and so, therefore, if they are making the time to come out to do something particularly, it*

needs to be purposeful and meaningful, and it needs to really be something that's directly applicable for them, and they can use it, because that's the other bit I think as well, is we know that if people don't go away and put it into practice, what they've learned within two weeks, really the likelihood of them doing it starts to fall significantly."

Emma: "*If you speak to teachers, the first thing they say is I don't have the time to do it. I often argue that time is not actually the issue, priority is. And people tend to do the things they are measured on before they do the things that they would want to do. So, … we've got a performativity and accountability agenda going on, so people spend their time doing things for other people rather than doing things for themselves*."

Accountability agendas were considered to make the system more bureaucratic and to stifle innovation, creativity, and empowerment. There was evidence that some professional learning opportunities were subverted due to micromanagement and accountability pressures which diminished the quality of professional learning possible.

Sam: "*I was involved in the writing of some of the stuff about subject networks in [local authority]. I was very keen that we almost didn't have an agenda, that they would be more like the TLC sort of idea, more like those self-sustaining communities, but too often the authority was insisting on the agenda being a controlled one, being a defined one, all of the networks having a similar one. They used the networks to gather data about how CfE was being implemented across the schools rather than thinking about, let the teachers get together, let the teachers come up with where they are at and what they are needing, and you know, and then giving that network a little bit of time to develop their own solutions. So, it became very frustrating*."

There was also concern that How Good Is Our School? was being used in place of the GTCS professional standards to shape teacher professionalism. The emphasis on accountability and performativity rather than empowerment and agency is likely to contribute to an apparent anomie and an unwillingness to take full ownership of their professional learning which was alluded to by some of the leaders regarding some teachers.

> Mary: "*Something that surprised me a little bit was essentially how little vision to the future many [teachers] actually had about where they might go and what they might have to do in order to get there*."

This provides evidence that many teachers were used to working in a culture where they did not feel empowered or able to exhibit agency but were compliant, expected to be directed from above, or felt that there was little point engaging as they considered it would likely make little difference to their priorities or futures.

5.2.11 Summary

All leaders desired to see professional learning be transformative. Several advocated strongly for enquiry-based professional learning at the transformative end of Kennedy's spectrum of professional learning (Kennedy, 2014), or masters-level study or coaching with the potential for transformative change, whilst acknowledging that these were difficult to implement at scale. Throughout the interviews there was also implicit, and sometimes explicit, acknowledgement of the difficulties in ensuring many of Timperley's principles for professional learning (Timperley, 2008) were in place simultaneously. It was clear that leaders considered there was still much work to be done before professional learning meeting these standards was widespread and seen as normal professional learning behaviours with enquiry embedded as stance.

I now turn to investigate the lived professional learning experiences of physics teachers across the north of Scotland. The reporting of the teacher participant findings begins with a description of the pilot of the teacher participant interview process before going on to report on the more extensive data collection.

5.3 Pilot of the teacher interview and roadmap process

As described in the methodology, I decided not to incorporate the findings from the pilot interview with those from later interviews due to the changes made to the interview schedule and roadmap procedures because of the pilot. However, Calum did provide relevant data, and a summary of findings about his professional learning journey is therefore given below, separate from the reporting of the findings from the other participants given in chapter 5.4.

Calum was able to draw upon his memories from a teaching career lasting almost 40 years. Although a long time ago and difficult for him to remember clearly, he considered there to be less emphasis on professional learning, and less of it available in the 1980s and 1990s than there has been in the subsequent two decades. The main professional learning during these first two decades was in-service day events for physics teachers organised by the science advisors in the regional councils then responsible for education. However, from around the year 2000 he considered there to be "*an avalanche of CPD training*" compared to previously. He credited these changes to political decisions made towards the end of the 1990s, including the formation of the Scottish Parliament and education becoming a devolved responsibility, which is consistent with the discussion of professional learning policy in chapter 2.3. Around this time the curriculum and assessment changes associated with the Higher Still programme which revised post-16 qualifications also resulted in professional learning events for teachers. These have also occurred to a lesser extent more recently for the equivalent changes to National Qualification courses in the Senior Phase due to Curriculum for Excellence. Calum also identified the formation of the Institute of Physics Teacher Network in 2003 as significantly increasing the amount of subject-specific professional learning available as well as a wider offer from SSERC and some other organisations.

When probed on what professional learning Calum found most useful and of the greatest impact on his professional growth, he was unable, or unwilling, to provide detailed specific examples but referred to the professional learning which he considered to be most worthwhile to be that which could transfer immediately to improved practices in the classroom as illustrated by this statement:

> Calum: "*the ones where you ... get a sort of a light bulb flashy thing, hey, yes, I can actually use that in the classroom. I think I could walk into a class next week and put that into some of my teaching and learning and that will actually have an impact on the pupils. That's the ones I always think are excellent.*"

The professional learning record provided by Calum was dominated by conference or workshop events. The only exceptions to this were his attendance of some committee meetings and the completion of a few MOOCs (Massive Open Online Courses). Calum had not identified any more informal professional learning such as discussions or working with colleagues. He had identified that attending some of the events listed had provided good

networking suggesting he valued such informal opportunities for discussion, and in some cases had found that more beneficial than the formal content of the event. When probed Calum also spoke about other professional learning activities not documented in his roadmap list. He indicated that he undertook private reading to improve his background knowledge of physics and pedagogical issues. He also spoke about the benefits of meeting with other physics teachers from the other schools in his local authority and initiatives in his own school such as peer observation of and by colleagues from other subjects. He indicated that this was very valuable and encouraged by the senior leaders in his school through formal procedures within his school. He did consider that the support from his local authority for professional learning, both in terms of attending external events as well as for within and between school networking, had been very good in the 2000s but due to financial restrictions, including the reduction of local authority staffing levels, this had diminished greatly during the 2010s.

When asked about professional learning opportunities he would like to undertake but had been unable to, he stated he thought there was no encouragement or support for teachers to complete advanced study to diploma, masters or doctorate-level and he would like to see this. He had completed a Diploma in Education as part of his initial teacher education, which he considered to have been a very worthwhile experience. Then early in his career he had begun a part-time distance learning Masters in Education degree but withdrew after the first year due to work/life balance issues. He would also like to see improved support for the networking of teachers between schools, particularly in rural areas, and this would benefit from the central support of local authority staff with a clear remit and time to properly support such professional learning activities, illustrated by the following:

> Calum: "*There's no real central coordination or support nowadays. In fact, if it wasn't for organisations like the IOP, physics teachers or a lot of teachers would be very impoverished in their CPD. I just don't know where they would get it.*"

When exploring modes of professional learning activities, Calum did not think that informal discussions with colleagues, whether within his department or further afield, or with people outwith the more formal education system, could likely lead to professional learning opportunities or any professional growth. This demonstrated his narrower definition of professional learning compared to my own and the importance of this part of the interview

as a training exercise if I were to get teachers like Calum to complete the subsequent diary-log adequately. Calum did consider all the other modes of professional learning listed, see appendix 7, as providing opportunities for professional learning with activities such as formal working with departmental colleagues, peer observation, attending physics teacher network meetings, and both providing, or being the recipient of, coaching or mentoring as opportunities for "*rich discussions of teaching and learning*". He did not identify any other activity as a potential professional learning experience.

Calum was then asked to describe his ideal professional learning journey for a physics teacher over the next few years. As this pilot interview took place in December 2020, at a time when face-to-face professional learning had already not taken place for nine months, and it was already clear was not going to do so for some time, this question was framed in the context of there not being any restrictions due to the COVID-19 pandemic and Calum sought clarification this this was an idealised 'wish list' rather than one taking into account the very real restrictions at the time. Calum had clearly thought about this question ahead of the interview and concisely identified the following list of professional learning activities:

- Good relationships with school colleagues and mechanisms in place to allow activities such as learning visits and peer observation.
- Regular meetings and good networking with other subject colleagues in the local authority or schools nearby to discuss teaching and learning of the subject.
- Opportunity to attend at least one national or international conference per year giving the opportunity to meet with people from different backgrounds and with different experiences.
- Encouragement and financial support to undertake additional qualifications such as masters courses.
- The maintenance of an online professional learning offer, beyond the COVID-19 pandemic, allowing teachers to dip into professional learning at times convenient to them.

Calum identified the need for the content of the professional learning to be a blend of both subject-specific and generic:

> Calum: *"I like a variety ... whether it is very subject-specific like how to teach National 5 electricity or very general like, you know, what sort of environment do teenagers*

> *learn best in, and what can we do to provide realistic and relevant assessment, to finding out a bit about gravitational waves and a whole variety of things I think we need to do. Subject-specific skills, general pedagogical skills, keeping up to date with new content, a whole load of stuff.*"

When asked about the time needed for a teacher to undertake this idealised set of professional learning activities Calum did not think there needed to be any change in teachers' conditions of service including teachers completing 35 hours of professional learning per year. He acknowledged that the 35 hours was a "*very notional thing*" but clearly did not think it likely that the Scottish Government, local authority employers, General Teaching Council for Scotland, or teacher unions currently had an appetite to negotiate a change and that the 35 hours was a "*sensible figure*" anyway.

When asked which professional learning policy documents he used or referred to during his work Calum said the only ones were the GTCS professional standards, and he also indicated that he thought these were the only policy documents other teachers referred to and could not identify or name any other policy documentation, national or local, relevant to professional learning. The reason he gave for referring to the GTCS professional standards was that Professional Review and Development (PRD) and Professional Update (PU) were closely tied to the GTCS professional standards. Calum had recently gone through the PU process and was disappointed that he had received no feedback on the information he had submitted either from his line-manager in the senior leadership team of his school or from the GTCS. As a result, he considered the PU process "*very much a tick-box exercise*".

He concluded by saying that he thought that the provision of career-long professional learning was very dependent on the political and financial situation in the national government and local authorities and that "*it's almost like [career-long professional learning] is seen as a nicety that can slide off the table if there is not the money or time for it*." Calum's responses helped shape subsequent interviews, see chapter 4.7.2, and he also completed a diary-log and follow-up interview alongside the other teacher participants.

5.4 Teacher findings

Each of the initial interviews began with teachers summarising their career to date and, using their roadmap as a guide, a discussion of the most significant professional learning events or

activities they had undertaken. This inevitably resulted in a focus on the positive professional learning they had experienced but during the interview discussion it was also possible to explore professional learning they had experienced or had been obliged to undertake which they considered to have been less worthwhile or impactful on their professional growth. This approach meant that in almost all interviews there was a chronological element to the answers given and this frequently started with participants discussing their initial teacher education, probation and experiences of mentoring before going on to other professional learning experiences.

Following this initial interview, the teachers completed a diary-log of their professional learning for a year before I interviewed them again. These interviews proved to be more extensive than initially planned but this did allow clarification of the reliability of the diary-logs, direct investigation of the use of policy documents, and more general discussion of their professional learning experiences during the previous year. Overall, these experiences were broadly in line with those discussed during their initial interviews. However, the period had been disrupted by COVID-19. Compared to pre-COVID-19, many in-school meetings had not taken place or were conducted using video conferencing and participants reported that this resulted in many of these being less interactive than in-person equivalents. School staffrooms tended to be closed which resulted in less informal professional learning with colleagues, something highly valued by many teachers.

> Clara: "*The staffroom is just not being used. That's actually a miss, that's actually where a lot of your learning can come, you know, whether it's learning to do with pupils and circumstances, and you know, it's just that element of connection, connecting with pupils via other staff. It has kind of deteriorated or just broken down*."

The diary-logs, although not always completed fully, nevertheless provided a good focus for discussion with the teachers, much as the roadmaps had previously. These interviews allowed me to check on the contents of the diary-logs and to probe areas of particular interest, such as their use of policy documents, enabling me to compare more confidently the views of the teachers with those of the leaders.

As had been the case for Calum, during the initial teacher interviews many of the participants had a relatively narrow working definition of professional learning. Despite almost all the participants considering all fifteen of the modes of professional learning, see appendix 7, as

opportunities for professional learning, and my encouragement to recognise informal as well as the more formal opportunities, this remained an issue for many when completing their diary-logs. For example, during the follow-up interview, Dani, who considered being coached to have been most impactful on his professional growth said, "*do you count coaching as professional learning, I'm not sure*". Fortunately, he had included all his coaching sessions in his diary-log.

Despite initially completing her diary-log very comprehensively, due to workload pressures exacerbated by assessment requirements during the COVID-19 pandemic, Ava withdrew from the study after three months. Neal had only listed a few entries in his diary-log, partly due to family circumstances which had disrupted his ability to complete professional learning for part of the year, but also during his follow-up interview it became clear he had not entered all his professional learning including a significant amount for a subject he taught other than physics or any professional learning within Working Time Agreement hours. Therefore, for the quantitative analysis of the diary-logs only those from the other ten participants were used, although the transcript of Neal's follow-up interview was included as a data source. Due to illness Andrew also had a period during which he had been unable to participate in professional learning activities outwith his normal school day which had impacted on the amount of more personal professional learning he had been able to undertake, including the masters-level study he had expected to do during the year, however, he had nevertheless undertaken significant professional learning and his diary-log was included in the quantitative analysis.

I begin by exploring some quantitative analysis of the teacher diary-logs followed by themes that emerged from the analysis of both the initial and follow-up interview transcripts. The follow-up interviews provided additional detail to the initial interviews in a complementary rather than contradictory fashion.

5.4.1 Quantitative analysis of the diary-logs

Few, if any, of the teachers completed the dairy-logs as intended, but once the follow-up interviews were scheduled this prompted several to add entries and complete some of the refection asked for, although several of the teachers acknowledged their diary-logs could have been more extensive. The follow-up interviews highlighted that the diary-logs were likely to be an underestimate of the professional learning undertaken, especially of the more

informal instances such as learning with and from colleagues. Many considering this to be part of lesson preparation or curriculum development rather than including professional learning as exemplified by this comment, none of which was recorded in the diary-log.

> Albert: "*Myself and one of my colleagues had put a lot of effort, … we basically rewrote the entire third year physics course to fit in with the more appropriate level outcomes, …. So, there's been development there. But it was sort of one of those jobs that needed to be done. So, yeah, that was a lot of lunchtime chat*."

The ten participants providing adequate quantitative data reported a mean of 49.6 hours of professional learning (range 26.7 to 71.8 hours). Of this, 22.1 hours was during school-based or directed time and generally within the teachers' Working Time Agreement (SNCT, 2007). The remaining 27.5 hours was more personal professional learning generally undertaken in teachers' own time. However, these means hide a significant difference between two subgroups.

Subgroup 1 consisted of Andrew, Dani, George and John. John's school, based on its school improvement plan, had an extensive programme of internally organised and led professional learning on two well-focused themes. Dani and Andrew worked in schools which were taking part in the *Excelerate* (The Wood Foundation, n.d.-a, n.d.-b) externally supported whole-school professional learning programme promoting project-based learning (PBL) and both had significant roles in this within their schools. These three reported significantly different attitudes towards, and use of, school-based professional learning than all other participants. Dani had also participated in a programme of school-supported coaching. George had also benefited from weekly mentoring meetings, due to having to teach mathematics because of staff absence. These four participants reported participating in a mean of 39.3 hours of school-based/directed professional learning compared to a mean of 11.1 for those in subgroup 2. However, their mean total hours were similar, 50.8 hours, compared to subgroup 2's 48.7 hours. Appendix 14 shows details for the two subgroups.

5.4.2 Subgroups 1 and 2 – different attitudes and behaviours

Andrew, Dani and John (subgroup 1A, see appendix 14) all described how their school had relatively well organised and extensive planned programmes of professional learning focussed closely on a major aspect of their school improvement plan. They described how

these were related to promoting changes in classroom practices, particularly in pedagogy. Dani had also received coaching for several years. For much of the year of the study George (subgroup 1B) had also benefited from a programme of one-to-one mentoring to support him teach an unfamiliar subject which had led him to undertake other related professional learning, all of which were closely related to improving his subject knowledge and pedagogical content knowledge in mathematics. This professional learning was clearly impacting on professional learning behaviours in a way not observed in the other participants (subgroup 2). The professional learning available to teachers in subgroup 1 through school-based channels, and often provided within the teachers' Working Time Agreement, was more closely aligned to their personal needs and interests resulting in a much greater buy-in to these activities than was the case in subgroup 2. Why there was a difference between the two subgroups will be explored further in the following two sections.

5.4.3 Whole-school professional learning programmes

Prior to, and during, this study, several of the schools in which participants worked had implemented extensive whole-school professional learning programmes often with support from external providers. How impactful these were on the participants varied greatly, and this appeared to depend on factors such as how well teachers had been involved in the decision-making regarding the introduction of these programmes and how involved they were in their delivery. A programme which had been experienced by several of the participants was on embedding formative assessment in teaching based on the work of Dylan Wiliam and delivered by *Tapestry*. This programme had impacted very differently on participants as illustrated by the following two extracts, first the positive experience described by Gill.

> Stuart: "*You've included on your list that you led one of the Tapestry TLCs as well.*
> Gill: "*… I thought that was a tremendous model for moving practitioners forward in their thinking and in their practice because of that collaboration. And that, you know, I don't know how you would put it in proper academic edu-speak, but that feeling of responsibility, that feeling that you've got to deliver, ... because you were having regular meetings and you were, you felt responsible for the group as a leader and you felt responsible for supporting everyone else and going and observing them, and them*

coming and observing you, that fertilisation, I just, that we all kept each other going with, making sure that it didn't just fall down the to do list.

Stuart: "*Yeah. Well, you obviously had a sort of leadership role within that as opposed to maybe participating more. … Did that mean that you got more training or support for actually delivering that than other staff got?*

Gill: "*Yes*.

Stuart: "*And also, you know, do you think that the other staff, were they necessarily as invested as you, you know, in terms of seeing it through?*

Gill: "*Well, I mean that's quite an interesting point, and that's something I've been thinking about as well, is that whole spirit of cascading. You know, as you say, quite a common model. If something new is happening it is, yes send a couple of members of each school to a central training session, or an information event, and then they're supposed to cascade it back, and sometimes that can be remarkably ineffective and the only people that significantly move forward are the people who were at the original event due to the dilution or, sometimes it's just the lack of time, you know, if someone has gone for a whole day training session, can you really distil that into 45 minutes on a Wednesday afternoon in December. So maybe yes, maybe you're right, I maybe did get more out of it but then that's, I took that as that it was my responsibility as the leader to engage and support and invest and provide as much support as I could. So, I suppose really, they were seeing the same resources I had seen and I suppose that, but that's you know, that's what I felt and my responsibility was to make a significant impact on them and support them feel as invested in it as I was. I mean it was quite interesting Stuart because with the Tapestry learning communities again it was conscripted upon everyone, we were all conscripts, we all had to do it, … and I felt in terms of the ethos among the staff and the, the feeling of connectedness it was a really important opportunity for bringing the staff forward and moving them all on*."

However, the experience described by Ava was very different.

Ava: "*A lowlight, for me, would have been that [local authority] a few years ago did, what they made compulsory, those, what were they called Tapestry, was that it? Based on Dylan Wiliam and I don't know whether it's just because I'm ornery and awkward, the fact that they made it compulsory, we were told that was going to be*

our entire CPD budget that year was going to be on these sessions and I thought that was the most horrendous imposition, there was no kind of 'What do you feel you need for your training?' or you know the attitude was kind of like 'Oh well, CfE is done, everybody knows CfE'. I didn't feel like it was done! I didn't feel like I was doing the best job that I could to teach my subject. The workload associated with it, as well. And the budget, they went and bought these books. Every single one of us was given one of these books, and then we were given a big binder, like the cost of that per teacher. Ugh, I'm still cross now thinking about it, and that was imposed on us that year, and yet there was other CPD things that I felt I wanted to do, that I needed to do. … I couldn't say that I came away from those Tapestry sessions, there's not, there's nothing that I'm aware of that I've taken from them back into my daily teaching. Whereas, you know, if I go back to the IOP, the SSERC stuff, ASE, Perimeter Institute, those, those were the, you know, things that I could lift everything, from practical activities, altered styles of questioning and I guess, this is what bugged me about the Dylan Wiliam stuff, was it was supposed to be about styles of questioning, and yet I was coming out of Perimeter Institute, which also had a lot of stuff in there about styles of questioning, but the Perimeter Institute was helping me with questioning that was applicable to my subject and actually helped me in the classroom. The Dylan Wiliam stuff I struggled to see the relevance of it. [laughter] Another teacher colleague of mine who had been through Tapestry previously, she said, och Ava, don't take it so seriously, just don't take it seriously, she said, we did this all before, and she said, the great thing about it was you got to know your colleagues better, and that was all she could say for the value of it and I, you know, if I had lunch with my colleagues, or a glass of wine with my colleagues, I could get to know them better and you're using my entire CPD allocation of time for this. So yeah, I was very disgruntled about that."

It is clear from these two accounts that Gill and Ava felt very differently about their *Tapestry* experiences and being 'conscripted' into it as part of a whole-school programme. As a leader of a Teacher Learning Community (TLC) group Gill had received out-of-school training ahead of the in-school activities and felt responsibility for ensuring that the TLC worked effectively. Receiving this training appears to have led to Gill having greater buy-in to, and perhaps understanding of, the intentions of the programme than was the case for Ava. Ava clearly did not think the *Tapestry* TLC model was meeting her needs, and certainly not as well as

other professional learning she had experienced and opted into on a personal basis, opportunities which Gill had not been able to experience to the same extent.

During their initial interviews Dani and Andrew reported that the *Excelerate* programme was having a significant impact on the professional learning decision-making in their schools, including their own prioritisation for more personal professional learning, however, as Dani describes, initiatives such as this might result in too much change simultaneously to allow staff to embed it fully in their practice. It also illustrates an interesting power dynamic.

> Stuart: "*The whole school things that you've been doing, most recently … you've said there that that's something that you're doing, you know, partly because of being a PT and following what the school direction is going. So again, is that something that's been arranged very much on a whole school basis?*
>
> Dani: "*Yeah*.
>
> Stuart: "*Is there a compulsory element of that as a result?*
>
> Dani: "*The school organises these things and they can't, it's not compulsory, but you know, you get the impression of it if you don't attend then, you know, um, yeah, things are not going to go too well. I don't know how to put it*.
>
> Stuart: "*Yeah, I know, yeah*.
>
> Dani: "*You know what I mean?*
>
> Stuart: "*Yeah, I get the idea*.
>
> Dani: "*Yeah, the headteacher has got, you know, a vision almost, and this is the journey to that vision and there's parts of it where going to these professional learning events has helped in terms of understanding the vision and getting to where the headteacher wants the school to go. It's a bit of a mishmash if you want though. It's almost lots of different, it's too many things going on at the same time. … and there's lots of other events that aren't, that aren't really professional learning but it's all going on at the same time, and being that this is happening now, or has been happening over the past year it has been difficult I guess, you know, with the situation we're in [COVID-19 pandemic] to, to have this much change I guess, or change in direction*."

During his initial interview, Andrew, who was one of the less experienced participants, was generally positive about the developments in his school and the changes they were bringing

about in his interests and practices. Although it was early in the programme, and he was critical of some of the details, he considered it was likely to result in changes in teaching and learning practices in the school in the longer term.

In his follow-up interview, Albert described his experience of the *Excelerate* programme recently introduced into his school. Unlike Dani and Andrew, he had not been actively involved in this at an early stage and saw it as an imposition and poor use of his time.

> Albert: "*We've had a lot of time spent on it, but nothing's really been achieved. There's no, there's been no development from it. There's lots of meetings about meetings about meetings that might lead to CPD at some point in the future or a small minority of people have gone off to Nashville and places like that. … In-service days have basically been taken up with what I described to somebody as sales talks. People trying to sell us the PBL, the Oracy, and the Excelerate programmes, but no real staff development out of any of it*."

He also displayed some cynicism regarding the effectiveness of whole-school professional learning initiatives.

> Albert: "*Okay we've had, we get stuff thrown at us every two or three years, but it doesn't seem to come to anything, where it's suddenly this is the big thing. So, we are just coming off Visible Learning which I think I have done for about the second, if not the third time in my career, which becomes the big thing, but we are not really given the time to do it and it doesn't really relate specifically to my subject. We then had Cooperative Learning before that. So, you get these sorts of, I'm now at that stage in my career where I have been through this cycle like about three or four times now where there's the next big thing and it sort of dies off [laughter]."*

Teacher buy-in to such programmes clearly depends on several factors, but the different reactions of Gill and Ava to *Tapestry* and Dani and Andrew compared to Albert for *Excelerate* show that how programmes are introduced to staff, to what extent they are directly involved in decision-making and leadership of the professional learning, and whether adequate time is provided to embed changes in practice, can impact very differently on outcomes.

It was interesting to note that the initial enthusiasm of Dani and Andrew for the PBL promoted by *Excelerate* had waned during the year of the study. In their diary-logs, in their

end-of-year reassessment, they had frequently downgraded the impact of PBL professional learning. In their schools, PBL was only being used in a limited way in S1-3 and not in the Senior Phase.

> Andrew: "*In practice it created some good groundwork and some nice aspirations, but it's not going to help us in terms of planning out stuff going forward*."

Dani continued to be concerned about how any learning might be embedded in the longer-term and spread more widely across his school beyond those who had been actively involved initially, especially when key staff change.

> Dani: "*What's happened is there's certain people in the school have had different levels of professional learning, and … I've had a lot, especially compared to others. What we then don't get is the opportunity when you're, you know, in a teaching timetable, to collaborate. ... It's another one of those things where you've done professional learning, … but you know, maybe two years down the line it will disappear*."

This raises wider questions about how collegiate time in schools is used, how leadership of professional learning and the exercising of power can impact on the culture of professional learning within schools, and how that impacts on the efficacy of use of the time available. Across all schools and participants the lack of time and space for collaborative working, whether formal or informal, was clearly an issue, undoubtedly related to Scottish teachers having a relatively high teaching commitment (OECD, 2019a, p417) but also to prioritisation. How teachers were able to collaborate in the available time varied considerably and is something that will be explored in chapter 5.4.5. However, the other distinguishing feature between subgroups 1 and 2 is explored first.

5.4.4 Mentoring and coaching

The other distinctive feature between subgroups 1 and 2 was involvement in coaching or mentoring. Dani, a principal teacher (PT), had been coached by someone from an external consultancy firm which works with staff from other sectors as well as education. Dani clearly considered this coaching to be beneficial for the development of his leadership skills as a PT rather than for the development of his teaching.

> Dani: "*With the coaching it's been more being able to work through a process if you want. … The coaching for me just kind of grounds me almost. It stops me from overthinking things, and it's just, I don't know, I've just found it really useful for my day-to-day job … as a principal teacher.*"

As a PT, and partly due to changes made in response to COVID-19 lockdowns, Dani was beginning to use coaching techniques learned as a coachee during fortnightly one-to-one meetings with every member of his faculty. He was finding this a more effective strategy for dealing with certain business compared to large group meetings with lots of competing voices. It resulted in deeper, more positive dialogue and these meetings had become a staff expectation.

George was receiving one-to-one mentoring, what some might describe as instructional coaching (Knight & van Nieuwerburgh, 2012), in a subject he had not taught previously. He valued this highly in supporting his professional growth in this new area thanks to its deep discussions about pedagogical issues with an expert colleague.

Teachers in subgroup 2 had not had coaching opportunities, although many spoke very positively about mentors they had had early in their career. It was commonly the first thing participants spoke about when starting to describe the most significant developments in their professional learning journey.

Several participants spoke positively about university tutors and teachers from whom they had received advice during initial teacher education and probation. This included official mentors but often other teachers with whom they worked, and there was a considerable element of serendipity involved. For the more experienced teachers beginning their career before the reform of promoted teacher structures which followed the McCrone report (SEED, 2001) this usually included an experienced PT physics, but also a range of other colleagues as illustrated by these comments:

> Ava: "*The first year I was in teaching, I had a wonderful department head who gave me great support. … and I would honestly say that since then I have never had that kind of support. Never. I've been thrown in the deep end [laughter]. Ah, yeah, he was terrific, just taught me a lot, I learned a lot from him.*"

Clara: "*I think I was very fortunate to be in a big [department], well as I say, there were four physics teachers there and as I say [physics teacher] was particularly good with the practical side and the Higher knowledge, and we also had dedicated technicians at the time, so there was always, you know, plenty of scope that you felt supported with practicals and you knew the equipment was maintained. I would say it was a very good starting place to be and having a PT of physics and a PT of chemistry as well made you feel you know pretty much everything was in order. … I always liked working under [PT Physics] because she was also, I guess, a bit of a female role model.*"

Subject-specific support was raised by many as being important. Some teachers in schools which had a head of faculty from another discipline rather than a PT physics, had been fortunate to have an experienced physics teacher on hand for guidance and advice.

Andrew: "*[Physics teacher] gave me an awful lot of stuff to do with the SQA marking in terms of making sure I absolutely understood why the marks were being awarded at each stage, and particularly given what's happened the last two years that's been absolutely invaluable … he wasn't actually my probation mentor ... I had a different probation mentor who was great, she was great at getting all the paperwork done, but he was just a colleague there who just happened to be an SQA marker … which was again great last year [when exams were cancelled in 2021 due to COVID-19], because it meant when I submitted my things to the SQA I was at the very least confident that what I was submitting was good, that I had really robust evidence.*"

However, other have been less fortunate as illustrated by the following comment by George who had particularly enjoyed and benefited from excellent support from his lecturers and mentors during his initial teacher education around a decade previously.

George: "*I don't think I've been watched by a physicist. In fact, only once when we had an HMI inspection. That was last year, just by chance, one of the inspectors was a physicist, that's the only time I have been observed by a physicist. That was really useful actually.*"

Teachers in smaller schools, such as George, frequently find themselves in situations where they do not have colleagues teaching their subject. However, even in larger schools the

subject-specific mentoring support available to more recent entrants to the profession was clearly variable and new teachers often turned to teachers of other subjects for more generic advice.

> John: "*There was a teacher who when I first started in [school], in fact a lot of the time, maybe the first ten years of my teaching in [school], I worked across the corridor from a guy called [teacher]. And he was very good at building relationships with the kids, and quite often he could, because we worked across the corridor from each other, he could see where I was doing things wrong if you know what I mean, he could see where I was maybe coming into conflict with some of the pupils or there was maybe a sort of rapid disengagement and a lot of the time I got a lot of good advice from him on just sort of classroom management issues … obviously he had been teaching there forever, so it's, I'm sure he had this sort of feeling of nurturing sort of all of the younger teachers he had got around about him, and he was, he was very good.*"

Beyond probation the opportunities for teachers to be officially supported by a mentor or coach were very limited.

All participants saw benefit to their own professional learning through the mentoring of others, although their experience of this was restricted to student teachers and probationers. Some schools had student teachers on placement on a frequent basis and some participants had taken on the role of mentor, formally or informally, on several occasions. For example, one of the more experienced teacher participants had worked with several early career teachers and commented:

> Albert: "*Oh, I find that really useful. I got a lot out of it because I was finding myself having to go back and rethink my own teaching practice but also relearn why I was doing stuff.*"

One of the less experienced teacher participants had had the opportunity to work with several student teachers.

> Andrew: "*Formal mentoring, I was the mentor for one of our student teachers this year, and I was informal mentor for another one. Like I kind of almost felt, because the way that they did it this year is that they got it so that it was always a non-subject*

specialist who was your, who was the person, for me I was mentoring a chemist. So, then I was mentoring a chemistry teacher, but it meant I didn't see her as much, whereas someone else was mentoring the physics teacher who I saw teaching all the time. I've had, I've been an informal mentor for a few to be honest. I was informal mentoring last year as well, so I was an informal mentor for a biology teacher and a physics teacher."

Others in more remote areas had rarely had the opportunity to mentor early career teachers. Gill, an experienced principal teacher, had only recently had a rare experience of having a student teacher on placement and when asked if it was beneficial to her said:

> Gill: "*Oh yeah, I mean we just had, I just had a student from [university]. He was with us between October and December for his PGDE and that was just a brilliant experience, you know, being a single person department, you know, he's still developing as a physics teacher, he's very much shadowing me for most of the day, and it was just a fantastic opportunity I think for me to reflect on what makes a good physics teacher and for him to learn from my many years of experience. He really did, you know, seem to appreciate it. Again, that idea of it's about more than just the subject knowledge, yes, we did talk about how to deliver it, how to get, how to pitch the level right. How to break the, it was in Properties of Matter for National 5, how to break it down into chunks, and how to support the retention of knowledge, and how to develop the skills, but also being able to fill in the background about the young people, and how to get the best out of them by knowing them as individuals, and how to, you know, reconcile their, sometimes their challenging behaviour with where they are at in their life. So, that was definitely one of my best opportunities, best experiences over the last year.*"

The fact that many of the schools in the Northern Alliance are remote from universities offering initial teacher education results in many teachers having little opportunity to work with student teachers on placement and benefit from the reflection on their own practice and professional learning that this can bring.

Given the significant benefits which can be gained from the various forms of mentoring and coaching, including instructional coaching (Desimone & Pak, 2017; Kraft et al., 2018; Sims et al., 2021), it is clear that, other than the requirements of mentoring early career teachers,

this form of formal professional learning has not gained any significant traction across the system in practice. However, there is ample evidence of colleagues supporting each other in other ways and this being widely appreciated by all participants.

5.4.5 Collaboration with colleagues

In my previous research (Farmer, 2018), the professional learning most valued by the teachers of physics interviewed was regular collaboration and discussion of teaching and learning with their immediate colleagues and this proved to be a strong theme once more. All teachers, except for Dani, thought that both informal and formal opportunities for collaboration with colleagues provided good opportunities for professional growth. On probing Dani further, his views were not so much they were not opportunities in principle but that they were not particularly effective in practice as time-poor teachers were rarely able to implement any learning which might occur. The form and settings for this collaborative working varied with much of it informal in nature in addition to planned formal activities.

Informal collaboration with colleagues

A good example of how useful teachers considered informal working with colleagues to their professional growth was Neal's response to the question "*What were the most shaping events in that journey that you have had?*".

> Neal: "*Personally I think it was the staff that I worked with. You know, you had some very, very enthusiastic staff who, you know, it was just so infectious that it just rubbed off and they, they encouraged you to try things, and supported you and you could go and run your ideas by them. And I suppose once you kind of get swept into all of that you gain more confidence and, you know, being allowed to try things but having the time to do it as well.*"

This fits well with Kraft and Papay's (2014) work showing that teachers working in supportive professional environments develop at a greater rate and for longer. However, others also made comments about the importance of being able to have time to interact with colleagues.

> Gill: "*The informal opportunities I got from [physics teacher] to really learn about the craft and learn about the different ways of delivering subjects was really insightful, but as I say, that was completely unplanned by the school.*"

> Andrew: "*[Informal discussions with colleagues] happen really commonly quite a lot of the time it's just, it might be just they suggest a better question, or ask a question about something, or how could you explain this, how have you handled an incident with a certain pupil, like there are lots of little questions here. And while I certainly wouldn't put anything … in the GTCS form on professional learning, it's at least worth acknowledging that these are useful conversations.*"

> Luke: "*It's a bit of a long-held belief of mine that [informal discussion with departmental and other school colleagues] are the most underappreciated forms of professional development. … I just think we've got to be really conscious not to assume that if you see two classroom teachers sitting in a classroom drinking coffee that they are not doing anything useful*."

Perhaps inevitably teachers who were the sole physics teacher in their school collaborated with others in their community, perhaps to a greater extent than those working in larger schools with several physics and science colleagues readily accessible to them.

> David: "*Particularly the [informal discussion with colleagues] will particularly be my maths colleagues, and you know informally meeting maths colleagues and talking about you know, how and when we go about teaching similar things, and how we can work together a bit better, and how we fit it in and timing. But you know, when there's only one colleague in maths and myself in physics that becomes a lot easier to do, but generally it happens at the photocopier or in the staff room. [Informal discussion with wider school colleagues], particularly the end of the day is interestingly sometimes it's the cleaners and the janitors. You know, the PSAs [pupil support assistants] and those discussions are really good just to get a feel for what's kind of going on in the school and how, you know, some of the kids might be coping or not or particular things that they might come across, it's very valuable.*"

There was also evidence of teachers working in smaller schools without other physics colleagues forming informal links with teachers in other schools. For example, one teacher

had met a teacher from a school in a similar setting in a different local authority at a conference and they had continued to communicate and support each other remotely.

Despite him participating in frequent informal discussions, Dani suggested that these might not often lead to any impactful change.

> Dani: "*I think, you know, when we do have these, we're having these informal discussions all the time, it's such, it's a thing that happens whenever you're speaking to a colleague. What happens, what tends to happen is I'll say something along the lines of, oh yeah, yeah this is a great idea, and then by the time I get to my classroom I'm on to something else and I've forgotten about it almost. It's not actioned.*"

Whether the more formal opportunities provided by all schools for the collaborative working of colleagues are more effective at promoting professional growth in teachers and changes in practices will therefore be explored next.

Formal collaboration with colleagues

Formal collaboration with colleagues in a school can come in many different forms. The boundary between what is formal or informal is also open to interpretation. To exemplify to participants what I consider to be formal activities within a school, I used the examples of departmental meetings, joint resource development, peer observation, lesson study, lunchtime and twilight working groups, and teacher learning communities.

Different approaches to supporting teacher collaboration are taken in different schools, as is the place of professional learning within broader collaborative activities. All but the smallest schools, which do not operate on a departmental or faculty basis due to their size, have a schedule of regular departmental meetings. Whilst these offer an opportunity for professional learning they are generally used for more administrative tasks.

> Dani: "*Departmental meetings tend to be more day-to-day, what's going on. Having professional learning as part of that as a standing item on the agenda, but we, most of the time we don't get there, or it gets forgotten about because there's other things going on*."

David: "*It's hard enough to get through the agenda as it is without doing anything additional*."

The use of observation tended to be associated with the PRD process and therefore conducted by line-managers with an inevitable 'appraisal' aspect to the process. There were examples of this being good professional learning for the observer but perhaps less so for the teacher being observed.

Neal: "*We have to observe, or I have to observe my staff every year as part of PRD. So, I think you know that I have certainly taken stuff away from that, and you know regardless of whether it is that I am observing a Higher class, or a first year or second year or whatever there is always things that I think 'Oh, I never really knew about that' and I have then been able to use that at perhaps at some point. Not always, but at some point. It has given me a greater understanding of something perhaps that I didn't have before, so I would still class that as professional learning*."

Peer observation and learning trios had been promoted as a formal process in some schools but there was little evidence that this had operated successfully.

Ava: "*[Head of faculty] periodically tries to get peer observation going. It never goes very well, and I've never found it particularly helpful either being observed or observing to be quite honest with you*."

The formalisation of the process was seen by some as having a detrimental effect on the process as a form of professional learning.

Dani: "*Peer observations have become almost a ticking the box exercise for us rather than valued, you know, a valued feedback process. … it's become an expectation that you, you do these things, rather than, rather than actually doing them for the benefit that they would give*."

For others, a more informal or organic process was preferred. Observing teachers working in as similar a context as possible to one's own was seen to be of most value.

John: "*If I go in to view any classes it's mostly [other physics teacher in school]. You know, obviously because there's, there's the similarity. We have very different styles,*

very different teaching styles, but obviously we are trying to achieve the same goals. I don't really go in to view any of the biology classes or anything like that. It's too far removed from what I am trying to do."

Albert: "*It's something I've sort of thought about a lot recently is that it's this idea of organic versus inorganic. Where stuff like that happens organically, I find it's really useful but when it becomes this sort of inorganic management led thing it actually does more harm than good nearly [laughter]. … What I mean by organic is if I've got a colleague that's doing something I'm like 'can I nip into your class for 5 or 10 minutes to see how you're doing that' or a lot of us have sort of like an open door policy where you are free to nip in or out of each other's rooms, or actually I think that most physics departments, like they've got equipment stored all over the place so you're sort of having to go through other people's classrooms just to pick up equipment, and you'll sort of find them doing something and you'll just stop for a couple of minutes just to see how they do it, I think that's really useful. It's when you have to stand in the back of their classroom with clipboard and like a load of boxes to tick and then have to write a two-page essay then I think it loses any usefulness*."

There is nevertheless a danger if relying on an informal process of observation that it gets squeezed out due to competing demands on teachers' time. However, there is also a danger of an overly formalised process set up with the aim to ensure the benefits of peer observation are enjoyed by all teachers destroying these benefits for all. The management of such professional learning treads a difficult line in maintaining a suitable balance. The same applies to other in-school opportunities for professional learning.

Many schools had a variety of lunchtime and twilight meetings and working groups for staff, and just as for departmental meetings, administrative tasks rather than professional learning tended to dominate agendas. The effectiveness and impact of these were seen as being highly variable and the time to participate limited and under pressure from competing demands.

Luke: "*Formal discussions with other school colleagues, that really depends, I think, on what you're discussing. So, if you have something in particular to discuss, you know, I'm not against having a meeting, but I want a meeting to have a purpose and I want the meeting to last as long as necessary for that purpose, not because, you*

know, the clock says a particular time, and so I find it very hard to give feedback on that one. There are times where you'll sit down and think, right this is actually really useful. You know so, for example, science meetings … are scheduled … and we have spent some time going through Rosenshine's principles, so that was quite interesting. … We've got various school improvement groups, but you know, they are dictated by above. You know, they may be beneficial for the school, but I don't think they're necessarily beneficial for the people in the groups. … A lot of me, you know, when I say that there's this belief that you have to have your time filled and that's one of the places where it tends to come in most frequently. I'm not going to complain too much because our current head is actually quite good at this but you're constantly getting stuff coming out from the Council and you can tell they've had to, they've felt the need to put something out with things to do and you do wonder what the value of it is when you're looking at classes that you've got coming and things you could be doing with your classes to improve what they're doing."

A few participants were able to identify a small number of useful professional learning activities provided through in-school events.

> Neal: "*One of the things that we did as a whole staff was a thing on sort of, erm, stress and mindfulness. So, we had one of our educational psychologists come up and deliver quite a good session about basically looking after yourself, and you know what to do if you were feeling as if you were getting to the point where you were wanting to burst. So, I think that was quite useful*."

Two participants who had developed good ICT skills described how, particularly due to the COVID-19 pandemic, they had been involved in organising and delivering professional learning sessions on this to other staff. There was an element of serendipity involved in this thanks to previous learning these teachers had undertaken as described by the following extract.

> Stuart: "*Are there many things that are organised, you know, as twilight meetings?*
> John: "*We've got a few, between maybe five or six in the course of a year, there might actually be more than that. But there is time set aside in the working time agreement to do these sorts of things after school for an hour, and although there are, there are workshops for interdisciplinary learning ideas and DYW [Developing the Young*

Workforce], there's also the training of teachers in G-Suite is involved in that as well and because I'm, and because I'm kind of one of the more advanced teachers in the sort of thing, quite a lot of the time I am running those sessions.

Stuart: "*Has there been any support for you to develop these sorts of skills or is it just something that has happened?*

John: "*It's just something that I did with my own 35 hours a couple of years ago. So, I worked my way through, what's it called, it's the Google Training Centre online learning platform. So, I just worked my way through that and when you, when you total up all the hours that they recommend that you spend on it, it comes to about thirty-five. I'm actually quite a slow reader so it actually took me a bit longer. It was, it was all off my own bat really. It was not, it wasn't something that the school gave me time to do*."

In addition to collegiate time, the five contractual in-service days, when staff are at work, but pupils are not, are a very significant resource which could be used for collaborative activities and teachers had strong views about the use of this time.

5.4.6 Use of in-service days

One of the in-service days is typically on the first day of the new academic year in August, which was widely seen as being administrative in nature and including little professional learning. The remaining four days are spread across the year. The practice in different local authorities varies but the in-service days are typically split across different formats including whole-school in-school activities, local authority-wide subject-based activities, and cluster activities involving a secondary school and its associated primary schools. In recent years a few additional in-service days have been provided at times of specific need, for example, to support the introduction of new SQA courses or the moderation of assessments during the COVID-19 pandemic.

Teachers in subgroup 2 did not consider the activities available to them during in-service days and other collegiate time as being well planned, having a clear and worthwhile strategic direction for their school, having a focus on pedagogy, or addressing their professional learning needs. Typical comments from teachers in subgroup 2 were:

David: "*Mainly the in-service days have been fairly much a let-down*."

Calum: "*To be honest, a lot of these in-service days get taken over for school management issues and there's not generally a whole lot of pedagogy or reflecting on classroom practice in them.*"

Luke: "*I take meeting notes in OneNote, and I left the in-service day … with like two bullet points, out of a whole in-service day, you know, something that was relevant to me.*"

Neal: "*I can't really say that the in-service days were used for a huge amount to be honest, and I can't actually really remember what they were used for to be fair*."

Albert: "*We've had nothing I would consider professional development on any of the in-service days*."

Despite the different behaviours exhibited by teachers in subgroup 1, they also reported that in-service days could be better organised and more impactful.

Dani: "*The in-service day programmes are very top down. There's, it's more, here's a load of information on, or this is what we're doing. It's, there's not, and I don't think I would even call it professional learning, I would call it meetings, that is what we have during in-service days*."

George: "*It's frustrating when we have a CPD school course at school and there isn't an evaluation about it. We had a really interesting, potentially really interesting project where we looked at the Educational, I always forget what it's called, Endowment Foundation, the evidence-based thing, and it was just, it was like rushed. I don't think we were given time to try and implement some ideas properly. You know, I think it's the attention to detail and it's just having that really is so important to have that attitude behind it where you're trying to do the best of this and you, and you're also humble enough to think I'm not getting all this right, let's evaluate the course carefully, let's listen to what our participants are saying and make improvements. And I don't think that happens much in the school-based CPD, the council-based CPD. … It seems very haphazard*."

Andrew: "*In-service days … were just very, by the numbers, they weren't really beneficial to my professional learning. In terms of other school time, collegiate time,*

it has been pretty good, mostly because the kind of collegiate stuff I've gotten involved with is what I wanted to develop in."

The quality of organisation, facilitation and expert input was seen to be a significant factor in the usefulness of the activities during collegiate time and in-service days. Teachers recognised that often those leading sessions, especially busy colleagues, had not had adequate preparation time or support to maximise their impact. The one-size-fits-all nature and lack of opportunities to opt into many whole-school activities came in for frequent criticism, especially for ICT training.

Luke: "*The parents evening software [sigh], in a way, you know, they were trying to do something really good there, because again it's the typical cry of teachers when they don't know what they're doing, oh we need CPD. Actually, no, I think a lot of these times you maybe need a little bit supported time with the software to see what you're doing, but instead we had a headteacher wrapped up, and she must have been at it half the day, trying to create a fake parents' evening and have somebody from the office call in and pretend to be a parent, you know, and I'm thinking [sigh]. … it's the simplest software in the world, you just need to be there. It's stuff like that, I appreciate … we've got some teachers are really not good with technology, but that should have been entirely optional*."

The general response of all participants was to value any subject-specific in-service days more highly than the more generic whole-school ones.

Dani: "*The ones where there's an external provider who's delivering something generic have never grabbed me. The ones where there's been a focus on, you know, either the subject, actually it is the subject, so for example, you know the science, the [local authority physics teachers' network] would have invited you, or Gregor from SSERC, or we do some Understanding Standards stuff, or whatever it is, that has been very useful*.

Stuart: "*Okay, but it's the more generic ones that generally you haven't found so useful*.

Dani: "*No. They tend to just be somebody talking at you for hours on end [laughter], it's just not useful*."

Albert: "*The in-service days have changed dramatically. In, the last two, three years [subject] in-service days have been focused nearly entirely along like a rehash of the SQA Understanding Standards events. Probably even more like four or five years. It's been like a rehash of the SQA Understanding Standards. … [In-school] in-service days at the moment are just fairly much a lot of administrative tasks rather than what I would say was any sort of professional development. It's, it's sort of like sit in this room, go through a PowerPoint, so we can tick the box to say that you've been trained in this*."

It was clear from the conversations with participants that the much of the more generic in-service time was being spent on administrative tasks rather than professional learning, or deficit models of transmissive one-size-fits-all training. Even within the subject-specific activities, the standardisation and administration of assessments was dominating rather than professional learning focussed on the improvement of pedagogy. A particularly damning indictment on the poor use of valuable in-service day time was made by Ava.

Ava: "*There is this one in service day, a few years ago and I was ill, and I phoned into the school to say that I was ill, and I happened to get one of the depute rectors on the phone and she says "oh don't worry about it Ava, it's just in-house CPD today you're not missing anything". [laughter] What! You know, well that just summarises it completely*."

The depute rector may have been, at least in part, trying to make Ava feel better about missing the day, but the wider discussion indicated there were deeper issues regarding the effective use of time. Despite the many negative comments made by teachers about the use of in-service days two of the teachers did make more positive comments. Gill described one example of when in-service days were linked to a series of follow-up events and were used in a way to promote collaboration and a sharing of practice between teachers across the primary and secondary sectors.

Stuart: "*What are the main benefits of in-service days, whether they are in school ones or local authority-wide ones? Are there particularly, you know, good or bad examples that you might want to give?*

Gill: "*I think, you know, again it's just, it's that opportunity for collaboration with people from other areas, you know, we had some, two years running we had sort of*

ASG [associated school group – a secondary school and its associated primary schools] meetings, and you know that, and then we were going to follow that up, we followed that up last session with meetings, like I think eight meetings across the session where you were meeting with people from across the sectors, across the ASG, and that was quite good for just that whole idea of seeing how other people do it, and learning from the other sector. You know, when you speak to a Primary 1 teacher about self and peer assessment, how they do it, it is quite fascinating."

John also described how the arrival of a new principal teacher in his school, and the new perspectives and enthusiastic, knowledgeable leadership this had provided, had helped rejuvenate whole-school activities from which he had benefited.

> John: "*In the past, I can remember whole-school events that have been incredibly, sort of, tedious. But this year actually has worked quite well because it is something that I think is worthwhile, is worthwhile to my classroom activities. … I think when you get a sort of injection of new blood into the school obviously there are fresh ideas that come along with them, and maybe a little bit more enthusiasm to take the school off at a slightly different tangent from the sort of momentum that it's had in previous years and that's been something that's been good this year*."

Gill and John describe examples which illustrate the benefit of follow-up activities to any initial professional learning input. However, such opportunities, or the use of in-school expertise as described by John, appear to be rare. Both Dani and Luke made informative comments about those leading professional learning in their schools.

> Dani: "*I can't really blame the people who have put together … this professional learning. They wouldn't have had much time to do it, … and instead of having powerful discussions, we were doing all these type of filler activities that we've all done at every single in-service day, or every single after school meeting over the years, and I was really disappointed*."

> Luke: "*I like our SLT, but I think there's often pressure on SLT in schools to be seen to be doing something, and I think that sometimes manifests itself in taking some relatively small tasks and make them into much bigger deals.*"

The discussion around in-service days, as well as comments made more generally by the participants, highlighted improved support was needed for those leading professional learning in schools and that professional learning closely connected to classroom practice, or within their subject context, was more highly valued and considered to have a greater impact on improving their practices than much of the more generic professional learning on offer. The next section therefore looks at the participants' experiences of subject-specific professional learning in more detail.

5.4.7 Subject-specific professional learning

As discussed in chapter 3.5.3, subject-specific professional learning can provide firm foundations for effective and efficient teacher professional growth and improvements in classroom practices. Participants reported that subject-specific professional learning is available to them in a variety of forms with conferences and twilight workshops, local authority physics teacher networks, and more private activities such as studying MOOCs, listening to podcasts, and reading books and blogs all mentioned. All participants rated very highly the professional learning activities provided by the Institute of Physics (IOP), the professional body and learned society for physics in the UK and Ireland (Institute of Physics, n.d.), and SSERC, the national support agency for the STEM subjects (SSERC, n.d.). That this professional learning was generally rated so highly compared to other professional learning mentioned by participants perhaps reflects that participants saw it as the professional learning which led most effectively to their professional growth, changes being relatively easily transferred into their own working context. Many identified IOP and SSERC as their main, or even only, source of subject-specific professional learning.

> Stuart: "*You have highlighted a few of these SSERC and IOP things that are obviously quite subject-specific, could you explain why you found them, you know, worthy of putting on your [roadmap]?*
> Neal: "*Personally you get so many different ideas from these events. I am always, it's, I've never, never ever come away from any of these events and thought that was a waste of my time. And I think it is so relevant, and I think that, that when they are run, they are run very, very well and there is obviously a lot of thought gone into it. And again it's the enthusiasm of the people that, you know, that deliver it, the ideas that they have and in many ways, you know, I suppose for a physics teacher that is*

looking for something different to do it is almost as near to utopia as you will get to do all of these things and you then get to share it with other people, you know, and I think I have taken a lot of stuff away from it. A lot of stuff I have not implemented because it's like all of these things you forget about it. I think it is just, there is just a freshness and relevance to stuff and it's always continually evolving, and I just find that the support that you get from the IOP and SSERC is really second to none. … to be fair, there is nothing that I have ever had from SSERC or IOP where I have thought 'that's not good enough for me to use', and I think it's the only subject-specific training that is available to us. You know, we have, we have nothing, we have our subject development groups and there are times we will sit down and perhaps we will look at experiments, but it is very, very few and far between."

Stuart: "*So, anything beyond the likes of SSERC or IOP?*
Dani: "*No, it's, it's mostly been IOP or SSERC things. Actually, I think it has all been IOP and SSERC things*."

However, from other parts of the interview with Dani it was clear that when he made that statement, he was considering professional learning in a limited manner as only externally provided events, as he also said.

Dani: "*The [local authority physics teachers' network] is great when there's somebody who is organising it who's enthusiastic about the subject. A lot of the times with my experience with the [local authority physics teachers' network] it's somebody who's doing it as a stepping-stone for a promotion. We've got [teacher] … his heart is more into growing the physics teachers in [the local authority] rather than doing it as a stepping-stone. It makes such a difference*.
Stuart: "*You've touched on the [local authority physics teachers' network] there a little bit and we've obviously talked a bit about the IOP twilights as well. What sorts of comments, any further comments about subject-based network meetings?*
Dani: "*Yeah, it does come back to that discussion that you can have with folk. They're on the same wavelength as you, you know, you're speaking about things that you're doing day to day, you're speaking about the subject, you're speaking about things that they're doing that you could use in your practice. So, I'll keep coming back to that, I guess*.

In addition to the professional learning events organised by IOP, both face-to-face and online, the online support such as the SPUTNIK email forum for Scottish physics teachers and the TalkPhysics website for sharing resources and ideas (and its predecessors SPTR and Guzled) were also valued highly by many of the participants.

> George: "*Since I've been teaching in Scotland SPUTNIK has been probably my go to thing especially early on in my career, 'How do I do this?' or 'Any ideas for this?', and then just reading other peoples' ideas, I found very valuable*."

> Ava: "*I was at one of the SQA events, you know they ran all those events at the beginning to try and let us know what on Earth was going on and at one of those, you know, I was sitting feeling quite overwhelmed and somebody there told me, it might have even been [teacher] from [neighbouring school] I think, told me about SPUTNIK and SPTR and it was an absolute revelation, it really was good, just to have, well, to discover that there were so many physics teachers out there to learn from*."

The online support offered by both IOP and SSERC, including the workshops made available during and since the COVID-19 pandemic, provide valuable subject-specific professional learning which is accessible to all teachers including those in remote areas where face-to-face meetings with other physics teachers are logistically very difficult.

Some of the participants also rated their local authority physics teacher network as a very effective source of professional learning, however, this varied greatly between different local authorities. Some local authorities had physics teacher networks which worked well but this appeared to rest on good leadership by someone prepared to put in the time and effort required, as described by Dani above, rather than by any support or facilitation provided by local authority central staff. In other local authorities the networks worked less well, and in some were non-existent.

The significant benefit of a well organised, funded and facilitated local authority physics teachers' network was described by Gill.

> Gill: "*I felt supported as a new PT. … the subject group, or the PTs group as they were called in those days, were absolutely tremendous. It was these experienced people like [four now retired PTs]. All these really, really experienced, knowledgeable physics teachers who were just so incredibly supportive. … Four times a year, plus your in-*

services, and later on there was your Institute of Physics, to really get supported by someone who did exactly the same job as you. Yes, you can get support in a generic sense from the PTs in your own school, but that subject-specific support was vital I think to me developing as a physics teacher and as a head of department. And you know, you think, well that was, that was just, you know, luck, coincidence, but it wasn't. The fact that those meetings were planned, facilitated, that formed those, that provided those opportunities to form those relationships. And that's, you know, I know we've had this conversation before, that's what's been lost by the reduction of opportunities for subject groups to meet in [local authority]. I think it must be so much more difficult, there's you know, a new PT started at [school]. I feel it's so much more difficult for her now to get the support that I got twenty years ago. … the support that I received when I started at [local authority] probably only happened because we were all given that time on in-service days and the subject group meetings to meet. So yes I can see it has impact in terms of cover, and yes I can see that some subject groups may not have been as effective as the physics one, but I think they have been a significant loss, and I think this whole issue of what has been happening this year with the SQA in terms of the certification model, the need for moderation, you can't just leave that to people to organise in their own time."

Luke held similarly positive views about the operation of a local authority physics teachers' network, including its continued operation virtually during the COVID-19 pandemic which allowed more than one person from each school to attend.

Luke: "*The [local authority physics teachers' network] I think, looking at it in the short term it's working really well. I think that's largely because we have a good mix of people in the area, you know, and it's if you chuck us all on to a Zoom call we'll quickly find that maybe somebody like [prominent PT] will start asking questions and leading a bit of the discussion and you do wonder depending on who is in the meeting, if that would always be the case. Now fair enough, you know, we are okay just now, but I wouldn't like to guarantee that would always be the case. We're quite lucky that it does tend to be people like [prominent PT], it does tend to be the PTs of course that attend. The good thing about being virtual of course is that potentially everybody could attend. So, I don't see that as a bad thing. I think it's working just now. Ideally, and I'm kind of getting into the situation with Scottish education now, but I think*

> *every school should have a physics PT. And you know the PT should definitely be going and ideally, I don't see why your whole department can't attend, we're not huge departments*."

Several other participants also raised the issue of only one person from each school being expected to attend face-to-face network meetings, or other conferences and events, and the lack of time to then disseminate, or cascade, information learned to colleagues unable to attend.

> Albert: "*I would say that the stuff with the [local authority physics teachers' network] is again they're sort of, erm, I think it is quite interesting at the moment because sort of in terms of trying to sort out the mess with the exams, the [local authority physics teachers' networks] have come into their own. Yet, in recent years, I've literally had to fight to be allowed to go to them. It has sort of become a battle to be able to get out of school to be able to attend the [local authority physics teachers' network]. It's also this idea that you go to the [local authority physics teachers' network], you pick up resources, learning, and then you distribute it to the rest of the people in the department, rather than actually giving the rest of the department opportunity to do their, their own development. There does seem to be this model of you go off and do a one-day course or a twilight session and then come back and you've got 20 minutes to share it with your colleagues, which to me just doesn't work*."

Hence, even if the local authority physics teachers' network as a group in and of itself is functioning well, the professional learning gained by those attending is unlikely to be then disseminated effectively amongst the wider physics teaching workforce unable to attend the meetings themselves. The other meetings which had been held fairly frequently in recent years, due to the introduction of the new National Qualifications as part of Curriculum for Excellence were SQA Understanding Standards events, again on a one representative per school basis. These were focused on professional learning on the assessment of courses rather than on pedagogical issues but nevertheless provided opportunities for wider professional learning by participants due to them affording participants for informal discussions around the formal parts of the events as described by John.

> John: "*The stuff you get away to that is very subject-specific is always hugely valuable because you get to speak to people who are, who share the same interests as you. …*

whenever you go to things like the SQA Understanding Standards days, I mean, yes, it's good to hear from the SQA about their expectations and where they draw the line in interpreting answers and that sort of thing but it also good to hear the opinions and the experiences of the teachers from other parts of the country that are sitting next to you. Because there is this, there's this sort of assumption that what you're, what you're looking at in front of you, and what you're experiencing is your school is mirrored all over the country and you quickly find that it's not, that people have got hugely different experiences, depending on where they, where they are sort of practicing their craft. So, the SQA Understanding Standards events are great when it comes to the actual meat and bones of getting the kids some success [in SQA assessments]. And the SSERC and IOP activities are great, so I've been to a summer school, a few of the Stirling conferences, and the Blended Learning I did recently. That was great."

Participants, particularly those in small schools where there is little opportunity to meet with other subject-specialists during normal day-to-day work, value the opportunities to network with other subject-specialist colleagues out of school, and not necessarily in meetings with tightly set agendas.

> Dani: "*I would have loved to just discuss physics teaching and what we're all doing, and what we're doing differently, and what we're finding useful, and what we're learning about*."

At external events, as well as the informal networking that was clearly valued by many participants, there was the opportunity for input and challenge from knowledgeable others, again in a way not possible during normal day-to-day working. For the physics teachers interviewed, it appeared that many of the participants considered there to be good sources of subject-specific professional learning available, however, for a variety of reasons many had difficulty accessing this to the extent to which they would wish.

> Luke: "*I think that, to my mind that the big thing out of everything else that's missing, because between the IOP and SSERC, and local physics teachers there is actually plenty of experience and knowledge to go at, the thing that is lacking to my mind is, is kind of time*."

It was difficult from the initial interviews with participants to determine how much time they typically spent on subject-specific professional learning, and whether this consisted of more than 50% of their total professional learning as recommended by Wellcome (Leonardi, 2020) but the diary-logs indicated that on average the teachers spent 46% of their time on subject-specific professional learning, see appendix 15. However, this masks a huge variation from George at 88% with much private physics professional learning on top of his mathematics mentoring to John at 8% with most of his professional learning related to his school's in-house programme, although some of this may have included how the topics covered applied within physics. What was apparent was that most of the participants considered that much of the time set aside for professional learning as part of their contracts, such as in-service days, was not used for the subject-specific learning they valued but used for either administrative activities or generic professional learning they considered of little value. It was clear that teachers often lacked the autonomy and agency to decide on their own professional learning and that centrally or institutionally made decisions often frustrated their ability to organise or participate in subject-specific professional learning. It is therefore appropriate to consider next what policy advice and documents the teachers were using to help shape and guide their professional learning, how decisions are made, and what tensions may arise.

5.4.8 Professional learning decision-making

Teachers do not work in a policy vacuum, and it is a contractual requirement and entitlement that teachers undertake PRD annually and PU every five years to maintain registration as a teacher. This provides a clear mechanism for teachers to discuss their professional learning with their line-manager. In the initial interviews I asked which policy documents teachers used to help guide their professional learning and after gathering data from leaders in the intervening period, I returned to this topic in a more direct manner in the follow-up interviews.

Use of policy documents

In the initial interviews I asked participants to describe any policy documents they used to shape or support their professional learning. Six of the eleven participants said they were not aware of, or used, any policy documents in this way, with several then qualifying their answers such as Neal saying "*I am ashamed to say*" and Dani, having reflected on his answer

to the question, queried it by saying "*Is that quite a bad thing now that I am thinking of it?*". Andrew referred to a trifold A4 professional learning policy leaflet he had found in his school but admitted he had not previously known of its existence before going to look for any relevant documents during his preparations for his interview. It had been produced by one of the school's depute headteachers and consisted of an edited down version of advice which pre-dated the National Model of Professional Learning (Education Scotland, 2019a). The other four teachers referred to using the GTCS professional standards, but only as a tool when recording entries for their PRD and PU records, which presumably all the teachers did when completing these records. Of them, Gill, an aspiring depute headteacher also referred to using the school self-evaluation and inspection framework How Good is Our School? (Education Scotland, 2015) and school inspection reports to identify areas for her professional learning. This indicated the influence of an accountability agenda in a way absent from any of the other teacher participant responses, none of whom were openly considering promotion to a senior leadership position, indeed several made it clear they did not intend to seek management roles in the foreseeable future. None of the participants mentioned the use of school or departmental improvement plans in relation to PRD or PU which raises the spectre of there then being a significant likelihood of a misalignment between individual and institutional development needs, or an indication that teachers do not necessarily see these as policy documents. Only Andrew and Dani referred to whole-school initiatives as influencing the professional learning they wished to undertake, but they were both actively involved with the *Excelerate* programme.

I identified six main policy documents that are intended to have an important role in shaping the professional learning of the teaching profession following the documentary analysis and leader interviews. These were the GTCS professional standards, the National Model of Professional Learning, the National Improvement Framework, How Good Is Our School?, the local authority guidance on PRD/PU/professional learning which is approved by the GTCS, and the school improvement plan. In the follow-up interviews, rather than asking an open question as in the initial interviews, I asked teachers directly about the use of these documents during the previous year as well as giving an opportunity for a more open response.

Of these documents, teachers reported only using the school improvement plan to guide their professional learning, with six of the eleven teachers stating they had used it for this

purpose during the previous year. This suggests teachers may not have considered it to be a policy document previously or had just answered in terms of policy documents emanating from outwith schools. All teachers reported they had referred to the school improvement plan in some capacity during the previous year, often during school or faculty meetings. Nine of the teachers reported referring to the GTCS professional standards during the previous year, but not to guide their professional learning, only for recording or other purposes such as supporting probationer teachers. Seven of the teachers referred to at least one other source to guide their professional learning which included SQA course documents, social media, professional communication such as the SPUTNIK email forum, and the needs of the classes they teach. These latter sources, being somewhat ad hoc, show teachers having agency and being flexible and responding to needs as they are identified rather than being locked into annual cycles of decision-making and support. Perhaps, most significantly, none of the teacher participants were aware of the National Model of Professional Learning during either of their interviews.

Three of the teacher participants who had come into teaching after other careers all made very similar comments about the style of educational policy documents in Scotland, including the GTCS professional standards, in comparison to similar documents they had encountered elsewhere.

> David: "*You know, there's a particular style to policy documents. They're all, they're all kind of non-committal woolly language that could be interpreted in many different ways. And so, at the end of the day, it's between you and who's signing it off to interpret what is meant by what standard and what is evidence for what standard. Good documents, where I've seen these types of things before, there are exemplars, you know, for every standard you would see here is an example that is excellent in this standard, you know, a narrative paragraph or description. It is kind of missing from the GTCS stuff*."

> Luke: "*I mean coming from [previous career] before teaching, teachers have an awful tendency to reduce everything to a tick-box exercise, and I've very much found PRD is often reduced to a tick-box exercise. ... The GTCS standards, they're massively open for interpretation but I don't think that's a bad thing. ... It is open for interpretation what they mean, but that I think is appropriate, you know, it is something that should*

prompt discussion. So, from a PRD point of view, are they necessarily helpful? I don't think they necessarily help me day-to-day but I don't have a problem with that. … In terms of development, I'm not so sure how, I would have to shoehorn my development needs into the professional standards I think. So, I don't think they necessarily describe what I need to work on, so I would be largely using them as a tick-box exercise when I look at my PRD, yeah, I guess. And in fact, I did actually, I'm just through Professional Update this year, and that's exactly what I did if I'm honest."

Albert: "*I feel that culturally coming from outwith teaching there is some weird un-understandable desire to produce massive documents that say very little. And it's so unhelpful. I just can't get my head around it. It's just bewildering the sheer scale of it and, and I'm sure half the time the information we want is out there, but it's buried in some massive document that's covered with ten times more words than needs to be there*."

That the teacher participants in this study all came from strong physics, mathematics, or engineering backgrounds might mean they are less comfortable with more subjective language than teachers from other disciplines but as their comparison of educational documents were with those from other industries this lends some weight to their observations. It is also consistent with the observations made in the OECD reviews of Curriculum for Excellence (OECD, 2015, 2021) which recommend that documentation be clarified and simplified.

It was clear that none of the teachers interviewed, other than perhaps aspiring depute Gill, saw the GTCS professional standards or other policy documentation as useful for planning or shaping their professional learning and there were hints that if organisations used the GTCS professional standards as the starting point for designing professional learning activities that this might not result in professional learning seen as meeting their needs. Teachers wishing to improve their pedagogical practices in their own curriculum area was the main driver for them identifying their professional learning needs, as described by Dani.

Dani: "*I think with the way CPD is organised almost at a local authority level, and to an extent at national level with, with the GTCS standards I feel personally that it becomes more of a chore rather than something that you undertake for personal growth and development. When I choose to attend the IOP stuff or want to learn*

more about the pedagogy or get enthused by something big happening in physics you kind of enjoy it. It's when, it's okay there's this CPD, okay I have to attend this so I can get my 35 hours for the year, it just gets, neh, I just can't be bothered with it."

This, and similar comments made by others, is consistent with the findings reported by the OECD which indicated teachers wished greater transparency on responsibilities in professional learning and more support for curriculum-making. It also reported teachers depend most often on their own knowledge and research for identifying professional learning opportunities rather than that offered through Education Scotland, RICs, or local authorities (OECD, 2021, p86). The PRD procedures have been put in place to allow teachers to raise and discuss their professional learning needs with their line-manager. The next section explores how well the teachers considered this process to be working.

Professional Review and Development and Professional Update

As the Professional Review and Development (PRD) (GTCS, 2019) and Professional Update (PU) (GTCS, n.d.-e) processes are a contractual requirement to remain a registered teacher in Scotland, I had expected these processes and associated documents, such as the GTCS professional standards, to feature more strongly in the minds and comments of the participants. I therefore used supplementary questions during the initial interviews to probe further into the participants' experiences of the PRD and PU processes. The views of participants were generally negative as illustrated by these comments by Gill and George, both of whom showed very positive attitudes to professional learning more generally.

Gill: "*I think something that has annoyed me over the years is, I think it is kind of dependant on the PRD processes, it's a bit dependant on your link, on your mentor, or whoever is your reviewer, because, you know, there has been several years when I have not had a PRD meeting. You know, and so, from that point of view if your boss can't be bothered or can't make the time to give you a PRD meeting and discuss it all with you it does speak volumes of how valued you are as a colleague and as a professional. And you know I sometimes, sometimes I vacillate between, well he's jolly well going to have to do it, you know, but when you have had an appointment cancelled on you six times you can see there is no great enthusiasm. And so sometimes I feel that, you know, yes, I'm just going to go ahead and do it myself. I'll go and organise my own training sessions, but other times I can see some people go,*

well if they're not going to bother why should I bother. So that whole quality of that PRD conversation can be quite vital, you know, if it's not done in a coaching manner. Sometimes I have had some excellent support where they have suggested things that would help move me forward and then I've just been left to my own devices."

George: "*I don't find [PRD process] particularly useful if I'm honest. That might be my fault, but I just felt like it was a form to fill out. I didn't feel like anyone was really looking at it. We didn't have a talk. I didn't really sit down with my headteacher or my line-manager and go over it and think about how we're going to fill it. It was just a webpage I had to type things into, and which was a shame really*."

Dani, a principal teacher, described his experience both being reviewed and reviewing teachers in his faculty and observed that the introduction of PU had had a negative impact on the PRD process, reducing meaningful discussion around professional learning and growth.

Dani: "*When the sign-off years [PU] were introduced it, that actually made it worse for me in a way, because it, it became more of a ticking box exercise compared to PRD, to just PRD, where you were engaged more in terms of a discussion with your line-manager, your PT, around CPD and what your, what your focus is and what you can do. The sign-off year almost became, okay that's the thing I need to do now to tick off my sign-off year*.
Stuart: "*So, in terms of the discussion that you have with your line-manager, do you feel that that's a productive discussion, or is it just tick the box, you know, and a sort of a mechanistic thing that doesn't really help your growth?*
Dani: "*I would say it's more of a mechanistic thing. Even the ones I have with folk in my faculty, for some of them, they, they just can't wait to get out of it and have the discussion as quick as they can. Others are a bit more, they have an idea, they know there's an area where they need to grow and they want, they do want to have a discussion around it, but overall, mostly it's more of a, let's just get this done and get back to the day-to-day job*."

To probe even further, in the follow-up interviews I explicitly asked participants if they had had a PRD meeting during the previous year. Only eight of the eleven teachers had, with several indicating it had been relatively brief and of little value. It appeared many saw the

PRD process as a hoop to jump through rather than a genuine opportunity to discuss professional learning needs, opportunities, or career progression as this conversation with John illustrates.

> John: "*I think it's one of these things that [principal teacher] knows that he should be doing it and it's an obligation on his part, and it's an entitlement on our part. Yeah, he is good at doing it, but I wouldn't say that it's a, it's never an inspiring hour. It's always a sort of, just a sort of opportunity for you to say what you want to get done in the next year ahead and he is effectively just taking a log of that*.
> Stuart: "*So, you know, does he suggest professional learning things that you might be able to do*?
> John: "*No, no he doesn't, he doesn't make any sort of suggestions*."

Even when professional learning needs had been identified during PRD meetings this has not always led to action to address these.

> David: "*I mean there's a couple of things I have asked about in and around [PRD], but [my line-manager has] just ended up non-responsive and then I've chased them up and then still no response and then I've just left it, and with other priorities I just gave up basically*."

It was obvious that the PRD and PU processes were rarely being implemented as intended and there was little discussion between teachers and their line-managers about their individual professional learning needs and how these might best be met. This lack of discussion and engagement was likely to exacerbate any disconnects between the individual professional learning needs of teachers and the departmental, faculty and whole-school improvement planning processes creating greater opportunities for these to pull in different directions and result in conflicts and frustrations. The school improvement planning process is an important opportunity for teachers to influence how policy is enacted in their context and to help ensure it aligns with their individual priorities, however, this was frequently described as a top-down process by teachers, and whilst many had opportunities to contribute or comment as part of the process most did not consider this to be particularly meaningful.

John: "*To be honest, [the depute headteacher] gives people the opportunity to comment on [the school improvement plan], but the problem is, is that it always happens at a time in the year when you're too busy really to devote any time to that*."

Inevitably in times of limited resources, prioritisation and decision-making regarding the professional learning for both individual teachers and groups of teachers, whether that be on a departmental, faculty, school, cluster, or local authority basis, can produce tensions in the system and lead to frustration for those involved. This is explored next.

Tensions in professional learning decision-making

Teachers having a lack of autonomy over decision-making has been shown to have a negative effect on teachers' job satisfaction and job retention (Worth & Van Den Brande, 2020), however, for good system-wide performance there needs to be some degree of consensus to allow teachers to work together in a common direction (Schmidt & Prawat, 2006). It was clear that many of the teacher participants in this study felt frustrated by the professional learning offered to them through their school and local authority and considered themselves to have little or no voice in the decision-making process regarding the provision of professional learning through such channels, several giving quite extensive and considered answers going beyond what might have been expected from the semi-structured interview starter questions. An extreme example is illustrated by the following:

Albert: "*We've had two previous deputes, I sort of feel the need to be careful what I say, … one of which … actually used to consider subject-specific CPD, including Understanding Standards events, as unprofessional. To the point where she would threaten to report you to the GTC [sound of exasperation]*.
Stuart: "*Yeah, that's a new one to me*.
Albert: "*Yeah, she had a very strange attitude to, yeah, anything that was related to your subject was unprofessional in her mind. It had to be whole-school stuff. And again, there was also, there was also this trend, some which is continuing to some degree nowadays, is you find that the school is not supportive of CPD if it doesn't fit in with their, I can't remember the name for it, but their sort of forward planning. If it doesn't fit in with sort of the whole school goals and stuff like that you find that, you find that trying to get on CPD of that nature is very difficult. Generally, you can sort of get round it if it's after school or on a Saturday because that's not impacting*

them but getting out of school to do something that is not in the school development plan is quite difficult at times. … in terms of trying to sort out the mess with the exams, the sort of, the [local authority physics teachers' network meetings] have come into their own. Yet, in recent years, I've literally had to fight to be allowed to go to them."

This clearly illustrates a significant disconnect and raises several questions including:

- Why was a teacher attending Understanding Standards events provided nationally for the different courses for each subject by the Scottish Qualifications Agency and subject network meetings provided by the local authority, both organised on the basis that a teacher from each secondary school attend, considered by the school depute as unprofessional?
- Why are teachers attending such events provided on a national and local authority basis to support teaching, learning and assessment not included in the school's improvement plan?
- Why was there such a clear disconnect between the professional learning decision-making by the depute headteacher in his school and with that of Albert, which in general was very much aligned with other teacher participants in this study, and with decisions made at a national and local authority level?

It was clear from his unfamiliarity with the school improvement planning process that Albert did not consider himself to have been involved in or consulted on such matters in a meaningful way. A well-considered description of similar issues regarding his views on the use of in-school collegiate time, which included in-service days intended for the professional learning of school staff, was given by Luke.

Luke: "*I find if you look at [school] now we've got various school improvement groups, but you know, they are dictated by above. You know, they may be beneficial for the school, but I don't think they're necessarily beneficial for the people in the groups. … [they] didn't benefit me in any way, shape or form I don't think. I go along to staff meetings, and I think, I think [sigh]. To give you, to give you my attitude towards staff meetings, I think the best one was tracking and monitoring. I went through this thought process, about a couple of years back during a staff meeting on tracking and monitoring. We were talking about how the school would track kids through the CfE*

levels, and how we would report on it, and we had had many, many, many meetings by this point, and I was getting more and more frustrated because I was looking around the room and just mentally adding up the wage bill. And I was thinking about how much it was costing and I was thinking about, well what we're doing is we're tracking kids from number one to number four over 10 years, how many staff meetings do we need to have about this, and I got quite frustrated and the thought processes kicked in that kind of occupies my thoughts during these meetings now and it's terrible, it's a mental health issue as far as I'm concerned, it's 'this is part of my working time agreement, I am paid to be here, it's up to them how they waste that', and it's a terrible thought to have and I feel really bad for thinking that but I get quite angry if I don't. I kind of feel that way about a lot of meetings still. On one hand, I feel like we're flushing money down the drain when we don't have it at times, and I think that's always going to be the case. If you start the school year and tell your headteacher that you've got to have so many meetings in a year, then that immediately ties your headteacher's hands because you've got to have them, and it creates two problems: one, that they are having meetings that they don't need to have, and the second one is eventually at some point the headteacher does need to have a meeting but there is no time left over in the working time agreement, so they can't have it. So, you know it is a double-edged sword on that one. So, I, in that regard, no I don't feel empowered, on the other hand though, and this is maybe me being a little bit, maybe it's my age, you know, I am maybe a new teacher but I'm not young anymore, and I do tend to take the point of view that what goes on in my classroom is my business. I know a lot of the younger teachers will feel the same, but I would much rather kind of beg forgiveness than ask permission in a way, so psychologically my four walls is my classroom and is what I control. I can't control what happens outwith that, but you know, when it comes to things like, you know, how I run my classes, behaviour management, and you know, I do, I do what I think is best for the kids in front of me, and I'll justify afterwards if I kind of have to do, and so in fairness to the school I haven't been questioned on what I am doing. You know, they're not coming to my door and saying, 'why did you do this, and why did you do that?', so I assume they must be reasonably supportive [laughter]. So, I do in that, in that regard I do feel quite empowered that way, but in terms of shaping what's

happening in the school, which direction education is going in, no, not at all, not in the slightest."

Luke also went on to make a similar point to Albert about those in leadership positions in his school and local authority not valuing or supporting staff participating in subject-specific CLPL.

> Luke: "*I don't feel that there is any great appetite for people to be doing subject-specific CPD*.
> Stuart: "*You mean not any appetite from the school?*
> Luke: "*Yes, from the school and from the authority, … I managed to get away to the IOP summer school a few years back, and that took quite a sales pitch, and it was on the basis that it would not cost the school a single penny that I managed to get away, and, and I kind of feel you shouldn't be having to sell things like that, it should be an absolute no-brainer*."

Experienced principal teacher, Gill, was able to reflect on her experiences of developments in professional learning policy, of professional learning initiatives and of decision-making in different schools during her career. She spoke at some length about her experiences including the poor implementation of some educational initiatives and the introduction of the contractual requirement for teachers to undertake professional learning which occurred relatively early in her career.

> Gill: "*I think that's the downside of getting [CLPL] wrong or getting it unimpactful is that people end up with a negative view of the whole CLPL process and it disengages them and they're like, ugh well, this is just going be a waste of time and, you know, that can be quite a powerful anti-change mechanism, because people think what is the point, you know, that's not going to make me any better, so that leads to stagnation and decline, and not engaging with current research, for example. It's counter, it's completely counterproductive if you get it wrong. … When I was at [previous school], that would have been '95 to '98 they had just introduced … PAT, Planned Activity Time, and I think we had, was it 50 hours we had to do a year, and that was basically, you know, waiting behind to 5 pm every Tuesday night. And it was actually quite shocking Stuart that there was so little in the way of activities planned [laughter], Planned Activity Time, yeah, you were forced to stay into 5 pm [laughter].*

You know, and so from a formal strategic point of view it was, you know, it was totally absent, there was nothing I would say that SLT, or the Council, or the Authority had planned.

Stuart: "*Do you think the fact that, you know, when PAT was introduced, you know, as a kind of contractual obligation, but that there wasn't an awful lot planned, do you think that generally then people saw that as an imposition which promoted negative views of doing professional learning, you know, even although you might have benefited from the informal discussions that you had? Do you feel that it was basically seen as a negative?*

Gill: "*Absolutely, I mean you know, I suppose I remember as well the change, you know, when the McCrone agreement came in. You know, and that, I wonder, you know, if there was an element of a reaction to that. You know, as you say, it was very much imposed and I think quite a lot of people resented it because it was, because unless the time was going to be used wisely and had been well planned and had been well prepared, I don't think how you could see it as anything but an imposition, but obviously I was young and enthusiastic and I made the most of it, and you know, there was a supportive member of the department to help me on most of those afternoons. … Somebody obviously had become aware, I don't know, you might know the background about why Planned Activity Time was introduced, but somebody had obviously realised that there was a need to continually upskill, update, refresh the knowledge and the skills of teachers, but they had thought about the why, but they hadn't thought about the how. … We need the people who are planning CLPL need to be modelling good practice themselves. And I have seen that, as I've said already, and when it works it really works, and when it doesn't, as you say, it switched people off*."

Although the introduction of Planned Activity Time was decades ago it was clear from Gill, and from other participants, there was a consensus that few lessons about the effective implementation of whole-school professional learning have been learned or actioned and participants generally thought that opportunities to use whole-school collegiate professional learning time were being squandered. Concerns were also expressed that there continued to be unrealistic expectations regarding the amount of professional learning and time needed to effect real change in practice and culture.

Dani: "*We have a leadership at the school where there's a thought that if you've had a little bit of input … then that's you, you can just take it forward, whereas I like to be prepared and have done what I think is enough professional learning where I'm confident to be able to take things forward rather than, okay you've had a session … of professional learning, that's enough for you to be doing it well*."

Despite Albert's earlier description of his difficulties attending out of school CLPL events many of the other participants described much more straightforward experiences obtaining permission to attend events such as SQA Understanding Standards events, SSERC courses, or the annual IOP Stirling conference, such as the situation described by Ava.

Ava: "*If I'm applying for CPD that has any impact on budget I just go straight to my head of faculty and he either recommends it or not. He always recommends it and then it goes on to the business manager and he either okays whatever funding is required or not. So obviously if it doesn't require funding or is supported, as so many of our things have been recently, by that Enthuse funding you're much more likely to be allowed to go*."

Other participants were clearly encouraged to participate in a range of CLPL activities, although some largely self-funded their own CLPL as described by George, the participant with arguably the most international and outward looking approach to his professional learning.

George: "*I feel very lucky, I've really enjoyed [a range of subject-specific CLPL activities]. I had to do all of this stuff myself.*
Stuart: "*So, in terms of, in terms of that aspect to it. Like, obviously things, you know, some of these things have taken place in the summer holidays but some will have required getting time out of school or potentially funding, or have you self-funded most of these yourself when it comes to travel expenses or things like that?*
George: "*Yeah, yeah. I just pay it; I don't mind paying it. Like so, but I've been quite lucky that my headteachers at [current school] and [previous school] were pretty positive and I said, if I could go on this and they'll be like "yep, no problem". And I think my first Stirling conference in 2012 [principal teacher] made me go to that actually. She said to go, which I think was really positive and good.*"

However, there was also some evidence of teachers self-censoring with respect to asking to go to events they would ideally like to attend. This was often for a mix of reasons, including thinking that permission was unlikely to be granted as illustrated below.

> John: "*There's maybe been a few years where, you know, I have already gone to something. So, on the years when there's been an Understanding Standards event, or when I've gone to the, when I have decided that I am going to the [Stirling] conference or, or the SSERC events that I have been reluctant if you like to chance my arm and ask for a second outing. But it's, I don't know whether it's a sort of thing on my behalf that I didn't want to leave my classes or whether sort of subconsciously I was thinking that the school wouldn't let me go. But I don't think there has been any overt, sort of, I can't remember any overt warning from the school that if you have already been out on one thing that you are not getting out again sort of thing. There is also, also a sort of feeling that it's a bit of a hassle to go from here. It takes two hours to get anywhere, and then if you are going to go somewhere well there is the expense of staying overnight and you don't want to land the authority with all these bills, but well it's a sort of unconscious type thing, the idea that you don't go*."

When discussing the decision-making processes for participating in CLPL, PRD (GTCS, 2019) and PU were rarely mentioned by teachers. Only Andrew described himself as purposefully using PRD as an opportunity to identify and raise with his line-manager CLPL activities he would wish to pursue on a planned basis, often a year or more in advance. He credited this approach to advice he had received from university lecturers during his PGDE year. As PRD and PU are designed to be the process by which CLPL is identified and agreed between a teacher and their line-manager and a requirement for teachers to maintain their GTCS registration to teach in Scottish schools this clearly shows a disconnect between national policy and practice. This also raises questions about teacher empowerment and their ability to demonstrate agency in relation to their professional learning and growth, and this is explored next.

5.4.9 Empowerment and teacher agency

Empowering all stakeholders in the Scottish education system has been a strong policy strand in recent years (Education Scotland, 2021a) and builds on the philosophy of Curriculum for Excellence and the Donaldson report on teacher education (Donaldson, 2010). Given the

limited response of participants to the question on the use of policy documents, I used supplementary questions to explore their views on empowerment and ability to exercise agency in relation to their professional learning. The responses were mixed and there was evidence that this was largely related to the culture in the different schools in which the participants worked, a point made by Clara.

> Clara: "*I think a lot of how empowered you feel, it emanates from the top [headteacher and school senior leadership team] and I've been very fortunate to feel empowered and respected and valued*."

Whereas Clara generally felt empowered and supported by her school's culture Albert's experience was more negative, and he considered himself to be less empowered than he had been earlier in his career.

> Albert: "*I do think there is a feeling in terms of the policies, the practices, is the difference between policy and practice, the policies are, yes all about teacher empowerment but the practices unless it is going to get, unless it fits in with a manager's career, you're not really going to be well supported. … You sort of feel when you come up with some of these things that used to happen in teaching and what I would, what I would consider teacher empowerment, you get looked at like you're crazy [laughter].*"

Similar to the situation described by Priestley et al. (2015, p79), participants generally considered themselves to be reasonably well empowered and able to demonstrate agency within their own classroom, and often within their own department, but much less so within their wider school community, and certainly not in terms of the overall education system, as described by David.

> David: "*In terms of day to day; yes empowered. You've got the opportunity to do things, try things, and ultimately be trusted to deliver things which is great, and in terms of the macro stuff and the curriculum and SQA content and, you know, education policy as a whole and career progression and all that stuff, no, absolutely not empowered*."

Even in situations when teachers considered themselves to be disempowered there was nevertheless evidence of them exercising agency and influencing activities in their

classrooms and departments going against the policy of their school or wishes of their line-manager. A good example was Ava, who considered herself to be disempowered at all levels as the following interview extract exemplifies.

> Stuart: "*I was just wondering if you felt that there had been a change in terms of the policy which you know meant you were feeling more empowered by the system?*
> Ava: "*I don't. [laughter] I just I don't think you do as a teacher, and I think when they talk about teacher empowerment it's lip service that they give to it. You know, they talk about teacher empowerment and then they nickel and dime you to death, with little itty bitty annoying regulations, you know. You have so little control or autonomy over what you do in a day. Trying to, trying to do, planning or deeper thinking about what you do. It is very hard to find time to do that, it really is. So no, I don't feel empowered as a teacher. It's all quite the reverse [laughter].*"

However, Ava also showed she could exhibit significant agency, or individual activism (Sachs, 2003b, p33) when, following Perimeter Institute professional learning workshops where she gained new knowledge and resources she thought would be beneficial to the learning of pupils, she was told by her head of faculty to not implement any of the changes. Nevertheless, she implemented the curriculum changes anyway and supported colleagues implement the changes too.

> Ava: "*… so despite the fact that we weren't, you know, I was basically told not to, I did it anyway. It all got incorporated. Who's going to know what you're doing in your classroom? So, all of that stuff gets used every year*."

Ava's act of resistance appeared to be one driven by a desire to use her professional learning to promote positive change in the practices of the physics teachers in her faculty and the learning of its pupils, and might be described as an example of a "*micro-practice of resistance*" (Ball et al., 2012, p63). This incident may only be an example of the exercising of unnecessary managerialism on the part of her head of faculty, or his desire to protect departmental staff from additional workload, but is nevertheless an example of a school culture where there appears to have been a misalignment between a teacher's participation in professional learning and this feeding forward into improving teaching and learning. This resulted in frustration and considerable disillusionment on the part of the teacher involved.

The approach to school improvement planning varies with, and no doubt affects, the culture in different schools. Most teachers considered they had little opportunity to shape their school improvement plan, Calum being the only real exception. More typical responses were:

> Gill: "*I suppose we were given a little bit of an opportunity to make any comments [on the school improvement plan], but it was effectively written at that point*."

> Albert: "*I would say we have no input into the school improvement plan. We occasionally get a trawl for evidence, but it's not really a two-way process*."

Perhaps it was a function of neither the school improvement planning or PRD processes functioning particularly well for many of the participants, but it appeared few were able to demonstrate a great deal of agency or empowerment through these official processes, despite several demonstrating this in other aspects of their work. That Andrew was exhibiting a higher level of agency in using such processes to shape his professional learning journey and to ensure his own professional learning needs were integrated alongside the wider whole-school development needs, perhaps explains why he was more content about his professional learning journey, and how his lived professional learning journey was relatively close to his ideal professional learning journey compared to many of the other participants. What the participants considered to be their ideal professional learning journeys will now be explored in the next section, together with some of the reasons why these have not already been realised.

5.4.10 Ideal professional learning journeys and the barriers to their realisation

Unfortunately, none of the participants gave as considered, clear and concise an answer to this question as Calum during the pilot interview, an indication that this was not something they had given much thought to on a regular basis which correlates with poor use of the PRD process. However, the discussions with the participants uncovered several common themes in what they considered to be their ideal professional learning journey for the next few years which matched quite closely to the answer provided by Calum. As the interviews took place in 2021-2022 participants were asked to answer assuming lockdown and social distancing due to the COVID-19 pandemic, as well as other potential barriers, did not apply.

Subject-specific professional learning

Teachers in Scottish secondary schools are generally GTCS registered in the subject(s) they teach, and their professional identity is strongly bound to this subject identity (Thorburn, 2014). All but the smallest secondary schools are also divided into departments or faculties. These are more than just administrative units but also serve to provide the working context for many secondary teachers and thus contribute to the professional identity of teachers (Brooks, 2016; Helms, 1998; Siskin, 1994). Within this context it is perhaps unsurprising that the most common theme emerging was the desire for good subject-specific learning with the delivery of this taking several forms. There was a desire to see more time prioritised for collaboration with colleagues, for well-functioning local networks of physics teachers, and for the well-regarded professional learning provided by IOP and SSERC.

Many, but not all, of the participants had attended the IOP Stirling conference and/or the joint IOP/SSERC summer school. These were clearly regarded as the two most significant annual conferences for physics teachers in Scotland. There was a general desire from participants to attend these on a frequent basis.

> John: "*I would love to go along to the [Stirling] conference every year*."

> Neal: "*The ideal one for me would be to come back to the summer school and then go to the Stirling conference*."

> Dani: "*If I could attend the Stirling meeting every year and go to the summer school every so often it would be great*."

A few of the participants mentioned attending one of the international residential summer schools organised by organisations such as CERN, ESA, or the Perimeter Institute.

> Ava: "*You know, what I really, really, really would love to do, I would love to do one of those trips to Perimeter. That, if I, if that was my dream if they said, the budget was there, I would love to go and do that, I would absolutely love to do that, I think that would be so much fun*."

George, who had attended a few national and international conferences during his decade long career, highlighted how he considered the immersive nature of residential events to be

an important feature where participants could focus fully on professional learning away from day-to-day interruptions. Others commented positively on the extended informal networking opportunities residential events provide.

Three of the participants said they would like to spend some time on industry placements and/or in university research departments to improve their ability to inform pupils of career options as well as keeping up-to-date with developments in research and industry. Several participants mentioned reading journals and books and listening to scientific podcasts as ways of keeping abreast of developments in physics.

Several of the participants specifically mentioned a need for support for teaching Advanced Higher. The more advanced nature of the topics covered, and that some teachers were new to teaching the course or only taught it infrequently, resulted in it being singled out for specific mention. Support for teaching practical work was also mentioned several times and SSERC's professional learning was regarded highly in significant part due to its focus on practical work. However, the need for time to explore equipment and practical work with colleagues also came up several times.

> Luke: "*You know we've got old, old equipment that's there that could be used for teaching that I have not got the experience, and of course [physics teacher colleague] is new so neither does he. I'm sure it could be made to work and be brought into function. I'm thinking of kind of some of the old stuff for gas laws for National 5 that actually I could do with just a few hours to play about with and get it working and then we could use it for teaching classes rather than just here's Virtual National 5 Physics, look at the meter*."

The sharing of knowledge and experience was seen as an important function of subject networks and something that IOP Teacher Network events, whether online or face-to-face, performed.

> Luke: "*I went and did the [IOP/Perimeter Institute] climate change thing which I really liked, I thought that was very good. I'm liking stuff like that, so in terms of the delivery, I think that's great and it's also quite handy to have stuff signposted. It's not lots of stuff but, you know, like the IOP Spark website you know, like just to know this is where you can look for, and that's really handy*."

This professional learning included face-to-face, live online, and video-based professional learning activities exploring the pedagogical content knowledge required and strategies for teaching specific physics concepts.

> Albert: "*I think actually at a personal level in terms of my physics teaching I would like to see more of, here's an idea, a concept, or an experiment in physics and here's the best way to get it across.*"

Most of the discussion of their ideal professional learning was very much situated within the context of improving the teaching of physics, as might be expected for a group of physics teacher participants, and as discussed in chapter 3.5.3 there are good reasons for why subject-specific work should contribute a significant part of programmes of professional learning. Although it was the overwhelming desire of the teacher participants that their ideal professional learning journey should contain more subject-specific professional learning, a few also spoke about more generic pedagogical approaches and whole-school initiatives.

Generic professional learning

Andrew and Dani's involvement in the *Excelerate* programme affected their responses compared to other participants. These initiatives had a focus on introducing pedagogies such as flipped learning and PBL and both Andrew and Dani highlighted their need for, and interest in, professional learning on such topics, however, not to the exclusion of subject-specific learning.

> Dani: "*For me I need more professional learning that's going to fit with the ethos of the school and the direction that the school is going in, and I think that will be available because of the Excelerate programme*. *I wouldn't want to miss out on the IOP stuff, and the SSERC stuff, and the subject-specific things that give you that enthusiasm and refreshes your passion for the subject and for teaching the subject.*"

In more general terms, at least partially influenced by the COVID-19 pandemic, several participants identified the need for professional learning on digital skills. However, when discussing more generic professional learning topics such as digital skills, cognitive science, formative assessment or feedback, the preference was always for the professional learning to be closely related to either their context or needs as a physics teacher.

Peer observation, coaching, and mentoring

Having opportunities for peer observation, including visiting other schools to observe and collaborate with other physics teachers with relevant experience and expertise, was identified by several participants as something they would wish to do. Few had had opportunities to do this in the past, especially teachers in small more remote schools.

> George: "*The other thing that I would really like, which I think is maybe a bit of a pipe dream, but when I was training having people observed my lessons, I found that incredible. Like [ITE lecturer] observe my lessons. I don't think that's going to be possible to get someone like [ITE lecturer] to come and observe my lessons and give me verbal feedback. I found that incredibly useful and I haven't had that since my PGCE*."

Neal also emphasised quite strongly a desire to spend more time working collaboratively with colleagues in associated primary schools, both learning from them but also assisting with their professional learning to improve their capacity and confidence teaching science.

A desire for coaching or mentoring was only raised by Dani and Gill. In both cases this was in relation to their growth as a leader and manager in a promoted post rather than for growth as a teacher. As an aspiring depute headteacher, Gill was also looking towards Education Scotland and local authority provided leadership courses to form a significant part of her professional learning journey during the next year or two as well as taking practical leadership opportunities within her school. This marked difference between the ideal professional learning journey described by Gill and those of all other participants was clearly due to different aspirations for her future career path compared to other participants. That so few participants had experienced coaching or mentoring beyond their probationary period or considered it an achievable option was perhaps reflected in it being referred to so little in their ideal professional learning journeys despite the effectiveness of such approaches reported in the literature (Cobb et al., 2018; Knight, 2018; Kraft et al., 2018; Rhodes & Beneicke, 2002; Sims et al., 2021) and the broader desire of all participants to collaborate with colleagues.

Postgraduate study

In the participant group there was little interest in pursuing masters-level study or other credit bearing courses. Andrew, the most recent entrant into teaching of the participants, was in the process of completing an MEd building on the masters-level credits he had obtained as part of his PGDE. The only other participant stating a clear desire to complete a masters-level qualification was Albert. He had already completed a doctorate before becoming a teacher as well as additional undergraduate study to obtain an additional teaching qualification in another subject. He had explored doing an MEd but considered those available locally to be "*very focused on sort of career development, headship, that type of thing*" whereas he wished to study for a masters in physics education research (PER) with a clear focus on improving physics teaching but did not consider this to be available. Albert's preferred model appears to be more consistent with masters and doctorate courses available in parts of Europe and North America where physics teacher education is often housed within university physics faculties, rather than in education faculties as is generally the case in Scotland. This would perhaps allow a greater cross-over between the study of a subject discipline and education.

Gill, despite recently studying a subject-specific PGCert to support the teaching of an additional subject, was not positively disposed to completing a masters-level qualification. This was despite her aspiration to enter school senior leadership and it now being compulsory for applicants for headship in Scottish schools to complete the *Into Headship* masters-level qualification (Education Scotland, n.d.-e; GTCS, n.d.-b)

> Gill: "*I would have liked there to be opportunities for people to upskill … I think I'd like there to be a better course out there for moving into SLT [senior leadership team] that maybe didn't involve an academic, the investment in time from a degree course. You know, because as I say, doing an MSc or a post graduate course is just so hugely time consuming and not everyone can commit to that*."

There was a general desire to engage with educational research literature with several of the participants referring to reading education books and listening to podcasts and Gill and Andrew both wishing to restart education book clubs in their schools which had ceased during the COVID-19 pandemic. It was clear that there were barriers and/or a lack of adequate incentives and/or a lack of appropriate availability for teachers to engage in

masters-level study. The barriers to the participants following their ideal professional learning journey are explored in the next section.

Barriers to professional learning

Every participant stated that lack of time was a barrier to engaging in professional learning activities and many also stated that lack of time often hampered effective implementation of curriculum or pedagogical change following existing professional learning. This is consistent with the observation of the OECD team during the review of Curriculum for Excellence that Scottish teachers had one of the highest class contact times of OECD countries and this prevented teachers from being able to be effective curriculum makers at a local level (OECD, 2021, p125). Although excessive workload was mentioned by participants relatively few times compared to insufficient time, this was implicit in what was being said about a lack of time.

> David: "*The podcasts, … it's just again workload and, you know, they've dulled in my memory, … so I really need to go back to podcasts and listen to them again when I get time to do it. … So, I haven't had enough time to delve into it and to give it the thinking time, and again that absence of being able to discuss face-to-face and debate with others, particularly in your own subject matter. It'd be great to have a little, you know, intellectual discussion on these things and see how anybody else has implemented them and what they've thought of it rather than one person thinking about it and then implementing it on their own. That's definitely an area, you know, the things like the [IOP/SSERC] summer school, they are just totally invaluable and to get around after the events in the evenings and have a good chat. There's just not enough of that in a year, in my opinion*."

The issue of lack of time applied not just to the contracted working week of teachers. Many of the participants, not only those living on islands, described not being able to attend conferences or even twilight network meetings or workshops due to the distances and travel time involved or the conflicts with child-care and other aspects of their private lives. For example, Gill, despite a long and active career, had not attended any national conferences due to conflicts with child-care and spouse working patterns making it difficult to be away overnight and her not wishing to attend events at the weekends. Several participants also described difficulty attending online sessions.

Gill: "*We were all signed up, and I asked as well to sign up, to the World Education Summit that happened towards the end of March, and I would have liked to have been involved in that but, at the time, staffing was really challenging with COVID absences and other absences. So, I wasn't actually able to attend any of those online sessions*."

Whilst the geography of some areas in the Northern Alliance allows for relatively easy afternoon or twilight networking events, teachers in other areas have large distances to travel and ferry crossings making such meetings very difficult. The distance to the Central Belt of Scotland was referred to by several participants. Whilst perhaps not always articulated explicitly, many of the participants clearly considered themselves to be remote from locations where they perceived significant professional learning events take place, such as SSERC in Dunfermline or the Scottish Learning Festival in Glasgow.

Ava: "*Well, I've never known a colleague go to the Scottish Learning Festival because it's so far away, it's too costly*."

Neal: "*It would be nice to go to the Scottish Learning Festival for instance but again that boils down to cost. You know, I think the more experiences you get to go to, or the more chances you get to go to these sorts of things the better. It can only but help our professional learning*."

For teachers in more remote locations to attend national events incurs additional travel and overnight accommodation costs compared to teachers living more centrally. Some participants also reported difficulty obtaining permission to attend multi-day events due to problems obtaining cover teachers for classes or the unwillingness of senior leaders in schools to grant release.

Albert: "*I've always wanted to go to the IOP [Stirling conference and summer school] but it's like, yeah, 'you can't have three days off work to go to it', that type of problem*."

It was disappointing to hear these accounts as the IOP/SSERC summer school comes with an Enthuse bursary sufficient to pay for the costs of a cover teacher, something several participants commented on favourably.

David: "*I think it's the key thing is that … the way that SSERC was funded and how it supports and can provide support, by providing you with supply teacher cover, it provides a bursary for accommodation and getting there. You know all those things are immensely important and some of them get Enthuse funding. You know, it's just making sure that somebody out there gets that feedback that it is important, and please keep it going*."

However, despite this funding being available it appeared that many participants struggled to obtain permission to attend such professional learning.

Dani: "*Getting out of school is the sticking point but I would absolutely love to attend IOP [Stirling conference and summer school], you know, go every time. There's the CERN thing [summer school in Switzerland] that comes up on SPUTNIK, I wish I could, and it just never, I don't know, it's always the big things for me, the big events, I do wish I could go to as many of those as I could*."

Comments from participants also sometimes showed a lack of full understanding regarding some of the international summer school events generally held during the summer holiday and funded by research organisations or sponsored by industry, and so often only require travel expenses. The barriers of time out of school and funding perhaps being perceived as greater than might be the case. There was also evidence of teachers self-censoring in asking for permission to attend events, often for a complex mix of reasons including personal and family commitments, concerns about lack of funding, lack of available supply cover, cost of travel and accommodation, and disruption to their classes, similar reasons to those mentioned in the literature discussed in chapter 3.4. Most participants stated that lack of funding for participation in professional learning activities restricted their participation, George being an exception in stating he willingly self-funded his attendance at conferences in Scotland and further afield. However, several, including George, made the point that there were wider issues regarding a lack of resource. This included support to facilitate collaborative professional learning activities with colleagues in local schools as well as time and money for organising or attending events.

George: "*The only time for example since I have been at [school] that I've met other physics teachers in the local area were the two in-service days last year when we met to do cross-marking. I met [teacher] and he was really nice, but I haven't met him*

since, and it would be nice if there was a bit of money [to allow this]. Like even I think [teacher] had to ask his boss to get them to buy sandwiches and stuff [for our meeting] but there was no funding, and [teacher] was quite upset about it all and it's just strange that I can see myself working here for another five years and never seeing them again which I think is bizarre."

Neal: "*In terms of our authority you have very, very little support about setting stuff up or using stuff. We have kind of done it almost amongst ourselves, or we have used the Institute of Physics stuff or whatever. … undoubtedly we have to learn professionally but we have to have the time to be able to do that. The time and the resources, whatever the resources may be, because resources is not just about money*."

As well as time and funding to access it, some considered the availability of subject-specific professional learning to be insufficient, and this was more frequently the case for subjects they taught other than physics.

Gill: "*I think it's just, it's really, it's that frustration of finding CLPL that meets your needs*.
Stuart: "*Yeah, so there is basically a shortage of good quality, subject specific CLPL*.
Gill: "*I would say so. … I don't know of much that is subject-based*."

Neal: "*I still would like a bit more subject-specific. You know we get very little; in fact, we get nothing in our authority really*."

Several participants also exhibited confusion or commented on it being difficult to determine the respective roles of Education Scotland, RICs, and local authorities and what professional learning opportunities were available from them. At the initial interviews none of the teachers had participated in any Northern Alliance professional learning or were aware of any relevant professional learning provided by it. A year later Clara and George had participated in Northern Alliance professional learning in mathematics/numeracy, and Gill had participated in online sessions on the use of ICT and formative assessment, however, the situation had changed little for other teachers. This suggests slow change in the impact of the RICs with regards to the support of classroom teachers, particularly in terms of physics and science, despite the rapid acceptance and ease of online working during this period.

Two participants suggested that with the increased use of electronic communication and social media things appeared more fragmented and it was more difficult to determine what professional learning a local authority had on offer compared to when hard-copy catalogues were used or when there had been a local authority officer with a clearly recognised remit for organising and disseminating information about professional learning activities.

> John: "*I think really that if there is anything that needs to happen with regards to opportunity is that it's just that you need to be a wee bit more aware of the opportunities that are out there. There is all of the SSERC stuff or any of the IOP online learning that I have been looking at in the last couple of weeks is that I have got all of the information for that through SPUTNIK [IOP email forum for Scottish physics teachers]. There has been no, erm, the authority itself hasn't been, it isn't very proactive at letting you know what opportunities are available out there. And that's something that's changed because I remember when I first started teaching, they used to issue a catalogue of CPD opportunities at the start of the year*."

This is consistent with the findings of the OECD team reviewing Curriculum for Excellence which reported that although many professional learning opportunities were available the practitioners interviewed repeatedly requested more clarity on the support available and a more streamlined offer, that practitioners relied on their own knowledge and research to identify appropriate professional learning opportunities (OECD, 2021, p86), and that RICs had provided less support than intended (OECD, 2021, p63).

Several participants commented on the commonly used 'cascade' method for disseminating information gained during professional learning activities as a barrier to effective professional learning occurring. No-one considered this to be an effective method, and that many valuable professional learning opportunities were being squandered as a result.

> Ava: "*I've been away at the summer school or something like that you're away for three/four days you pick up all sorts of things and to be expected to come back and try and pass that all on in 20 minutes over a lunchtime is ridiculous. It's completely inefficient and it's also an inefficient use of the school's CPD, you know, whatever budget, they have for that. It would be so much better if you could come back and actually have protected time to pass that on*."

It is common when local authority physics teacher network meetings take place for only one representative from each school to attend, sometimes on a rotation basis, with this person responsible for cascading information back to other staff. Due to the inefficiency of this process many considered these meetings should be attended by all physics teaching staff, which has the added benefit of a greater consistency of attendance from meeting to meeting. The COVID-19 pandemic had had a positive effect in some local authorities as face-to-face network meetings had been replaced by online meetings which allowed more easily all physics teachers from each school to attend. Whilst such online meetings were not seen to be an effective replacement for all aspects of face-to-face meetings, the improved equity of access was seen to be a major advantage.

With the interviews taking place during the COVID-19 pandemic it was inevitable that the responses of participants were coloured by their experiences of this. The move to online professional learning was universally seen as having beneficial aspects in terms of improved equity of access and many participants wished to see the continuation of the online provision provided by IOP and SSERC alongside face-to-face activities. However, there were also concerns expressed that there might be attempts by school and system leaders to replace too much of the professional learning delivered previously face-to-face with online delivery. This was seen as likely to have a detrimental impact on professional learning, especially that on practical work, and on the informal opportunities that can be the serendipitous catalyst for developments and which are frequently overlooked or not given adequate recognition (Eraut, 2011; Evans, 2019).

> Neal: "*I do wonder how much of [CLPL] will now be done online because we now know that we can do it. My fear, and you know I think that's good because you are more likely that people like me are going to get to go because it doesn't have a financial cost, but what I would worry about is the actual face-to-face interaction, and I hate jargon words but I can't think of another word to use, and the networking that you do when you are at these events, you know, the ability to get to know people and then to be able to bounce ideas off people*."

Several teachers referred to accountability pressures acting against innovation or teachers' ability to demonstrate positive agency in terms of taking ownership of their professional

learning and other aspects of their work. Dani referred to teachers being "*compliant*" to an agenda set by others and when probed further on what he meant by this he responded:

> Dani: "*Nobody wants to do anything wrong, they're, they're afraid of putting a toe out of line, and then the SQA or somebody saying, oh you're doing this wrong, or this isn't right and we're going to [sigh]. You know, I think they don't feel that the process with SQA or with HMIe is supportive, I certainly feel that way sometimes, that the processes that we have in place isn't supportive, it's more, we'll scrutinize you, then you are doing this wrong, so there is a black mark against you, this type of thing*."

Such comments show that cultures of managerial professionalism are still strong in many schools.

5.4.11 Summary

All teacher participants, despite being time poor, were positively disposed to professional learning in principle. Several spent considerable time and effort attending courses and workshops, doing MOOCs, listening to podcasts, and reading books; sometimes self-funding these when other support was not available. At no time did any participant report engaging in any enquiry-based professional learning. Most were negatively disposed to much of the professional learning available to them through their school, local authority, or regional and national agencies despite a clear desire to engage in high-quality, collaborative professional learning with colleagues, particularly those in their subject domain. Participants at times displayed despondency, resignation, anger, disengagement, and defiance especially in relation to professional learning which they considered to be imposed upon them and that which they considered to be driven by accountability agendas promoting managerial professionalism rather than that focussed on transforming classroom practices.

Having set out the findings from my three data sources, the next chapter considers the findings in relation to the research questions.

Chapter 6 Discussion

In this chapter the themes which have emerged from the analysis of the three data sets are discussed in relation to the three research questions, much of this being in relation to the third question which draws together and compares data from the three data sources and addresses the alignment between policy and practice.

6.1 Research question 1

RQ1 What does current policy tell us about teacher career-long professional learning?

Analysis of national policy documents relating to professional learning in Scotland is given in chapter 5.1. There is a good baseline provision of time for professional learning within teachers' contracts. Compared to the historical context described in chapter 2.3, the direction of travel for much of the content of, and rhetoric around, the policy documentation is one that promotes transformative conceptions of professionalism, and with this increased teacher agency. This can be seen in the GTCS professional standards (GTCS, 2012b, 2012d) published following the Donaldson (2010) report with further progress in this direction in the more recent revisions (GTCS, 2021b, 2021a), and with the publication of the National Model of Professional Learning (Education Scotland, 2019a). However, there are nevertheless mixed messages with managerial conceptions of professionalism promoted, especially in school evaluation and improvement documents (Education Scotland, 2015; Scottish Government, 2021a), that particularly shape the professional learning provided 'within the system' by actors in the meso-level. Apart from the rather vague and unreferenced assertions in the GTCS professional standards and the National Model of Professional Learning with respect to the importance of aspects such as enquiry and collaboration, there is little guidance about the modes of professional learning or any justification for using particular modes in any given situation. There also is effectively no advice or guidance about appropriate content for professional learning, this therefore being heavily reliant on individuals being able to display agency to help shape this to their needs. For a teacher or school leader to gain a good understanding of effective fit-for-purpose professional learning, as discussed in chapter 3, further research, reading, or professional learning will almost certainly be required, something of a challenge for time-poor practitioners.

6.2 Research question 2

RQ2 How can we chart teacher professional learning experiences and what does this tell us about teacher career-long professional learning in practice?

6.2.1 Charting professional learning

Attempts to chart teachers' professional learning journeys using the roadmaps and diary-logs proved to be limited in themselves. The commitment asked of teachers to complete a diary-log as they participated in professional learning and to revisit and reflect on entries proved to be too onerous, perhaps unsurprising given the pressures on teachers' time (EIS, n.d.-b; OECD, 2022). However, teachers are expected to keep a reflective record of their professional learning to meet the mandatory requirements for registration as a teacher (GTCS, 2021b, p11) and as part of their Professional Review and Development (PRD) process (GTCS, 2019, p14), so in theory asking teachers to complete a diary-log for this study should not have caused significant additional workload. There was little evidence that the lack of recording was because the demands of this study was causing duplication of effort on the part of the teachers involved. That the recording of, and reflection on, professional learning appears to have been too onerous for the majority suggests few teachers are doing this as national policy recommends and raises questions about what an appropriate level of recording ought to be, especially for time-poor practitioners. It also raises questions about what teachers and their line-managers recognise as professional learning and whether the PRD recording process, widely recognised as cumbersome, emphasises the conceptualisation of professional learning as 'going on courses' and other relatively transmissive activities rather than more collaborative, enquiry, and informal approaches more integrated into the day-to-day work of teachers. This is consistent with information reported by Eraut (2012) and Evans (2019). Teachers did not always recognise and/or record professional learning when it occurred, despite attempts to 'train' participants during the initial interviews and to make the recording of different modes of professional learning easy by using drop-down menus in the diary-log. Informal professional learning with colleagues and that associated with curriculum development and other ongoing work of teachers was almost certainly underreported by all participants.

To achieve a more accurate account of the professional learning of teachers, particularly the more informal professional learning with colleagues, it may be necessary to take an

ethnographical approach of the type used by McNicholl et al. (2013) where observations of teachers' practice are made in addition to interviews. Such an approach is expensive to conduct at scale and there is a danger that the presence of an observer changes the nature of the professional learning activities and interactions being observed.

Useful data were gathered by using the roadmaps and diary-logs which helped elicit more detailed and nuanced responses during interviews. The interviews allowed me to probe more deeply into the lived experiences of teachers and provided a rich source of data. Therefore, the findings in chapters 5.3 and 5.4 give a good baseline to compare with the analysis of policy documents and the views of the leaders to assess the alignment of practice with policy. Before doing so the professional learning experiences of teachers are analysed using an appropriate theoretical framework synthesised from the literature reviewed in chapter 3.

6.2.2 Teacher professional learning experiences

As has been discussed in chapter 3.2.1, there is a range of purposes for professional learning and if the full range of teachers' needs are to be met one would expect teachers to have some experience of professional learning from across all parts of Kennedy's (2014, p693) spectrum of professional learning models, see figure 6 on p44. It therefore provides a good framework to assess the range of professional learning available to teachers. A second useful framework for analysis is Timperley's (2008) ten principles for effective professional learning, see table 1 on p46. It is reasonable to assume that if professional learning activities display more of these principles, then professional growth in participants will be more likely. Professional growth in teachers is likely to also result in improvements in the education system (Mourshed et al., 2010). Finally, the model of enquiry-based professional learning, see figure 16 on p91, is used to assess whether teachers can construct programmes of micro-events which embed enquiry as stance. Together these provide a framework for the assessment of the quality of professional learning experiences available to teachers. Each will be discussed in turn.

6.2.3 Kennedy's framework

On comparing the learning journeys of the participants with Kennedy's framework, see figure 6 on p44, an immediate first conclusion is there is little or no evidence of collaborative

professional enquiry models of professional learning. None of the participants spoke of undertaking any forms of practitioner enquiry or action research in a planned cyclical way such as those described by Korthagen and Kessels (1999, p13), Timperley et al. (2007, pxliii), and Donohoo and Velasco (2016, p6) with only Andrew describing being involved in learning trios, but with limited success. It is therefore very unlikely that truly transformative professional learning was occurring and as a result the capacity for developing professional autonomy and teacher agency is arguably being limited.

There was some, albeit limited, evidence of the four models of professional learning in Kennedy's middle malleable category, but all tending toward transmissive rather than transformative. Regarding award-bearing models, only Andrew and Albert showed a strong interest in undertaking masters-level study, and although Gill had recently completed a PGCert course she was disinclined to study for a masters degree even with the ramification that might have for future promotion. An important element of this situation, and one raised by Calum during the pilot interview, is the lack of incentives for classroom teachers to undertake masters-level study, including financial support for the attendant course fees. Since the ending of the chartered teacher scheme (Ingvarson, 2019, p18; McCormac, 2011, p30), except for masters-level courses on leadership primarily aimed at teachers seeking to go into school senior leadership, there has been little incentive to undertake masters-level study. This is especially the case for teachers wishing to remain predominantly as classroom teachers where there is little incentive other than their own intrinsic motivation. Albert also highlighted the lack of provision of the type of masters-level course which he considered best met his needs as a classroom teacher, one with a focus on physics pedagogical content knowledge and physics education research.

Kennedy developed her framework when both the GTCS professional standards and the chartered teacher scheme were new developments and states:

> "*There is clearly capacity for standards to be used to scaffold professional development and to provide a common language, thereby enabling greater dialogue between teachers, but these advantages must be tempered by acknowledgement of the potential for standards to narrow conceptions of teaching or, indeed, to render it unnecessary for teachers to consider alternative conceptions outwith those promoted by the standards*." (Kennedy, 2005, p242)

Far from being used as a scaffold for identifying needs or planning professional learning it appears that the GTCS professional standards are rarely used in this way by the participants in this study, with the majority considering the GTCS professional standards only insofar as required to complete PRD and Professional Update (PU) recording processes, what many considered to be 'tick-box' exercises. For the participants in this study at least, there was little evidence of standards-based models of professional learning or that the GTCS professional standards were influencing teachers' professional learning planning in any meaningful way. The fears expressed by Kennedy in 2005 that the GTCS professional standards would narrow the conception of teaching and of teacher professional learning have not been realised. It also appears that the professional standards have not provided a common language for teachers to have a dialogue about their work.

All participants had experienced being mentored early in their careers. Only Dani had subsequently experienced a systematic programme of coaching, and this was related to his role as a middle leader rather than as a classroom teacher. George had been receiving mentoring, but only to support him teach a subject for which he was not qualified during a time of staffing difficulty. Coaching and mentoring was rarely raised as part of participants' ideal learning journeys, perhaps as a result of unfamiliarity with the possibilities such professional learning might deliver (Kraft et al., 2018). Despite this lack of formal coaching and mentoring many participants described receiving valuable support from colleagues, however, this would be better categorised as a community of practice model (Wenger, 1998).

All participants described characteristics of working with colleagues in communities of practice, such as with departmental colleagues, other school colleagues, or other local physics teachers. However, most of this activity was relatively informal, and although there were schedules of meetings and other planned activities there was limited evidence of carry forward from meeting to meeting and no evidence of cycles of enquiry being used as a professional learning strategy. Informal support of, and from, colleagues occurred frequently but not all participants saw these interactions as good professional learning opportunities. Many participants reported that departmental or faculty meetings were dominated by administration rather than used as professional learning opportunities. In-service days were also regarded poorly, and to mostly consist of administration or one-off activities with little or no follow-up to embed any learning into practice. Local authority physics teacher networks were more variable with some operating well but others poorly or were non-

existent. Where these networks worked well this was seen to be largely down to one or more proactive physics teachers taking on a leadership role for the group by default on a voluntary basis rather than any planned or facilitated support from the local authority. Both Dani and Andrew were in schools engaged in whole-school professional learning initiatives which were providing a greater level of structure and direction to the professional learning of many staff in their schools. However, during the year between interviews some of their original enthusiasm for this had waned. Other participants reported similar initiatives in the past in other schools having little or no lasting impact as there had not been sustained effort to embed or habitualise changes into the culture and working of the schools.

The vast majority of the professional learning activities described by participants could be categorised as one of Kennedy's three transmissive models: training, deficit, and cascade. Often these were directed, compulsory events in schools which were not well matched to the needs of participants. There were also situations where participants had identified a training need or a deficit in their knowledge or skills and attended a one-off event or undertaken some private reading or online study to address this with these micro-level professional learning events potentially leading to significant professional growth.

Perhaps the most scathing comments by participants were in respect of the cascade model of professional learning where a single member of staff from a school was expected to attend an event, such as SQA Understanding Standards or local authority physics teacher network meeting, and then feed back to other colleagues not allowed to attend the event. That little time was then built into busy school schedules to facilitate further dissemination to others was clearly a frustration for many and was seen as part of a wider problem of insufficient time being allowed for follow-up activities, opportunities to properly embed changes into practice, or to evaluate impact. This is consistent with problems with the cascade model reported elsewhere (Bett, 2016, p4; Perry & Bevins, 2019, p391) and the innovation, policy and institution overload reported by the OECD when it reviewed Scotland's curriculum (OECD, 2021, p12).

6.2.4 Timperley's framework

Whilst it would be possible to analyse individual professional learning activities against Timperley's ten principles, see p46, to determine how effective each is likely to have been, here I take a more holistic approach for the professional learning experiences of the

participants. This is consistent with the fact that Timperley (2008, p28) states that her principles are interdependent and also with professional growth being a reflective process occurring over time.

All participants clearly aimed to improve pupil learning, and all commented on the usefulness of subject-specific professional learning experiences as these are directly related to the teaching and learning taking place in their classrooms daily. More generic professional learning was consistently rated less well by participants precisely because it impacted less directly on day-to-day teaching and learning activities, and they could see less well how they might use it to change their practices to improve the learning of their pupils. This is consistent with the findings of the evidence review of Cordingley et al. (2018) where they reported that high-performing education systems frequently focus professional learning on developing the subject expertise of teachers. Many participants clearly considered the most worthwhile content of professional learning activities to be things that could be applied in their classrooms with little need for adaption or time for them to transfer it into their context. The general outlook of participants with regard to professional learning was relatively reactive and short term, perhaps a symptom of teachers being time-poor (OECD, 2021, p22). National Qualifications curriculum and assessment changes, which had been changing almost continually for eight years prior io the participants' involvement in the study, had also been a key driver for many teachers' recent professional learning. This continual change was likely to contribute to the short-termism observed rather than allowing for a focus on deeper pedagogical issues that a more stable curriculum and assessment environment would provide. The OECD review of CfE identified how such policy overload results in a system in constant reactive mode (OECD, 2021, p105) and there is a need to stabilise curriculum and assessment change to allow teachers, and leaders, to focus on professional learning that best improves teaching and learning.

It appears that a significant part of why the professional learning offered by SSERC was rated so highly by participants compared to much of the in-school or local authority provided professional learning, was because it integrates new subject content and pedagogical content knowledge with the development of physics practical skills; practical work forming a significant part of physics and science teaching. Ava's high praise for Perimeter Institute professional learning was because it integrated new physics subject content knowledge with more generic pedagogical skills, such as questioning, and with alternative teaching practices.

She rated this much higher than more generic Teacher Learning Community professional learning on developing questioning precisely because of its integration of knowledge and skills in a context relevant to her own teaching. This is consistent with the findings of Garet et al. (2001) who state "*the profound importance of subject-matter focus in designing high-quality professional development*" (p936) in their study of what made professional learning effective for over 1000 mathematics and science teachers. This also supports the importance of professional learning to develop Shulman's (1986, 1987) concept of pedagogical content knowledge, with its synthesis of subject content knowledge and pedagogical strategies; this form of professional learning being considered to be worthwhile by participants.

Little evidence was provided by participants of the use of assessment or evaluation data of pupil performance to guide professional learning or this feeding into any structured cycles of enquiry, however, some participants spoke about their on-going evaluation of their teaching, which presumably included pupil assessment data and other evidence, to identify areas of professional learning need. Timperley (2008, p29) states that this principle, along with maintaining momentum, is the most important of her ten. That there was so little evidence of it occurring indicates the impact of the professional learning experienced by most teachers is likely to be low, and also less likely to promote teacher agency and self-regulatory skills.

There was also little evidence of structured multiple opportunities to learn and apply information gained from professional learning, and the experience of whole-school professional learning programmes was mixed at best. It appears the manner of their introduction, implementation and leadership can significantly affect the outcomes of such programmes. Dani was receiving ongoing coaching support and Gill also described having participated in more extended book group style activities, but these were in the context of developing leadership skills rather than teaching and learning. In-service days, departmental and faculty meetings, and local authority networks all potentially provide multiple opportunities to learn and are spaced appropriately to allow for the application of learning between meetings, but again there was little or no evidence from the participants of them being used in such a manner and they did not exhibit the characteristics of effective professional learning communities as described by Stoll et al. (2006, p226). They were largely cases of "*contrived collegiality*" (Hargreaves & Dawe, 1990). The vast majority were effectively one-off events, with a significant proportion of the time given over to administrative and accountability issues rather than professional learning, consistent with

the accountability and performativity cultures described by Shapira et al. (2023). Whilst good quality, targeted one-off events have been shown to raise pupil outcomes this is only when narrow curriculum goals are targeted (Timperley et al., 2007, pxxviii) and are not likely to lead to wider system improvement or changes in the attitudes and beliefs of participants. There was some evidence of attempts to build multiple opportunities to learn and to encourage structured application of learning in some of the professional learning which might previously have been considered as just one-off events. SSERC has begun to introduce multi-part professional learning courses with 'gap tasks' to encourage participants to apply learning and experiment in their classrooms before having an opportunity to feed back and share their experiences at the final meeting of the series. Similarly, IOP had linked related events together with encouragement for participants to treat them as more than just a series of one-off events. However, these innovations do not go as far as a full cycle of enquiry, as described by Korthagen & Kessels (1999, p13), Timperley et al. (2007, pxliii), and Donohoo & Velasco (2016, p6), and are not embedded in the local working context of the teacher.

As well as most of the professional learning activities experienced by teachers being one-off and relatively transmissive in nature there was little evidence of differentiation for different teacher audiences beyond the specific support provided to early career teachers during their probationary period. Participants reported good opportunities to work with others whether that be departmental or faculty colleagues, wider school colleagues, or other local physics teachers, however, it appears that most of these collaborative activities are at the 'exchanges and co-ordination' level rather than deeper 'professional collaboration' as described by Schleicher (2020, p37). Participation in such communities of practice (Wenger, 1998), or discourse communities (Tytler et al., 2011), alone is insufficient and does not necessarily lead to the processing of new learning into changes in practice, attitudes or beliefs. Stoll et al. (2006, p224), when unpacking the term Professional Learning Community, highlight that whilst a group of teachers may form a community which acts professionally, if it is learning impoverished rather than learning rich then improvement is unlikely to occur. The lack of use of structured strategies such as enquiry cycles, lesson study or instructional coaching means that much of the collegiate working reported by participants is likely to be of lower impact than might be expected. Such strategies are likely to require some facilitation or input from knowledgeable others, but this was often limited.

Many of the participants commented on the useful input of knowledgeable subject-specific expertise from SSERC staff, IOP Scotland Physics Coaches, knowledgeable colleagues or local physics teachers. Several participants also spoke about particular teachers of other subjects in their schools from whom they had received good support, particularly early in their careers. There was little mention by participants of other knowledgeable others such as local authority or university staff. In the three schools currently implementing significant externally funded whole-school professional learning initiatives there was input from international knowledgeable others. Access to knowledgeable others in other schools appeared much more variable, and usually poor, with lower levels of support from local authority officers for example compared to what might have been available previously. Without access to knowledgeable others it may be that there is a lack of challenge to the status quo and it may be difficult for teachers to access new ideas and ongoing support which might influence their practice, or worse there might be the "*sharing of ignorance*" (Guskey 1999, p12). Timperley et al. (2007, pxxix) reported that whilst the presence of an external expert does not guarantee successful professional learning, new learning is unlikely without the support and challenge of a knowledgeable other with expertise in the appropriate topic or knowledge of how teachers learn. This is supported by the findings of Cobb et al. (2018).

Generally, there seemed to be a lack of active leadership of professional learning. Several of the more experienced participants spoke of the professional learning leadership available from local authority staff having decreased during the last decade or more. The leadership of professional learning exhibited by senior leadership teams in schools was variable at best and very poor in some cases, and several participants indicated misalignment between the professional learning they valued and what seemed to be valued and provided by school and local authority leadership, consistent with the findings of Cordingley et al. (2018, p20) where leaders valued subject-specific professional learning less than teachers. In-service day time in many schools was reported as being used poorly with little medium or long term structure, planning or follow-up, similar to the findings of Bubb and Earley (2009, p8) and these were often seen as a wasted opportunity by participants. Participants also reported feeling they had little or no voice or influence when it came to decision-making for school or local authority professional learning activities.

PRD and PU were rarely operating as intended and what was reported appeared at least as bad as the situation described by the GTCS that "*there is still a significant percentage of*

respondents whose PRD is not meeting their needs" (GTCS, 2020, p12). The responses of participants gave the impression that staff professional learning was a relatively low priority in schools and local authorities despite it being widely recognised as one of the strongest drivers of improved pupil learning (Kraft & Papay, 2014, p487; Robinson et al., 2009, p42), system improvement (Opfer & Pedder, 2010), and improved staff morale, motivation and retention (Allen & Sims, 2017).

Timperley's (2008, p24) final principle is that for sustained improvement in pupil outcomes it is required that teachers have sound theoretical knowledge, evidence-informed enquiry skills and supportive organisational conditions. The data gathered from the teacher participants showed that all three of these conditions are rarely found simultaneously. It is very clear that most of the professional learning experienced by participants fails to meet many of Timperley's ten principles for effective professional learning, particularly those related to professional enquiry and sustainability, the principles most likely to lead to both good or sustained professional growth of the individuals involved and more holistic system improvement. This is consistent with the conclusion drawn from analysis against Kennedy's model and that little of the professional learning is leading to transformative changes in practices.

6.2.5 Professional learning practices

As already described in chapter 6.2.3 there was no evidence of enquiry-based approaches as illustrated by figure 16 on p91, with teachers not undertaking individual enquiry projects, and enquiry certainly not embedded as stance (Cochran-Smith & Lytle, 1999). Fairly traditional conceptions of how professional learning takes place and impacts on practice persist and there is a generally poor understanding of the complex processes involved as discussed in chapter 3.2. Apart from Andrew, and George and Gill to some extent, there was also little evidence of the teacher participants taking ownership and leadership of their own professional learning and attempting to construct a programme of micro-events or longer activities meeting their needs (Evans, 2019). The PRD process was also failing to assist in this regard. Most were much more reliant on taking opportunities on an ad hoc basis as and when they might become available to them, which might be symptomatic of the cultures in which they work. Some, such as Ava and Calum, demonstrated considerable agency in terms of participating in a significant amount of freely available subject-specific professional

learning during evenings or weekends, and particularly in Ava's case this was then a significant source of frustration when she compared the impact of these professional learning opportunities with those organised through the formal structures within her school. As a result, some of the professional learning participated in was not necessarily aimed at addressing a pre-identified need or deficit through any formal process. Attending one-off conferences, often of a relatively transmissive lecture style, did not always include sessions addressing a need that the delegates might have identified ahead of the event. However, many participants considered such events to be worthwhile as they were confident that many of the sessions would be valuable, motivating, and give access to new and challenging information from knowledgeable others, along with there being benefit from the informal networking with colleagues between sessions. Hence, there was always an element of chance involved in attending such professional learning but on serendipitous occasions participants reported significant events that had led to potentially transformative changes in their practices similar to those reported as a result of relatively brief inputs at 'grassroots' professional learning events (Amond & McIntosh, 2016). One good example was David reporting making a very fruitful connection with another teacher working in a similar school a great distance away thanks to meeting informally at a conference and which led to subsequent virtual collaborative working. Another notable example which addressed a previously unidentified need was Ava's high praise for the professional learning delivered by the Perimeter Institute and her adoption of its teaching materials and strategies into her own and colleagues' practices despite being told explicitly by her line-manager not to implement any change from that professional learning. Such events might be unpredictable and serendipitous but without opportunities afforded by the likes of conferences or networks it is unlikely that such change could occur, something that restrictions during the COVID-19 pandemic had highlighted.

6.2.6 Summary of the professional learning experiences of teachers

Overall, the findings from the exploration and analysis of teachers' professional learning journeys paint a picture of teachers being engaged in a relatively incoherent mix of mainly transmissive professional learning activities. Teachers can, and do, exercise autonomy and agency over how and when they engage with more individual and private professional learning such as webinars, podcasts and private reading outwith their working time agreement, and no teacher indicated any concerns at not being able to satisfy the contractual

expectation of completing 35 hours of professional learning of this type per year. Participants also reported that much of this type of professional learning met a need, and certainly if this were not the case, they would be unlikely to give up their 'spare time' to participate in it. However, the formal professional learning opportunities organised by schools and local authorities appear to be mostly failing to embrace more transformative models of professional learning or to make the most of the opportunities afforded by shared collaborative time, and most participants state it does not match with their priorities. Similarly, participation in postgraduate study or professional learning based on a practitioner enquiry model, such as that available from Education Scotland (Education Scotland, 2021c), was very low suggesting it is not well known about by many teachers, not seen as matching their priorities, or may come at too great a cost.

The policy and contractual environment of teachers allocates time and sets expectations on teachers to complete professional learning but there is little in place to ensure that this leads to meaningful growth of teachers or their pupils. There were some examples of schools attempting to put more transformative programmes of professional learning in place for their staff, drawing on external expertise, and often with external funding, but the impact of these appears to be mixed at best. There is also little evidence of schools using forms of teacher study groups (Firestone et al., 2020) in a sustained, structured and coherent manner which promotes mechanisms more likely to result in teacher professional growth (Sims et al., 2021).

It would appear teachers generally do not recognise much of the informal, implicit, or incidental learning taking place in the workplace (Eraut, 2004; Smylie, 1995). There is also little evidence of teachers displaying high levels of agency in terms of constructing programmes of professional learning by combining different events and activities together to meet their needs, or creating sequences or cycles of micro-events as described by Evans (2019). Where there is some evidence of this occurring, this occurs outside the formal professional learning structures of their schools or local authorities and is not being facilitated by processes such as the PRD all Scottish teachers are expected and obliged to use. There is also evidence, especially when time is in demand, such as during the COVID-19 pandemic, that teachers prioritise the learning of their pupils over their own, consistent with the observation of Illeris (2014, p133) that the professional learning of adults in a workplace will always be secondary to the production of the goods and services of the organisation.

The data gathered from teachers, and its analysis, give a good baseline of how professional learning is enacted in practice. Leaders in the meso-level of the education system, including senior leaders in schools, have an important role both in translating national policy for a local context and setting the professional learning environment of teachers. It is to a comparison of the teachers' experiences with national policy and the views of leaders that I now turn.

6.3 Research question 3

RQ3 How well do actual teacher professional learning experiences align with policy?

This study set out to investigate the alignment of professional learning practices with stated policy positions, and by interviewing practitioners from classroom teachers through to senior system leaders, to explore why practices might not align well with policy. The findings in chapter 5 and the discussions from research questions 1 and 2 now enable research question 3 to be addressed, all informed by the policy background and wider literature discussed in chapters 2 and 3. Several themes emerged from the analysis of the data which illustrate significant disconnects between the professional learning generally experienced by teachers and both policy statements and good professional learning practices.

6.3.1 Use of in-service days and collegiate time

The time potentially available for professional learning activities during in-service days and collegiate time amounts to more than 3.0% of every teacher's contracted working time, and as staff salaries are the greatest part of school budgets this amounts to around 2.5% of the national budget for schools. Given the pressures on council budgets (Ogden et al., 2023), it should go without saying that this time and money should be used wisely and effectively to promote the professional growth of teachers, and therefore improve the outcomes of pupils and the education system.

This time provides the main opportunities for teachers to collaborate with colleagues within and between schools and for speakers or other knowledgeable others to visit schools and work with significant numbers of teachers. It is the employer's responsibility to ensure a wide range of CLPL opportunities (SNCT, 2007, para. 9.4) and this time is their main opportunity to provide the high-quality, collaborative professional learning desired by teachers as described in chapter 5.4.5 and is shown to be beneficial in chapter 3.3.1. It is

potentially a significantly greater amount of time for CLPL than the 35 hours of personal CLPL within teachers' contracts. However, teachers reported the time was not being used effectively with little CLPL which was meaningful to them occurring, especially on in-service days. This included them identifying a lack of time for subject-specific CLPL focused on improving pedagogy, consistent with Education Scotland's data (2019b, 2021d, 2022a). Leaders, especially those in schools, frequently acknowledged that different local, regional, and national priorities, and logistical restrictions compromised the effective use of this time and prevented the great variety of professional learning needs which exists in any school staff from being well met.

Many of the teacher participants had experienced whole-school or local authority-wide professional learning programmes, usually instigated by the local authority. Frequently these programmes involved a small number of staff in a school receiving professional learning to enable them to facilitate professional learning with colleagues using the potentially problematic 'cascade' model (Bett, 2016; Perry & Bevins, 2019). The attitudes towards such programmes of Gill, Dani and Andrew who had held facilitator roles were significantly more positive than other teachers who had only experienced activities cascaded to them. The more in-depth professional learning provided for facilitators appeared to give those involved a greater understanding, ownership and commitment to the programmes than for the other participants who frequently reported they had little say in participation and were not always given an adequate rationale for participation, including explicit details of how the programme would benefit them as individuals and the school community more collectively. It may have been that those chosen for facilitator roles were more likely to be positively disposed to the initiative in the first place but their experience of more extensive and sustained professional learning, which may well have met more of Timperley's principles, appeared to have a positive impact on their views of the professional learning compared to others without this experience. There appears to be a disconnect whereby leaders introducing such programmes either did not adequately determine whether the programme addressed sufficiently the needs of the staff involved, especially as different staff would be initially at different starting points, or if the needs of staff were known, took time to adequately explain how the programme could address these. From the outset, this could easily result in resistance from staff to the programme, in more or less overt forms (Priestley et al., 2015; Robinson, 2018). That such programmes frequently extend over significant periods of a year or more could be daunting, demotivating and frustrating for staff not fully

committed to the programme and who might consider the time could be more profitably used for other professional learning which they more readily understood and was likely more closely related to their context.

Although Kraft et al. (2018) argue that quality of content is more important than quantity, and my data also indicates the quality of leaderships and ownership are also important, more sustained programmes are generally a feature of impactful professional learning and necessary for effecting lasting change in practices and culture. However, if this premise is not explicitly explained to participants, the benefits of committing to a lengthy programme may not be understood. School leaders like Sam had demonstrated agency by resisting the imposition of such programmes on his school by his local authority as he had not considered these to be effective use of precious collaborative time or to meet the needs of a sufficient proportion of the staff in his school.

Although all schools had some form of self-organised programme of CLPL, utilising combinations of in-service days, collegiate time, lunchtime and twilight meetings, few teachers reported these meeting their needs well. John was the only teacher responding positively but he attributed this to the leadership shown by an enthusiastic principal teacher supported by a knowledgeable depute headteacher. The programme also largely drew on educational research and evidence from outwith Scotland rather than anything provided via the local authority, RIC or Education Scotland indicating a lack of appropriate support available from the meso-level of Scottish education. Andrew was also reasonably positive about the use of collegiate time in his school, if not in-service days, but he had a leadership role delivering some of these activities, consistent with the improved commitment from facilitators described above.

Several leaders identified tensions in schools regarding the delivery of good CLPL in the finite time available. This included the balancing of individual, school, regional and national priorities, knowledge of how to ensure CLPL matched the principles of the National Model of Professional Learning, logistical problems such as the lack of coincident in-service days in neighbouring local authorities within the RIC, and general capacity issues for facilitating collaborative working. At the time of data gathering, the party of the Scottish Government had promised an additional 90 minutes per week of non-contact time for teachers (Scottish National Party, 2021, p62), however, although several leaders would like to see its use for

collaborative CLPL activities, they considered it would be difficult to deliver this due to staffing constraints and difficulty releasing appropriate groups of staff simultaneously, both within and between schools. The difficulty funding and staffing this is perhaps also a view now shared by the Scottish Government as there has been little movement on this issue since (Hepburn, 2022a) and it has not been mentioned in its programme for government (Scottish Government, 2023).

Overall, the almost unique professional learning opportunities afforded by in-service days and collegiate time are arguably being squandered. A potential contributor to this is the manner in which teachers' contracts are specified (SNCT, 2007) which resulted in participants seeing a distinction between the mostly in-school professional learning time as specified within teachers' working time agreements and the more personal professional learning of 35 hours per year. There was a lack of consensus around the most effective ways to use collegiate time, exacerbated by excessive accountability pressures (Shapira et al., 2023), and it generally ends up being used for administrative tasks and briefing meetings rather than professional learning. As described in chapter 3.3.1, the literature on professional learning indicates there is a strong collaborative, social aspect to much effective professional learning. Whilst some leaders wished to see greater use of collegiate time for collaborative professional learning, including more subject-specific work, there was widespread acknowledgement by leaders of pressure to use this time for other activities. Some leaders wished to see some of the teachers' 35 hours being used for more directed activities which are suited to being done as an individual to free up time for collaborative professional learning during collegiate time. As all teachers are supposed to have their annual professional learning plans agreed by their line-manager as part of the PRD process this would be a relatively nuanced change but one which would likely be met with resistance from unions and local negotiating committees as it would be seen as reducing the autonomy of teachers to decide on the best use of their time. It might also be subject to school senior leaders and others in the meso-level promoting managerial conceptions of professionalism and increasing scrutiny activities. This is a tension which is at the heart of many problems within Scottish education where transformative conceptions of teacher professionalism, empowerment, and local decision-making are pitched against the need for system coherence together with managerial conceptions of professionalism promoted by prominent accountability and scrutiny processes.

6.3.2 Professional Review and Development and Professional Update

The policy position is unambiguous. To teach in Scotland one must be registered with the GTCS and "*meet and maintain the Professional Standards which are set by GTCS*" (SNCT, 2007, Appendix 2.6), and to remain registered with the GTCS it is mandatory to "*engage with the Professional Update process*" and to "*commit to lifelong learning, through an ongoing process of professional review and development"* (GTCS, 2021b). It became clear during the interviews with teachers and with many leaders, especially those in schools, there was a poor understanding of the roles and responsibilities for both individuals and organisations with respect to Professional Review and Development (PRD) and Professional Update (PU). This parallels Khadija Mohammed, GTCS Council Convener, writing in the GTCS's journal describing a common misconception regarding the role of GTCS amongst teachers.

> "*I thought GTC Scotland was there to ensure I was on track with professional development and to "police" teachers. When I moved into academia, I understood GTC Scotland's role as one of registration and regulation … I wish I had known that earlier*." (Mohammed and Macmillan, 2022, p33)

Many participants, often alongside statements of frustration or of feeling undervalued, referred to never receiving any feedback from the GTCS on their submissions for PRD and PU illustrating they did not understand that the role of GTCS is to validate the PRD and PU processes of local authorities, and it is then the role of staff in local authorities to implement these processes, including providing feedback. Several teachers referred to receiving little or no feedback from their line-manager; coaching conversations had generally not occurred.

The need for effective coaching conversations during PRD meetings is central to policy (GTCS, 2019, p9) and was stressed by several leaders, however, some identified a lack of training for this, even at headteacher level. Some identified that whilst headteachers may have been coached, including as part of the masters-level headship qualifications, the experience of being coached does not necessarily prepare one to be a coach without more explicit training. Dani's experience of being coached as a middle leader exemplified this. It was only when probed during his initial interview for this study about his experiences as a coachee did he appear to begin to consciously consider how he might draw on these experiences by using coaching techniques with staff in his faculty, something he reported doing a year later. Fiona also spoke about a programme to build coaching capacity in staff across the Northern

Alliance, but this had been stymied by the COVID-19 pandemic. Nevertheless, this would only have involved a very small percentage of the staff conducting PRD interviews. That line-managers did not necessarily have good knowledge of the CLPL opportunities available and were placed poorly to advise reviewees was also frequently identified as a weakness in the process. This is likely to contribute to why the PRD process is not generally being used by teachers to plan and compile sequences of micro-events into meaningful programmes of professional learning.

Despite policy guidance promoting a transformative conception of professionalism (GTCS, 2019) and desire by leaders to see PRD enacted well and to be connected with school improvement planning, this was not the experience of many teachers. A consensus and clarity around the purpose of PRD appeared missing in its enactment, further complicated by the tension between the 'bottom-up', individual and transformative professionalism of PRD guidance and the 'top-down', systemic and more managerial conception of professionalism generally promoted through improvement planning processes. For many teachers there was an almost complete disconnect between school improvement planning and PRD. The demands of the professional learning recording process emphasised the impression of scrutiny, accountability and a managerial conception of professionalism, even if records were possibly never looked at by anyone. A culture of compliance where professional learning and its recording was seen to be 'ticked off' was being promoted with little benefit for anyone (Groundwater-Smith & Mockler, 2010, p57). The recording process was frequently described as 'clunky', promoting a 'tick-box' culture, resulting in unnecessary bureaucracy with little or no apparent gain in professional growth, and used time which could otherwise be spent on improving teaching and learning for pupils. This is exacerbated by Scottish teachers having relatively little non-contact time for things such as PRD (OECD, 2022), and the PRD process and professional learning more generally being pushed down priorities when time is limited. Despite it happening rarely, reviewees should be seeking feedback from their reviewer, usually their line-manager, preferably as part of an open and trusting coaching conversation. This is set out in the GTCS guidance on Roles and Responsibilities, and Myths and Legends about PRD (GTCS, n.d.-d). However, a lack of awareness of the content, or use of, such policy documents was widespread and is discussed next.

6.3.3 When everything is a priority, nothing is a priority

There was a clear lack of awareness and interest in national policy documents from the teacher participants. The most striking example of this was a complete lack of awareness of the National Model of Professional Learning which at least half of the leaders considered to be an important document for teachers to be using. On the whole teachers wished to focus on their teaching and either did not see national policy documents as directly relevant to this, or being time poor, did not prioritise reading such documents sufficiently to allow for meaningful engagement. There was also evidence that teachers had a narrow conception of what a policy document is, and some did not even consider documents such as the GTCS professional standards to be policy. This may be a result of the interpretation process, as described by Emma, where macro-level policy becomes invisible at the micro-level and just becomes things for teachers to do. There was also a lack of awareness of policy as a discourse rather than a thing (Adams, 2016; Ball et al., 2012), although the focus in the interviews on the use of policy documents is likely to have influenced the way both leaders and teachers referred to policy.

That teachers did not engage with policy documents may be because many teachers associate policy more with accountability and scrutiny rather than with supporting teaching and learning, along with the overload of competing policy initiatives resulting in teachers effectively ignoring them to focus on their main priority and that which they can control, the teaching in their classroom. Despite the National Improvement Framework (Scottish Government, 2021a) being designed to set policy priorities, both the OECD (2021, p99) and Muir (2022, p76) identified an overly complex policy landscape in Scottish education and that attempting to manage these competing demands "*drain the energy and capacity of teachers and school leaders*" (OECD, 2021, p99). Together with the high class-contact time of Scottish teachers (OECD, 2022, p351) this provides a poor national context for engagement with policy and for the provision of, and participation in, coherent high-quality programmes of professional learning.

Likely exacerbated by the lack of time to properly engage with national policy, practitioners look to those immediately above them in the still strongly hierarchical structures in Scottish education to interpret policy and provide guidance and support. Hartley (1986) described, several decades previously, communication only between contiguous layers in the hierarchy

and this appears to largely remain, such as when Bruce stated that frequently people look to those in the level above in the management hierarchy to interpret and filter policy into a form relevant for their context. School leaders, as was also reported by the OECD (2021, p98), saw part of their role as interpreting policy and protecting their staff from policy incoherence and overload. However, there was widespread concern about the capacity of the organisations in the meso-level to interpret and filter policy, and where this occurs it might reinforce hegemonic relations and not best meet the needs of teachers.

All teacher participants looked to the school improvement plan for direction, some commenting that they expected and assumed it to reflect national priorities and the content of documents such as the National Improvement Framework. However, they reported frequently they had little or no voice in the shaping of their school improvement plan, often because there was inadequate time to engage properly, and they also reported that pedagogical professional learning and improving teaching and learning for the young people in their care was not included adequately in these plans. There appears to be a difference in values, and therefore in priorities, between many teachers and many in school senior leadership and elsewhere in the meso-level. It would be dangerous to think that if teachers have had an opportunity to input into policymaking, no matter how limited, but have not contributed that they are then content with either the process or the product. Some teachers may not consider it worth spending time on such consultations if they do not think their views will be valued or taken on board.

Poor engagement with school improvement planning processes may explain why many participants, both teachers and leaders, saw a tension between external policy and professionalism expectations and the professionalism of individual teachers. That PRD is focused on the individual and potentially very separate from school improvement planning is longstanding (Marker, 1999, p922; OECD, 2022, p391) and is an example of the contradictions that permeate Scottish education, such as when curriculum policy documentation promotes increased teacher autonomy over local curriculum-making but this sits within centralised and hegemonic national policymaking, accountability and governance structures, as illustrated by Bruce's description of inflexibility by SQA. Some leaders spoke about situations, where through good leadership, some school leaders were able to help bridge potential barriers and ensure teachers' professional learning needs were well integrated into whole-school planning. However, from the responses of the teachers

interviewed, sympathetic and effective leadership of this type was rare. The 'bottom-up' PRD process for individual teachers and the 'top-down' national and school improvement planning processes, as reported in chapter 6.3.2, were seen to exacerbate this divide for many teachers. There have been recent calls for a greater teacher voice in national policymaking (Muir, 2022). If this were the case perhaps 'top-down' national priorities might better match 'bottom-up' teacher priorities.

Better alignment already happens to some extent in some schools, such as evidenced by the difference in professional learning behaviours between teachers in subgroups 1 and 2, see appendix 14. A more systemic focus on professional learning on improving classroom practices and teachers developing their pedagogical content knowledge would likely close the gap between whole-school and individual teacher priorities. There was a general feeling throughout all interviews conducted of the need to focus on fewer priorities and use more of the scarce time available on activities more closely related to improving teaching and learning. Fewer competing priorities would also give better opportunities to embed and evaluate change rather than the widely reported experience of moving on to the next initiative before the benefits of the previous initiative were realised. Teachers in this study experienced tension, and resulting frustration, when they did not see the external policy, or the way it was being enacted, as being consistent with their ability and desire to provide the best possible teaching and learning experience for the young people in their care. In terms of their professional learning, this manifested in the strong desire of teachers for more subject-specific professional learning but this being almost completely absent from the provision from schools, local authorities, RICs and Education Scotland which was seen by teachers to be dominated by policy initiatives or managerial issues distant from what mattered to their classroom practice. How such tension is negotiated depends on the quality of leadership for professional learning, the culture this promotes, and the empowerment and agency of participants, and I now turn to these.

6.3.4 Empowerment, agency, and leadership of professional learning

From the interviews, it was evident there was general support from the participants in this study for the concepts of teacher agency and empowerment of all education practitioners, not just in terms of professional learning but more generally, however, much of the policy in Scottish education around empowerment was seen as rhetorical rather than being effective

in practice. As Ken observed, much of the policy around empowerment relates to the system, schools and headteachers rather than in relation to individual teachers echoing the recommendation of the OECD that there should be "*less emphasis on "running" CfE as implementation and consensus-building at the system level towards professional leadership focused directly on the nature of teaching, learning and the curriculum in schools, networks and communities.*" (OECD, 2015, p21). It was clear that being empowered meant different things to different individuals and some could feel empowered in some aspects of their work but completely disempowered in others, a factor of where both political and financial power resides, and the leadership culture in schools. Scottish education is recognised as being highly centralised, despite attempts to devolve power (Donaldson, 2014; Humes, 2020, 2021; McIlroy, 2018), often with personnel reaching senior positions through conformism and then moving between national organisations thus reinforcing the hegemony of the leadership class (Bhattacharya, 2021; OECD, 2021). The teachers in this study felt remote from macro-level decision-making.

Dani described a culture of compliance within Scottish education and there is evidence of a lack of willingness of staff to speak out about even the most serious issues (McLennan, 2022), in part due to employment contracts which constrain free speech (Commission on School Reform, 2022). Against this backdrop many teacher participants displayed considerable agency with respect to their individual professional learning over which they had significant ownership but only occasionally in terms of that organised by schools, local authorities, RICs or national agencies where they generally considered themselves to have little influence and to be disempowered, even although some leaders described efforts to ensure teachers were better engaged in such activities. Apart from during their self-organised professional learning, there was little evidence of 'activist teachers' (Sachs, 2003b) other than through resistance (Ball et al., 2012), sometimes through effectively ignoring or playing lip-service to initiatives and focusing their efforts on their local priorities in the classroom.

The importance of having a good culture, and the difficulty in achieving this, was recognised by all leaders, but from the teacher interviews the leadership culture in schools appeared to be highly variable. Different cultures inevitably impacted on the ability of the teacher participants to exhibit agency (Priestley et al., 2015). Several leaders questioned how highly the leadership of professional learning featured in the preparation available to aspiring and existing headteachers, and the capacity of the system to develop and support an

understanding of teacher learning and coaching strategies in school and system leaders. In comments similar to those made about a lack of capacity in the system to support staff with the skills to lead good coaching conversations during PRD, concerns were expressed about the capacity to support teachers use enquiry approaches in their professional learning. Whilst many school leaders may experience enquiry approaches during masters-level headship courses, further support is likely needed for them to facilitate the enquiries of others. This is likely to contribute significantly to why so few of the teacher participants were using enquiry as part of their professional learning. More explicit training/education in facilitating enquiry approaches in professional learning appears to be needed.

A further factor affecting the leadership of professional learning, which perhaps explains why many in-service days are used poorly with a lack of transformative collaborative enquiry occurring, is the lack of prior experience of this for many in school and system leadership roles. If teachers are to benefit from improved professional learning experiences, it is important that professional learning in how to better organise and facilitate it is provided for those in system leadership roles, and senior and middle leadership roles in schools. Part of this is about relinquishing control, to avoid the tendency to micromanage, and to trust that teachers will use their professional learning time on activities beneficial to improving their teaching, something several leaders acknowledged was hard to do. If good coaching conversations are occurring during PRD, if there is good use of collegiate time in schools, if all teachers have a genuine opportunity to input to school improvement planning processes and to have a feeling of influence on these even if decision do not go their way, and some ownership in the results, there is likely to be a good professional learning culture and a very high likelihood that professional learning time will be used very effectively. If teachers have more ownership of their professional learning time, they are likely to use a greater proportion for subject-specific professional learning, including collaborating with peers.

6.3.5 Subject-specific professional learning

The desire for more subject-specific professional learning was strong in teacher interviews and for a few of the leaders interviewed. This resonates with other research in the area (Education Scotland, 2021d, 2022a; Farmer & Childs, 2022). Teachers saw the need for well organised and facilitated local authority or RIC subject networks to allow between school collaboration. The need for teachers to develop good curriculum, subject, and pedagogical

content knowledge early in their careers and maintain this throughout their careers, even when they might develop interests in other aspects of education, also came through strongly in most leader interviews, especially for those with more senior roles. The meso-level was considered to not have the necessary capacity to support subject-specific professional learning, in terms of people as well as other resources. Many hoped that the new lead teacher posts (SNCT, 2021) could fill this gap.

The policy documents analysed say very little about the content of professional learning, however, in How Good Is Our School? (Education Scotland, 2015), which steers the focus of evaluation and inspection and therefore the accountability pressures which permeate through the system, 'Curriculum' and 'Learning, teaching and assessment' are only two of its fifteen sections compared to many on leadership and management issues. Several leaders, using the hindsight of experience, but also referring to the recently published review of CfE (OECD, 2021), commented that many of the problems identified stemmed from CfE documentation having not placed sufficient emphasis on subject-specific knowledge and pedagogy and that teachers had not been supported with adequate professional learning and teaching resources for effective curriculum development and implementation. Teachers very much agreed and also described a lack of capacity in the meso-level to provide the support desired and needed. Owing to this many teachers described turning to subject associations, social media, and other sources outwith the 'system' for most of their subject specific support. This resulted in very ad hoc provision.

It appears that for the introduction of CfE that "*curriculum development rests on teacher development*" (Stenhouse, 1975) had been forgotten at a system level but this may be beginning to be recognised once more, particularly by the senior system leaders interviewed. James referred to teachers needing a 'bag of tools' as a starting point to allow them to focus on improving the teaching and learning of young people. This is similar to Bryk et al.'s (2010, p50) 'set of tools' for teachers within their instructional guidance essential support for school improvement. However, all participants saw this as missing or incomplete, especially compared to the comprehensive suite of subject support described by Cobb et al. (2018). This suite includes conferences to give access to subject experts and to challenge the status quo, instructional coaching from subject experts, between school subject networks, collegiate time facilitated by subject coaches, expertly written instructional materials and interventions for struggling pupils. The Wellcome CPD Challenge has also shown that

supporting teachers increase the proportion of subject-specific professional learning resulted in improvements in all measures (Leonardi et al., 2022, p3), including an increase in 'research enquiry projects' by teachers and it is to this topic I turn next.

6.3.6 Enquiry

Collaborative enquiry-based professional learning can take many forms (Kennedy, 2014, p693) but practitioner enquiry is central to the GTCS Standard for CLPL (GTCS, 2021a) and appears in the inner ring of the National Model of Professional Learning where it also states there is "*an ethical prerogative to taking an enquiry stance*" (Education Scotland, 2019a). As described in chapter 3.2, it is not appropriate for all professional learning to be enquiry-based, but despite its prominent promotion, for there to be no evidence of any of the teacher participants undertaking, or being supported to undertake, practitioner enquiries or adopting enquiry as stance (Cochran-Smith & Lytle, 1999), suggests a serious policy-practice misalignment.

Many teachers were evaluating their practice and the outcomes of pupils, identifying areas for improvement, and working to address these, including by seeking appropriate professional learning, but none were using formal cycles of enquiry to do this or recognised any of their current activities as enquiry. Recent entrants to teaching may be more familiar with enquiry from their initial teacher education and use of the revised GTCS professional standards, but this was not the case for the experienced teachers studied, and there is a danger that new teachers entering schools without a culture of enquiry may quickly be socialised into their surroundings and abandon enquiry approaches. There was a little evidence of attempts to use formal strategies, such as versions of what might be called lesson study, but according to the teacher participants involved, none of these appeared to have been implemented very successfully.

Collaborative practitioner/professional enquiry approaches are likely to root teachers' professional learning in improving their classroom practices and could therefore include the significant subject-specific element desired by many teachers and allow them to better tailor professional learning to their needs. However, to conduct collaborative enquiries teachers, need:

- Time to collaborate with appropriate colleagues.

- Time to self-evaluate to identify areas to be addressed before designing, experimenting, reflecting upon and evaluating interventions.
- Access to research literature, appropriate data, and knowledgeable others.
- Access to a suitable range of micro-level professional learning events to flexibly address identified needs, such as reading, video, live online events, in-person workshops and conferences, networks, or knowledgeable others such as instructional coaches, and more extensive formal programmes where required.
- Time and opportunities to share findings with a wider audience to ensure more systemic benefit (Gilchrist, 2018; Groundwater-Smith & Mockler, 2010).

Unfortunately, the current culture in many schools, despite the wishes and efforts of many of the leader participants, does not appear to support this.

There could be significant benefits to individual teachers, pupil outcomes and system outcomes if the additional 90 minutes of non-contact time announced by the Scottish National Party (Hepburn, 2022a; Scottish Government, 2022c, 2022d; Scottish National Party, 2021) together with input from appropriate lead teachers in schools and meso-level (Hepburn, 2022b; Scottish Government, 2019f; SNCT, 2021) were used to support more effective collaborative enquiry aimed at building teachers' pedagogical content knowledge. If enquiries are rooted in the priorities of the teachers and in improving the outcomes of their pupils, then it would also likely promote the collaborative, sustained, and subject-specific professional learning focused on improving pedagogy desired by the teachers interviewed. However, teachers do not seem to understand this, to have sufficient support from school leadership and the wider meso-level to do this, or sufficient courage and confidence to use their voice to significantly influence decision-making; similar to teachers working in a system promoting compliance as described by Groundwater-Smith and Mockler (2010). Groundwater-Smith and Mockler advocate enquiry-based professional learning as a means to give teachers a voice. Unfortunately, it appears few teachers are being given good opportunities to develop that voice and to exhibit the transformative professionalism and agency to then feel genuinely empowered in their work.

6.3.7 Teacher voice

Teachers are education's greatest asset, but it is clear from both the literature and the data collected from participants that teachers' voices are not being heard sufficiently in education

policymaking, certainly at national level but also even at school level where a lack of opportunity and time prevent many from engaging fully with school improvement planning processes. A stronger teacher voice, drawing on their experiences in the classroom and knowledge of the learner voice, is required in policymaking at macro-level, meso-level and micro-level if policy-practice misalignment is to be addressed. Without this, many teachers will continue to experience frustration and to demonstrate agency mostly through the "*micro-practice of resistance*" (Ball et al., 2012, p63) and through engagement in professional learning activities outwith those available formally within the education system. If enquiry-based professional learning were better supported in schools this would build teachers' confidence and give them the tools to use their voice and to communicate their knowledge, experiences and learning within their immediate community and more widely, to the 'village' and the 'world' as described by Groundwater-Smith and Mockler (2010). Such a situation will enable teachers to better demonstrate the transformative professionalism promulgated in much of the Scottish professional learning policy guidance and which has been shown to be impactful on pupil outcomes. This then raises the question of how enquiry approaches might be integrated into a more balanced professional learning provision.

6.3.8 Pathways of professional learning

When discussing the 'optimal mix' of professional learning, Guskey (1995) stated: "*There is no 'one right answer' or 'one best way.' Rather, there are a multitude of ways, all adapted to the complex and dynamic characteristics of specific contexts.*" (p126). This view was shared by all participants; however, they also shared the view that the provision of professional learning currently available to many teachers is not suitable for their needs and contexts. It was widely acknowledged that there was a reasonable provision of different forms of formal leadership professional learning and whilst not wishing to see this diminished there was also a need to enhance formal professional learning opportunities for classroom teachers. The privileged position of leadership professional learning is perhaps because those in positions of power in the system have themselves followed leadership pathways, gained personal benefit from such professional learning, and thus project this on others who place greater priority on pedagogical professional learning. However, effective school leadership has also been shown to be a significant driver for school improvement, which includes improving the professional learning and capacity of teachers (Bryk et al., 2010, p197), but this likely requires

a greater focus on supporting school leaders more effectively lead the learning of the adults in their school.

Many teachers spoke about the need to collaborate with and learn from colleagues, including through formal subject network arrangements. Some spoke passionately about the benefits of more informal professional learning, but that this was generally under-recognised and undervalued as described by Eraut (2012) and Evans (2019). All teachers sought more subject-specific professional learning. Several leaders acknowledged, as also reported by the OECD (2021, p13), that CfE curriculum developments had diminished the role of knowledge, and that the importance of subjects and therefore of subject-specific professional learning, together with the capacity to provide this, had been lost from meso-level organisations. In their 8-year study of improving mathematics teaching, Cobb et al. (2018) identified components of a coherent and effective programme:

- Professional learning:
    - Conferences and stimulus events giving access to knowledgeable others,
    - Instructional coaching by subject pedagogical experts,
    - In-school collaborative time facilitated by subject pedagogical experts,
    - Teacher networks to facilitate between school collaboration.
- Instructional materials and assessments developed by groups of curriculum and pedagogical experts.
- Supplementary supports for currently struggling students.

This encompasses the sorts of supports identified by teachers when describing ideal professional learning provision and what was described by a leader as providing teachers with the ‘bag of tools’ to do the job, and is consistent with the reports of Muir (2022) and Campbell and Harris (2023, pp51-2). Such a programme is likely to be at the transformative end of Kennedy’s spectrum, include most, if not all, of Timperley’s ten principles for effective professional learning, and could facilitate cycles of practitioner enquiry helping embed enquiry as stance. A programme of this type may be most impactful during times of significant curriculum development, however, due to staff turnover, and the need to ensure sustained improvement as described by the OECD (2011, p74), it could nevertheless play an important part of the ongoing core professional learning available to teachers.

Some teachers and leaders spoke about the need for flexible professional learning pathways, or loops, which allowed participants to access professional learning on different topics to address particular needs, allow teachers to develop expertise in particular specialisms, and which might be suitable for teacher at different career stages. For example, these could include professional learning on pedagogical content knowledge of particular subject topics, on more generic pedagogy such as diagnostic assessment, on more general topics such as digital skills or specific additional support needs, or on leadership. To enable teachers to transfer learning as readily as possible into classroom practice, having professional learning as closely linked to their subject and context as possible was seen as important by teachers, which is consistent with at least 50% of professional learning being subject-specific (Institute of Physics, 2020b; Leonardi et al., 2022). These different professional learning pathways might also be combined into larger programmes, including masters-level pathways which might prove more attractive to many teachers than those available currently. Whilst such programmes might be seen to provide coherent programmes there is a danger that these could be a 'top-down' solution 'done to' teachers in the manner of whole-school programmes many teachers had already experienced. To provide these pathways, a menu of professional learning activities would have to be readily and flexibly available and responsive to teachers' needs. Teachers could exhibit agency in putting together a combination of micro-events and more substantial activities to meet their requirements. The increased familiarity and use of online, blended and hybrid delivery, following the COVID-19 pandemic, could facilitate this flexibility and help provide good equity of access.

The different approach to professional learning exhibited by the teachers in Subgroup 1 compared to Subgroup 2, see appendix 14, was largely due to them having readily available professional learning pathways which both matched, but also helped to shape, their professional learning needs. These had a significant emphasis on developing teachers' pedagogical content knowledge (Shulman, 1986, 1987) or foundation, transformation and connection knowledge (Rowland, 2013), important aspects of a teacher's knowledge-base as illustrated in figure 16 on p91. It was also clear that teachers in Subgroup 1 had had a greater say and involvement in some of their in-school professional learning activities and this had had a positive impact on their assessment of its effectiveness. Subgroup 2's negative views of in-school professional learning tended to be due to professional learning being too distant from their classroom context, it being cascaded to them in too little time by those who had benefited from richer experiences but had not necessarily been provided with the support

necessary to cascade professional learning to colleagues, there being little or no follow-up, it being made available at the wrong point in a school or curriculum's annual cycle, and there being a culture of professional learning being a mandated, 'top-down' experience.

The widely varying experiences of teachers and some leaders of 'bought-in' whole-school professional learning programmes illustrates that the success or failure of such programmes perhaps depends, within reason, less on the specific content and format of the programme but more on ensuring that the rationale for the programme is well explained, understood and agreed by participants. It is important that programmes address improvement areas close to teachers' classroom practices, and are sufficiently flexible to allow teachers to tailor them to their needs together with time for enactment, experimentation and reflection as described by Clarke and Hollingsworth (2002). For initiatives to have long-term impact and become embedded as habit, it is necessary to provide time for practice and follow-up before new initiatives are introduced. A culture where enquiry as stance is the norm is more likely to provide the conditions where this is possible.

Chapters 5 and 6 have set out and discussed the findings of this study with some common themes emerging across all three data sources. The final chapter draws these together before making some recommendations for improving teacher professional learning in Scotland.

Chapter 7 Conclusions and implications

In this chapter I give an overview of the main themes which have emerged from the study before making recommendations and reflecting on the study as a whole.

7.1 Conclusions

Policy-practice misalignment

The data from all three sources now allows me to give an answer for research question 3, '*How well do actual teacher professional learning experiences align with policy?*' which is arguably at the core of this study. The comparison of data from the three sources illustrates significant misalignment. In many ways the transformative professionalism promoted at the macro-level through policies like the GTCS professional standards (GTCS, 2021a, 2021b), the National Model of Professional Learning (Education Scotland, 2019a), aspects of Curriculum for Excellence and the empowerment agenda, matches well with the desires of the teacher participants to focus on and improve their classroom practices, the quality of instruction, and the outcomes of their pupils. However, much in the meso-level pulls in different directions and neither supports well the macro-level aims for transformative system change nor teachers' desire for improvements in the instructional core in the micro-level. This is largely because scrutiny and accountability pressures, even if perceived rather than real, and managerial conceptions of professionalism dominate the meso-level through the influence of policies like the self-evaluation and inspection framework How Good Is Our School? together with the 'box-ticking' implementation of the National Improvement Framework, Professional Review and Development (PRD) and Professional Update (PU). The way many in the meso-level readily adopted the more managerial McCormac recommendations whilst simultaneously failing to implement the more transformative Donaldson recommendations in the 2010s, as discussed in chapter 2.3, is a good example of the conservativism and inertia to truly enact transformative change in the meso-level despite the rhetorical language in which much policy is couched. The mixed messages about teacher professionalism in national policy guidance mean that it is easy for this to be interpreted and implemented in different ways by different actors in the meso-level, and by teachers in the micro-level, thus allowing managerial rather than transformative conceptions of professionalism to dominate implementation of macro-level policy into practice.

Despite the aim of the National Improvement Framework to provide focus and coherence, see chapters 2.3.2 and 5.1.4, there are too many simultaneous policy initiatives (Muir, 2022, p76; OECD, 2021, p99). Practitioners are time poor (OECD, 2021, p125) which likely results in an unhelpful element of randomness in the policies being addressed at any given time in any particular setting thus reducing system coherence. Policy misalignment within schools is also likely compounded by the frequently reported disconnect between the operation of school improvement planning and PRD processes. This has the effect of reducing the voice of teachers resulting in influences being dominant in the direction towards classrooms and teachers rather than from teachers to the wider system, represented by the larger size of the arrows towards the micro-level compared to those away from it in figure 19.

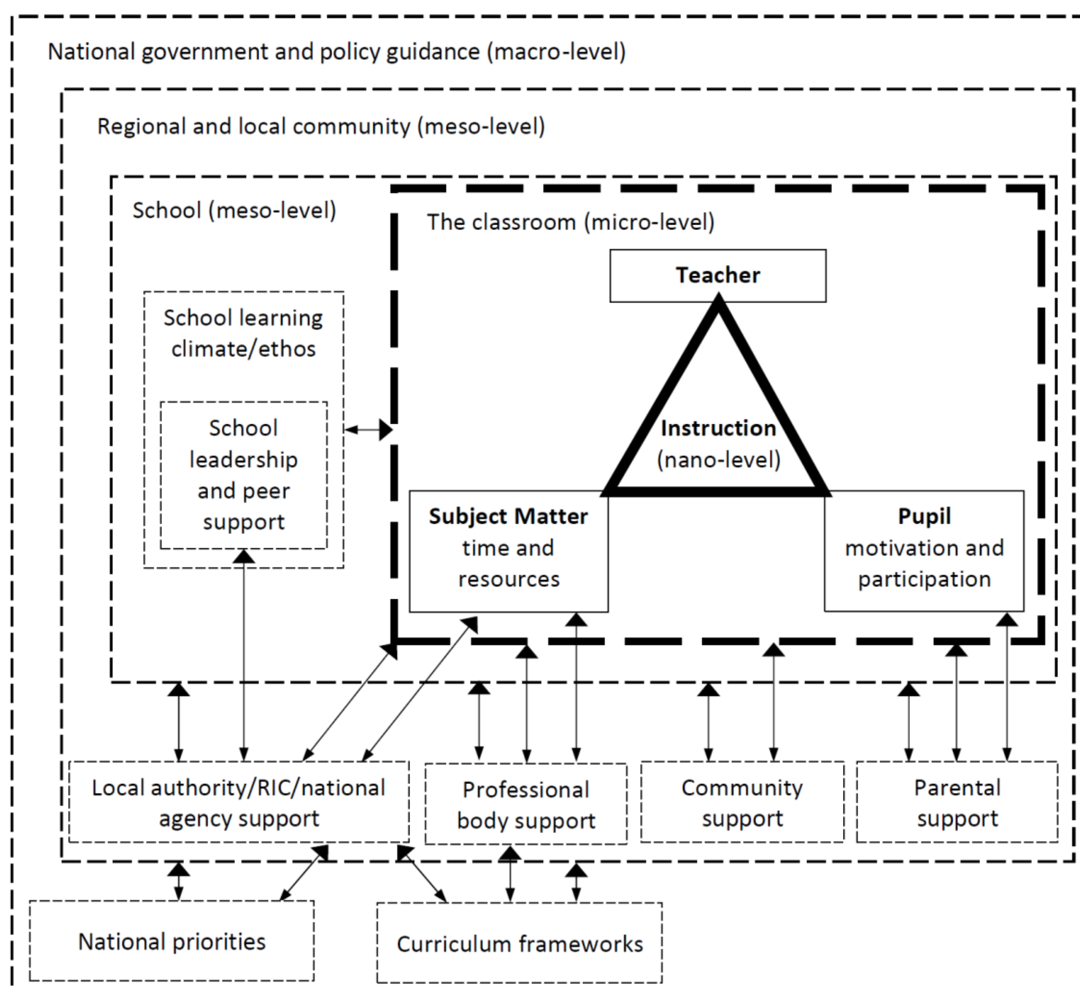


Figure 19: A model showing the influences on the instructional core in the micro-level of the education system, adapted from Bryk et al. (2010, pp 48-51)

Too often in Scottish education there appears to be a tension between a drive towards autonomy and local decision-making and the quest for overall system coherence. High performing education systems appear to be able to avoid such tensions and to demonstrate good alignment of policy and practice with the macro-level and meso-level supporting effective practice in the micro-level of the classroom and the nano-level of the instructional core (Crehan, 2016; Oates, 2017; Schmidt & Prawat, 2006). The data from the teachers and leaders in this study indicate that there is insufficient focus on improving the support from the meso-level to the micro-level and the nano-level instructional or pedagogical core and which, in the views of many, should be the main focus of the education system.

It's about instruction, stupid!

In their account of improving an education system, Bryk et al. (2010) adapted a phrase from Bill Clinton's presidential bid and state "*it's about instruction, stupid*" (p46) to emphasise that without a focus on improving the day-to-day teaching and learning practices of teachers neither the learning outcomes of individual pupils nor the performance of the education system are likely to improve. The influences on teachers and their working context are complex, however, at the core is the instruction of learners through an interplay between the teacher, pupils and subject matter being taught and hopefully learned, as shown in figure 19. Unfortunately the current situation in Scottish education means that initiative overload (Muir, 2022, p76), excessive accountability and performativity pressures (Shapira et al., 2023, p42), compliance cultures (Bhattacharya, 2021), and mixed messages and expectations about teacher professionalism distract from such a focus despite the best intentions displayed by all participants in this study. The need for more professional learning to be focused more directly on improving pedagogy was a strong theme common to all teachers and many leaders interviewed. Teacher participants stated a strong desire for more subject-specific professional learning and reported that on average 46% of their professional learning is already subject-specific. This supports the calls from some quarters for a greater emphasis on subject-specific professional learning which is closely related to the working context of teachers (Institute of Physics, 2020b; Leonardi et al., 2022).

Leadership and ownership of professional learning

The first two of Timperley's principles for effective professional learning, see table 1 on p46, are that it should be focused on valued student outcomes and have worthwhile content. Both featured highly in the views of teachers in this study when discussing worthwhile professional learning and overlap with their desire for greater subject-specific professional learning discussed above. Despite these two principles featuring in the design of common whole-school professional learning programmes, the extremely different reactions of teachers to these, together with the views expressed by some of the leaders interviewed, show their success may be less about their specific content and mode of delivery but more about how such programmes are led and facilitated, including whether they are 'imposed', how they are introduced to participants, and how much ownership and voice participants have in their direction. This is likely to apply to some extent to all modes of professional learning. For sustained, transformative professional learning to become normalised it is essential those leading professional learning recognise their role as teacher educators and have the knowledge and skills to ensure there are supportive professional learning environments and cultures (Kraft & Papay, 2014). This requires training/education for leaders of professional learning, including in collaborative enquiry and coaching approaches.

Balance of professional learning modes

To meet the diverse professional learning needs of teachers, as well as delivering on wider policy asks across the system through transformative change, a balance of professional learning from transmissive to transformative as described by Kennedy (2014) is likely required, with the modes used tailored to the purpose of the professional learning. However, the data gathered from the teachers in this study demonstrates the almost complete absence of transformative modes of professional learning as illustrated in figure 20, or any evidence of enquiry as stance as described by Cochran-Smith and Lytle (1999).

Such a stark imbalance is consistent with the policy-practice misalignment discussed above, but also a lack of capacity of the meso-level to support, facilitate and influence professional learning appropriately. Rather than being a facilitator, the meso-level, with its frequent promotion of managerial conceptions of professionalism, can actually become a barrier to the realisation of effective professional learning.

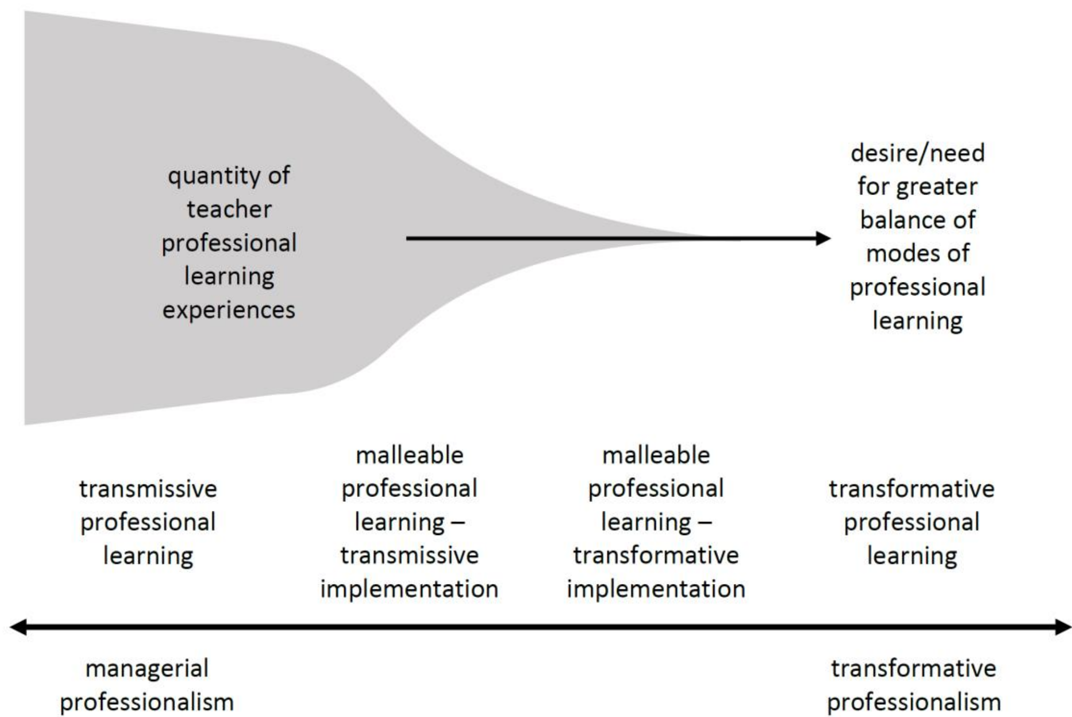


Figure 20: Comparison of teacher professional learning experiences with modes of professional learning and conceptions of professionalism

Meso-level capacity and drivers

The limited capacity in the meso-level to support the range of professional learning activities desired by teachers, especially subject-specific professional learning, was mentioned by many participants in the study. This is likely compounded by various drivers, including scrutiny and accountability functions, absorbing available time and energy which might otherwise be used for more productive endeavours (OECD, 2021, p99), such as improved support for the instructional core in the micro-level and nano-level in schools as illustrated in figure 19.

Learning from the participants and literature, figure 21 illustrates how various drivers in the meso-level tend to promote either more managerial or transformative conceptions of professionalism. Due to the predominance to those driving to the left, and a lack of those driving to the right, the meso-level tends currently to act as a barrier to teachers experiencing a balance of professional learning. The influence of the How Good Is Our School? inspection

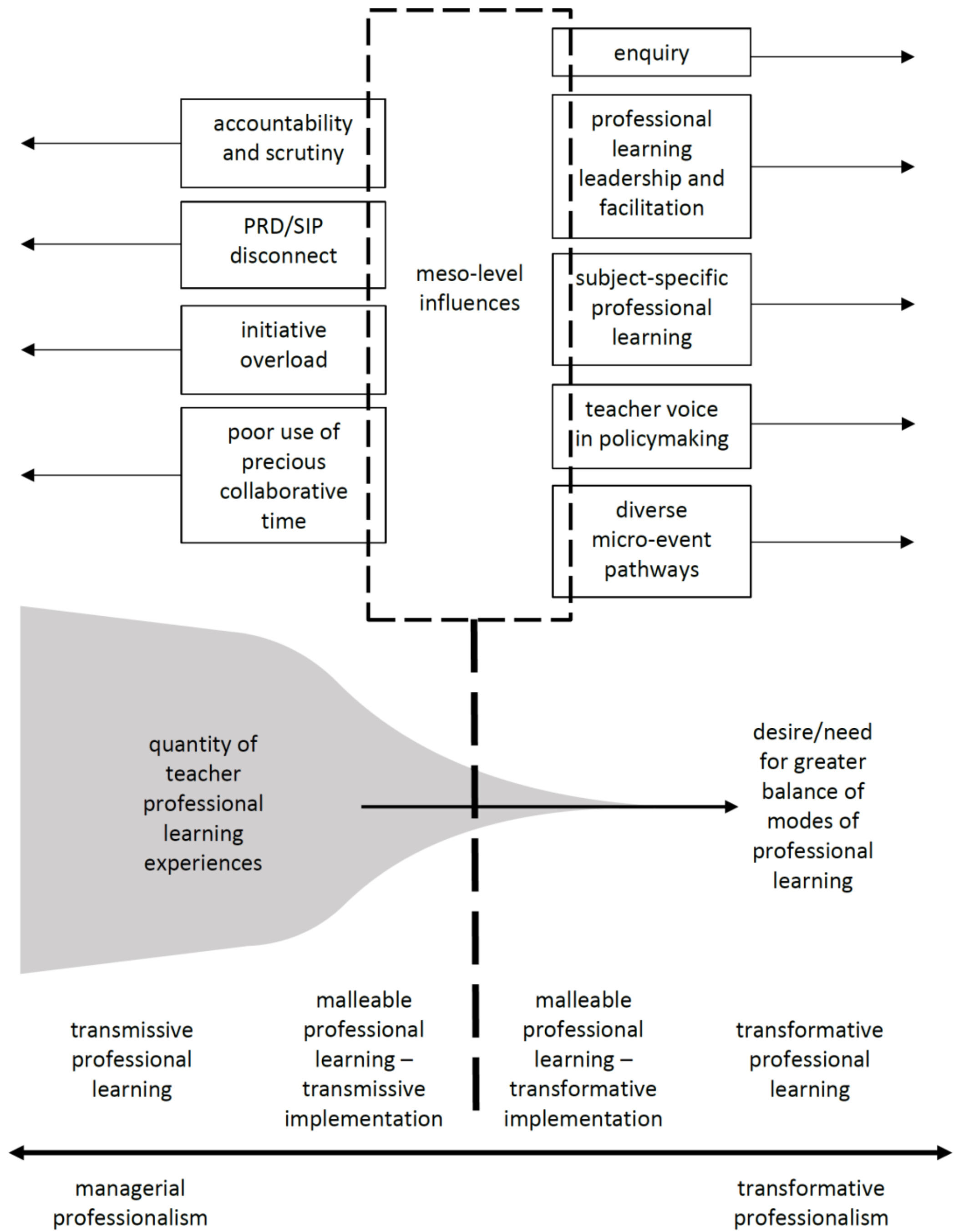


Figure 21: How drivers in the meso-level influence professionalism and professional learning

framework (Education Scotland, 2015), the frequently reported disconnect between school improvement planning and PRD, itself often implemented in a managerial manner, the manner of the implementation of the National Improvement Framework as analysed in chapter 5.1.4, and the widely reported poor use of in-service days and collegiate time, all results in a strong bias towards managerial conceptions of professionalism and the provision

of transmissive professional learning. Transmissive modes of professional learning are of course not necessarily a bad thing, and are appropriate for some purposes, however, their dominance compared to more transformative modes is unlikely to result in transformative change in either teachers' practices or the performance of the education system. This raises the question of how to encourage drivers which might result in more of the collaborative professional enquiry modes of professional learning that Kennedy identified as the most transformative, see figure 6 on p44.

Embedding collaborative professional enquiry as stance

Although teachers in the study did not report undertaking collaborative professional enquiry, see chapter 6.3.6, its use is promoted strongly in national policy such as the GTCS professional standards (GTCS, 2021a, 2021b) and National Model of Professional Learning (Education Scotland, 2019a) and by many of the leaders interviewed, particularly those in more senior positions. Embedding enquiry as stance is also likely to facilitate those other drivers directed to the right in figure 21 such as increasing teacher voice in policymaking, improving the leadership and facilitation of professional learning, and increasing the diversity of available professional learning pathways. It would also likely help meet many of the desires of the teachers interviewed such as facilitating professional learning which involves collaboration with their colleagues, a focus on the instructional core in their context, and allow for more subject-specific professional learning.

The use of the enquiry cycle model described in figure 16 on p91 provides a structure which recognises the complexity of the process but ensures opportunities for problem identification, professional learning inputs, experimentation, and evaluation are embedded in practice. The exact mode of delivery of professional learning inputs could, and arguably should, vary depending on context and need, and could include the use of different collaborative strategies such as lesson study, instructional coaching and teacher learning communities with many of the active mechanisms identified by Sims et al. (2021) and meeting many of the principles identified by Timperley (2008). Within such an approach it is necessary for teachers to have access to a range of professional learning micro-event opportunities (Evans, 2019) which, given a positive professional environment and culture which promotes teacher agency, would also allow teachers to build appropriate professional learning pathways which meet their needs. These could include a mixture of informal and

formal micro-events through to more extensive structured programmes including masters-level and doctoral-level study. At all levels, input from appropriate knowledgeable others is likely necessary to help challenge the status quo and avoid the "*sharing of ignorance*" (Guskey 1999, p12). This provides a remit for those with roles in the meso-level, including the facilitation of improved networking of colleagues in the micro-level. Such collaborative enquiry-based professional learning could then increase teacher voice (Groundwater-Smith & Mockler, 2010; Sachs, 2003b), as well as being transformative for both individuals and system.

Malleable modes of professional learning

In addition to encouraging collaborative enquiry-based professional learning as described by the model in figure 16 on p91, progress to a greater provision of transformative professional learning could be achieved by ensuring malleable modes of professional learning, see figure 6 on p44, are undertaken in a manner that promotes greater transformative professionalism and with this greater teacher agency and teacher voice. An example from my data was the mentoring of George to address a subject and pedagogical content knowledge deficit in a subject with which he was unfamiliar. This appeared to have a transformative effect on his practice as well as encouraging him to engage in additional professional learning in that subject.

More transformative implementation of malleable modes could also be through the support of masters-level courses with a strong focus on improving teachers' pedagogical content knowledge, and through community of practice-based professional learning such as lesson study, instructional coaching and networked learning communities supported or facilitated by those in the meso-level with appropriate expertise as described by Cobb et al.(2018). Such activities require good leadership and facilitation, access to knowledgeable others and educational research and, alongside other micro-events, could form significant parts of the professional learning pathways compiled by teachers to best meet their needs. As well as the need to prioritise existing time, such provision will likely require additional resource for collaborative working, such as with peers in similar contexts in other schools. However, if embraced fully, lead teachers and the proposed additional non-contact time provide a mechanism to help deliver this in Scotland (Scottish National Party, 2021; SNCT, 2021).

7.2 Recommendations

It can be concluded from this study that there is some way to go for transformative professional learning and a transformative conception of teacher professionalism to be embedded in the Scottish education system with the transformational impacts they promise for both pupil outcomes and system performance. For this to become so, based on the literature and my findings, I make the following recommendations:

Policymakers and leaders in the macro-level and meso-level of the education system

1. National policy guidance should be simplified reducing the number of different initiatives and focusing those remaining on improving instruction in classrooms.
2. School staff with direct experience of teaching pupils should have a much greater input at all levels of policymaking, including at the macro-level of Scottish education. This will better align national priorities with teacher and pupil needs.
3. All actors in the meso-level should focus their support on improving instruction in classrooms and decrease 'top-down' scrutiny and accountability with instead a greater emphasis on peer and community accountability.
4. More time and training/education should be provided for those leading and facilitating professional learning, including as part of headship masters-level courses. This should include a focus on professional enquiry and coaching approaches, to ensure high-quality professional learning is available for all teachers.
5. A significant proportion of any additional non-contact time made available in the future should be devoted to collaborative enquiry-based professional learning rather than used only for preparation and marking, or for administrative and accountability tasks.
6. A greater proportion of professional learning, in both school collegiate time and more individually directed time, should be allocated to well facilitated subject-specific professional learning, including subject networks.
7. A variety of coherent formal and more informal pathways supporting professional learning on different subject topics, different special needs, and different pedagogical strategies, drawing on expertise from within the education system and from external sources, should be developed similar to the range of professional learning in leadership already available.

School senior leaders

1. Improving the instructional core in classrooms should be made a greater priority and not be compromised by processes driven by external scrutiny and accountability agendas.
2. School improvement planning processes should make more use of 'bottom-up' approaches allowing for a greater teacher voice in priority setting and improved alignment with Professional Review and Development with the aim of building an open, trusting, collaborative and supportive professional culture for all school staff.
3. A greater proportion of collegiate and in-service day time in schools should be devoted to collaborative enquiry-based professional learning and subject-specific professional learning with a focus on the instructional core in classrooms. Flexible scheduling arrangements should be used to maximise the use of available time for collaborative enquiry-based professional learning, including time for teachers to embed new learning as habits in their practice.
4. Adequate time and professional learning should be provided for those leading and supporting the learning of colleagues in school and in networks between schools.

Teachers

1. The Professional Review and Development and school improvement planning processes should be used to ensure that the professional learning priorities of teachers are considered and addressed appropriately.
2. Supporting the learning of colleagues should be considered by all as a core part of the role of being a teacher in Scotland.
3. Teachers should have the courage to take opportunities wherever they are available to demonstrate agency, to challenge cultures of compliance, to embed enquiry as stance, and to exhibit transformative professionalism.

This study has shown that there is significant misalignment between policy and practice as it relates to teacher professional learning in Scotland and the reinforcement of the 'middle' recommended by the OECD (2015, p111) has not occurred in a manner which significantly supports improved alignment. Ineffectiveness and inefficiencies in teacher professional learning remain. Fullan (1991) made this statement over thirty years ago:

> "*Nothing has promised so much and has been so frustratingly wasteful as the thousands of workshops and conferences that led to no significant change in practice when teachers returned to their classrooms*." (p315)

It appears to largely apply just as well today. The whole education system needs to work collaboratively to address this issue. This requires a culture shift with a reconceptualization of professional learning away from something that is predominantly transmissive and provider-led towards one which is more practitioner-led with a greater focus on collaborative enquiry-based approaches and a greater recognition of the value of informal professional learning activities as described by Evans (2019).

> "*If the professional learning and development field is to advance meaningfully, we need to re-order that agenda, placing informal and implicit processes in a much higher position than they have hitherto occupied*." (p14)

For this to occur it will need to be accompanied by a redistribution of power within the education system.

7.3 Contribution to knowledge

This study contributes knowledge to the field in several ways. First, it provides a snapshot of the lived experiences of professional learning for a group of secondary teachers from across the north of Scotland. This includes a detailed analysis of data from a full annual cycle as well as an analysis of the professional learning the teachers have experienced through their careers up to the point of the study. Such a snapshot of teacher professional learning is not available elsewhere in the literature. Much of the literature on teacher professional learning is based on research into a particular intervention or meta-studies across the existing literature on professional learning rather than analysing what teachers typically do as part of their normal working lives. Therefore, this analysis of the lived experiences of teachers, together with its comparison with the existing policy guidance, provides important baseline information and an insight into how policy guidance has sometimes been confounded in practice. This study therefore should be essential reading for policymakers wishing to close the policy-practice gap when considering the development of teacher professional learning in the future.

Second, the study includes a systematic analysis of recent national policy documents as they relate to professional learning in Scotland. This builds on the analysis of previous documents such as those by Kennedy, Watson and their colleagues (Kennedy, 2007; Kennedy et al., 2012; Watson & Fox, 2015; Watson & Michael, 2016). Since the mid-2010s, and following the reports on teacher education and teachers' conditions of service of Donaldson (2010) and McCormac (2011) earlier in the decade, there have been significant developments with the potential to impact on how teacher professionalism and teacher professional learning manifest themselves in practice. These include the OECD review of Curriculum for Excellence (OECD, 2015), the development of the National Model of Professional Learning (Education Scotland, 2019), the introduction of the National Improvement Framework (Scottish Government, 2016, 2021), and changes to the governance of education (Scottish Government, 2017, 2019). The critical analysis in this study adds new knowledge as it not only builds on previous analyses, many of which tended to focus on a single development but considers, thanks to its genre chain approach, all the recent national policy documents with significant impact on teacher professional learning. Much in these policy documents, just as the previous ones mentioned above, make references to the empowerment of schools, headteachers, and teachers and to promoting the professionalism of teachers, although as my findings show, a managerial conception of professionalism often dominates in practice and teachers often feel disempowered despite the rhetoric in the statements of policy. The findings from this study also complement those in the recent reports based on extensive reviews of Scottish education (Campbell & Harris, 2023; Hayward, 2023; Muir, 2022), all of which highlight the importance of teacher professional learning and the need for a greater teacher voice in policymaking if educational reform is to be successful. As well as critically analysing the policy documents, this study also reports and analyses how this policy is being enacted and experienced, or not, in current practice. Based on this critical analysis of policy and practice, recommendations are made for consideration by those making and enacting policy at all levels throughout the education system, which is particularly relevant at the time of writing as Scotland is on the cusp of significant educational reform.

Third, during the consideration of the theoretical framework underpinning this study, the model illustrated in figure 16 on p91 was developed. This was developed as a tool to both describe and analyse professional learning likely to embed enquiry as stance. It draws on the conception of enquiry as stance developed by Cochran-Smith and Lytle (2009) and the concept of an experiential learning cycle (Kolb, 1984) and enquiry cycles as explicitly applied

to teacher professional learning (Korthagen & Kessels, 1999; Timperley et al., 2007). The professional learning undertaken by teachers can draw on a range of activities and modes, and from relatively isolated micro-events (Evans, 2019) through to extensive programmes (Cobb et al., 2018). However, for these stimuli to have significant impacts on outcomes, teachers must then work through a process enabling them to enact, reflect and evaluate in a critical, enquiring manner. Therefore, the model combines an enquiry cycle with the change environment of Clarke and Hollingsworth (2002) which provides the ability to describe and analyse the complexity of the professional learning processes taking place within the enquiry cycle over a period of time. Informed by Shulman (1986) and especially Rowland's Knowledge Quartet (2013), at the heart of this model is professional growth in the knowledge-base of the teacher which is focussed on improving the instructional core in classrooms, see figure 19 on p276. By integrating aspects of different models from the literature, this model offers a more comprehensive but practical tool for understanding and developing transformative modes of professional learning compared to those models available previously. It is suitable for those researching or analysing teacher professional learning and professional growth and for those planning teacher professional learning, including teachers themselves.

Finally, figure 21 on p280 and the related discussion, conclusions and recommendations identify drivers which if driven in the appropriate directions could result in a greater alignment of policy and practice for teacher professional learning in Scotland. As has been shown to be the case in high performing education systems (Crehan, 2016; Oates, 2017), better alignment of policy and practice, together with a more coherent and simplified policy landscape, will give consequent benefits for the outcomes for children and young people, teachers, and the education system as a whole. The drivers identified in figure 21 are illustrated acting in the direction in which they most frequently manifest themselves in practice. For example, an overemphasis on accountability and scrutiny, as also reported by Shapira et al. (2023), tends to result in a culture of performativity and therefore to act against the enactment of transformative conceptions of professionalism and the provision of transformative professional learning. Similarly, the initiative overload reported by participants, as also reported in the Muir report (2022, p76), fragments focus and effort reducing the likelihood of transformative professional learning being embedded in practice as a habit. On the other hand, embedding collaborative professional enquiry as stance (Cochran-Smith & Lytle, 2009), including the use of transformative modes of professional

learning, such as practitioner enquiry, lesson study, and instructional coaching (Gilchrist, 2018; Kraft et al., 2018; Sims et al., 2021), acts so as to enhance transformative conceptions of professionalism. The promotion of such modes of professional learning by those leading professional learning and the leaders with significant influence over the professional culture in schools is likely to facilitate teacher agency and promote teacher activism (Priestley et al., 2015; Sachs, 2003). The development of trusting cultures in schools, and within the education system more widely, will give opportunity for a stronger teacher voice in policymaking (Groundwater-Smith & Mockler, 2010), although this is something that also needs to be actively promoted at the macro-level as also recommended by Muir (2022, p23) and Campbell and Harris (2023, p84). At this time of potentially significant educational reform in Scotland, figure 21 provides a simple graphic, underpinned by the analysis of data, to help stimulate discussion of how the different drivers might be used to address the current imbalance in the modes of professional learning currently experienced by teachers in Scotland and therefore help ensure more effective educational reform.

7.4 Limitations, generalisability, and next steps

The limitations of the study are described in chapter 4.9. Although this study gathered data about professional learning journeys from only twelve physics teachers from the north of Scotland, the leader participants had a more national perspective and one which extended beyond teaching physics. Therefore, meaningful lessons can be learned from this study which should be able to be considered more broadly, at the very least across Scottish secondary education but hopefully beyond, particularly as my approach of gathering data on the lived professional learning experiences of practitioners and comparing that with statements of policy appears to be rare.

There is certainly scope for more research in this area, not only across wider geographies, subjects in the secondary sector, and other sectors of education, but for example, by gathering data from different actors within the same school and its support community to explore and compare the perspectives of those at different levels towards the same professional learning activities and/or how policy is enacted. All fourteen of the leaders interviewed had previously been schoolteachers, as is commonly the case for those in leadership positions in the meso-level, and for many in the macro-level of the education system. Throughout their interviews leaders were generally understanding of the complexity

of the demands placed upon teachers. There is scope for further research involving those in educational policymaking who have not come through a teaching route to determine whether this influences decision-making regarding matters relating to teaching and teachers and might contribute to policy-practice misalignment.

The MSc in Teacher Education I completed immediately prior to embarking on this PhD contributed to me authoring or co-authoring seven papers and book chapters. I will now explore publishing papers based on this study, not only on my findings about teacher experiences of professional learning and the policy-practice alignment, but also on some of the work conducted in my preparations and literature review, such as the history of professional learning policy in Scotland and models of professional learning and growth.

7.5 Concluding remarks

As is presumably inevitable for someone undertaking doctoral study part-time over several years, the journey has taken me along a path of personal professional growth which has certainly extended my professional learning roadmap on p336. Although from the outset I had a fairly clear destination in mind there have been some challenges along the way, such as me determining and becoming confident in my approach to systematic documentary analysis. Despite my long experience and insider knowledge of the field, there have also been some unexpected turns and surprises, such as the teacher participants' almost complete lack of awareness and use of national policy documents. There has been some frustration too, particularly the difficulty the automatic transcription software had with my own and many participants' accents together with the jargon laden language universally used by educationalists. Nevertheless, I have enjoyed the journey and consider it to have generated some important new knowledge and understanding about the under researched field that is interplay between policy and practice of teacher professional learning in Scotland; knowledge and understanding I will certainly put to good use in my continued work in the field.

As someone who has worked in Scottish education, both as a teacher and as a teacher educator, for nearly forty years it is easy to identify problems in the system. Nevertheless, Scottish education has many strengths, including national policies with many positive features, but most of all, a well-qualified graduate teaching workforce which, as comes through in my data, wishes to do the best for the children and young people of Scotland. As

with any group of humans there will be variation within it, but a professional workforce of this type has a great capacity to deliver high-quality education and for innovation if allowed to work in supportive, collaborative and trusting environments without overly heavy-handed scrutiny or micro-management.

As I write this in the autumn of 2023, we are on the cusp of significant educational reform in Scotland. If the sorts of reform being proposed (Campbell & Harris, 2023; Hayward, 2023; Muir, 2022; Withers, 2023) are to be realised it is essential that it is founded on teachers' input and teacher professional learning (Stenhouse, 1975). It is pleasing that this is being recognised in report recommendations.

> "*My model is designed to enhance the concept of subsidiarity in practice and, at the same time, bring learners, teachers and practitioners closer to the strategic decision-making process. I see the model ensuring that professional learning is more directed at and responsive to the needs of teachers and practitioners, allowing them to collaborate more and enhance the quality of learning and teaching and the all-important relationship they have with all learners*." (Muir, 2022, p82)

> "*The education workforce should be viewed holistically as a system-wide resources. The recognition, and reward, for the important work undertaken, by all in the workforce needs to be established and reflected in career opportunities and high-quality professional learning to support high-quality practice as a common entitlement for all*." (Campbell & Harris, 2023, p58)

> "*Education staff need time to access professional learning, to collaborate and to engage with the changes being proposed*." (Hayward, 2023, p94)

The data gathered for research question 2 provides a unique snapshot of the lived experiences of professional learning for a group of teachers in Scotland. I hope the findings from all three research questions, and my conclusions and recommendations based on these, are timely and can help inform the important debate about the future direction of education in Scotland as well as make a welcome addition to the literature more broadly.

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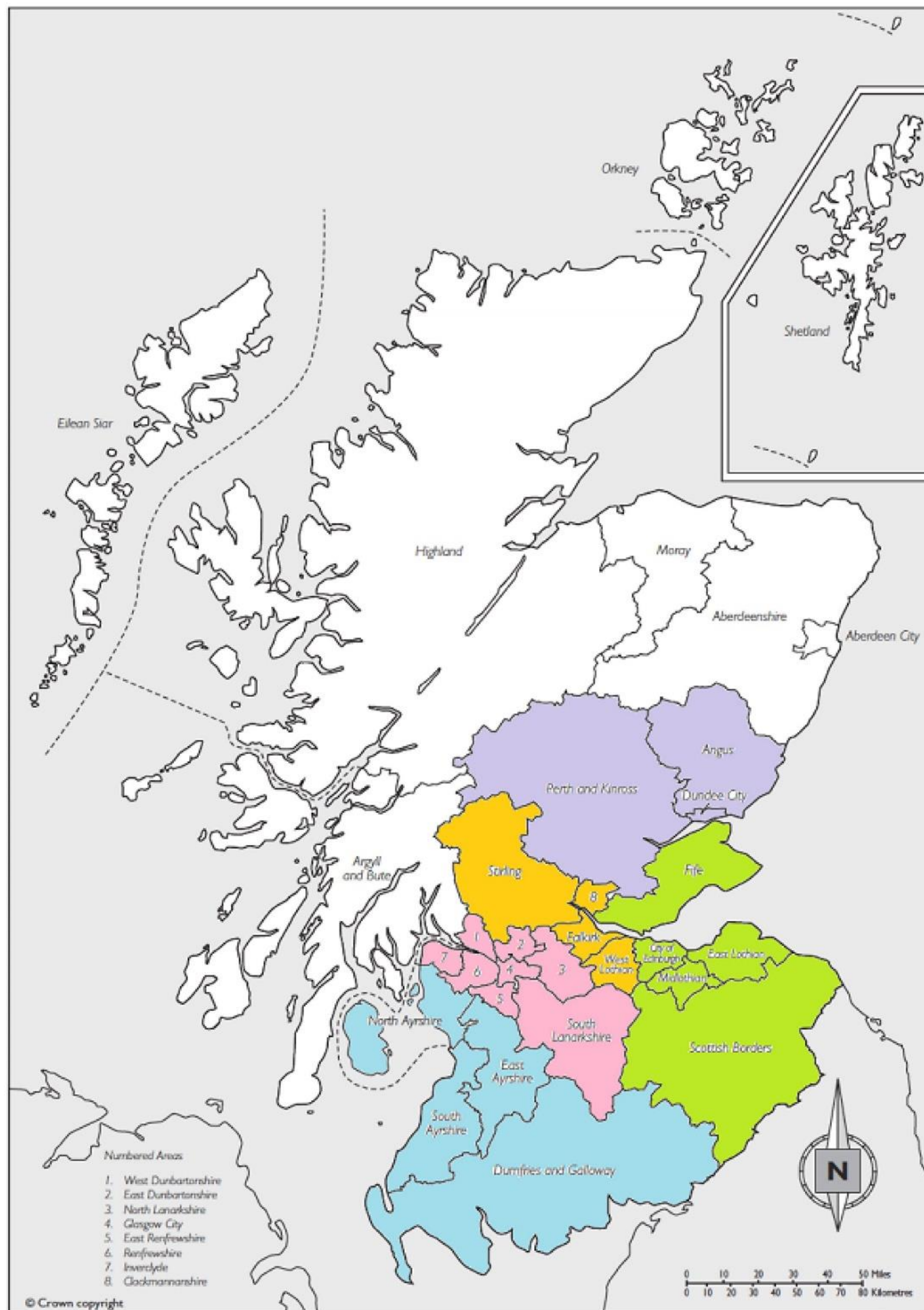
Appendices

Appendix 1

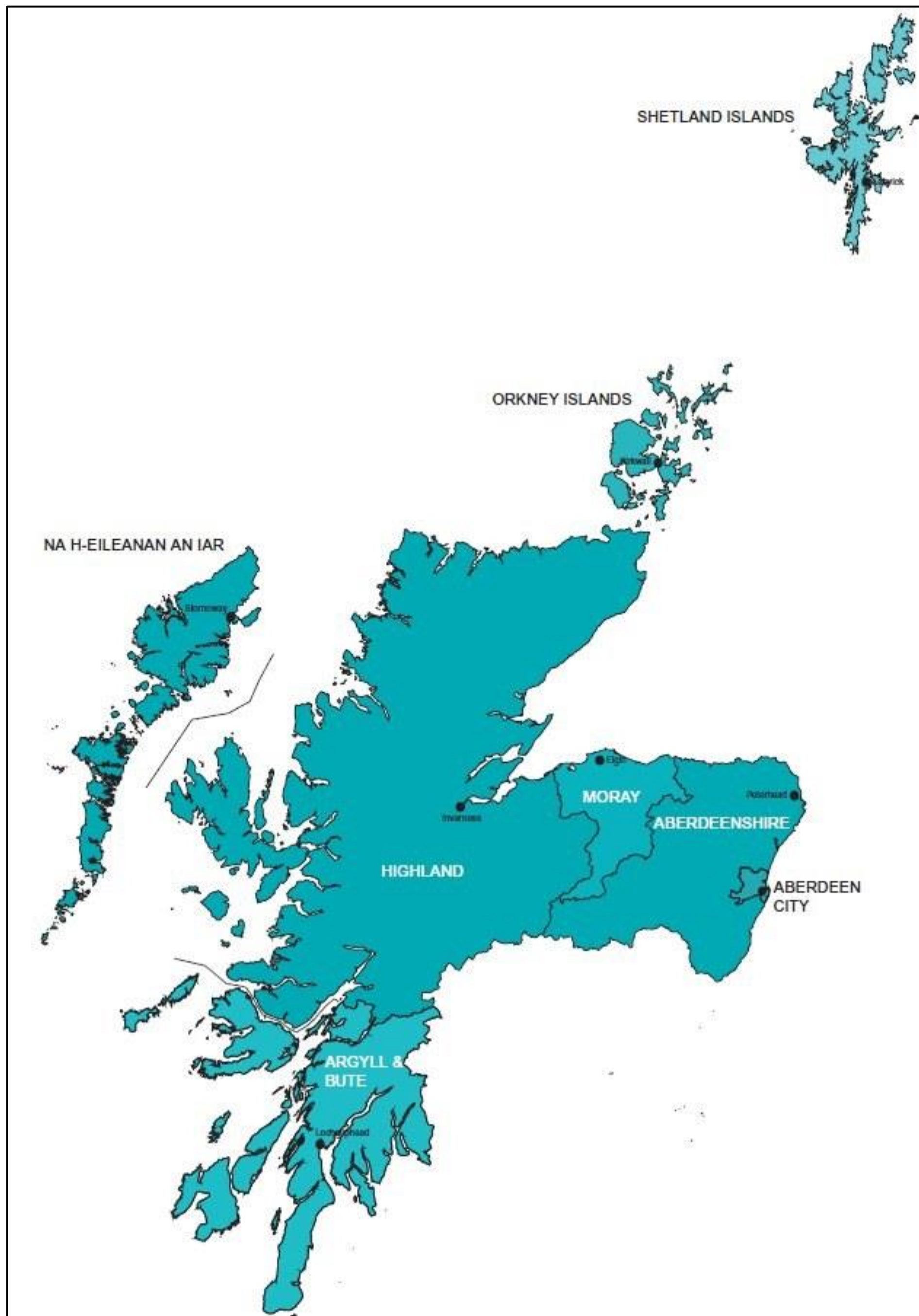
The Northern Alliance Regional Improvement Collaborative and the Scottish Government's Urban Rural Classification

The Northern Alliance Regional Improvement Collaborative (RIC) is one of six in Scotland and is shown as white on the following map.

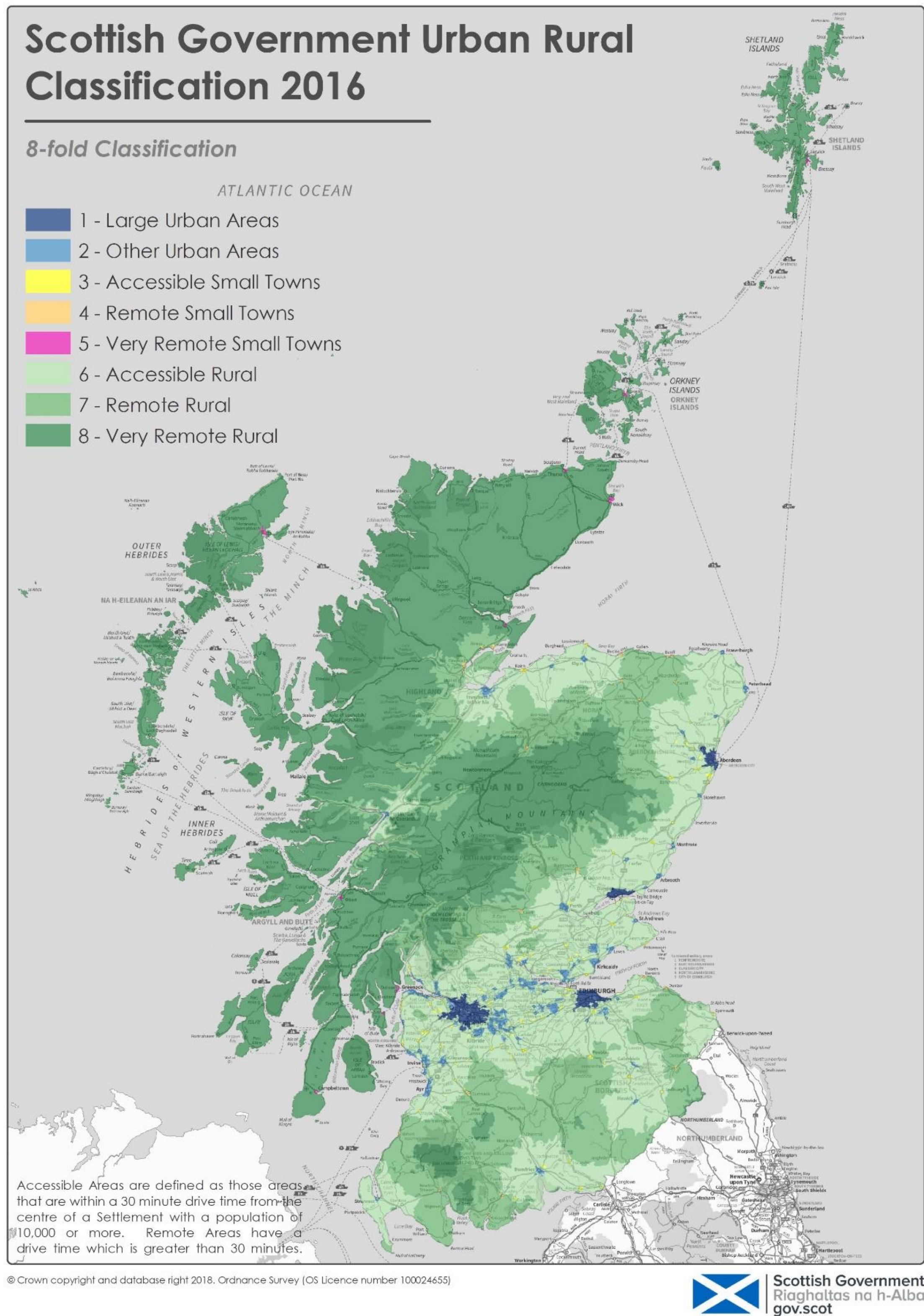


The Northern Alliance includes eight local authorities (randomised as A-H in this study):

- Aberdeen City
- Aberdeenshire
- Argyll and Bute
- Eilean Siar (Western Isles)
- Highland
- Moray
- Orkney Islands
- Shetland Islands



The Northern Alliance covers 58.4% of the landmass of Scotland but includes only 17.9% of Scotland's population. The majority of its landmass is classified as remote or very remote rural using the Scottish Government's Urban Rural Classification (Scottish Government, 2022a).



The definitions of the eight classes in the Scottish Government's 8-fold Urban Rural Classification are:

Class	Class name	Description and examples from the Northern Alliance
1	Large Urban Areas	Settlements of 125,000 people or over, e.g., Aberdeen.
2	Other Urban Areas	Settlements of 10,000 to 124,999 people, e.g., Elgin, Inverness, Inverurie, Peterhead.
3	Accessible Small Towns	Settlements of 3,000 to 9,999 people, and within a 30 minute drive time of a Settlement of 10,000 or more, e.g., Banchory, Kemnay, Lossiemouth, Nairn.
4	Remote Small Towns	Settlements of 3,000 to 9,999 people, and with a drive time of over 30 minutes but less than or equal to 60 minutes to a Settlement of 10,000 or more, e.g., Aviemore, Banff, Dingwall, Huntly, Invergordon.
5	Very Remote Small Towns	Settlements of 3,000 to 9,999 people, and with a drive time of over 60 minutes to a Settlement of 10,000 or more, e.g., Kirkwall, Lerwick, Oban, Stornoway, Tain, Wick.
6	Accessible Rural Areas	Areas with a population of less than 3,000 people, and within a drive time of 30 minutes to a Settlement of 10,000 or more, e.g., Beauly, Fochabers, Kinloss, Mintlaw.
7	Remote Rural Areas	Areas with a population of less than 3,000 people, and a drive time of over 30 minutes but less than or equal to 60 minutes to a Settlement of 10,000 or more, e.g., Aboyne, Alford, Grantown-on-Spey, Portsoy.
8	Very Remote Rural Areas	Areas with a population of less than 3,000 people, and a drive time of over 60 minutes to a Settlement of 10,000 or more, e.g., Bettyhill, Kingussie, Lochgilphead, Stromness, Tobermory, Ullapool.

Appendix 2

National policy documents related to professionalism and professional learning included in the genre chain for analysis

Scottish Negotiating Committee for Teachers Handbook

SNCT. (2007). *SNCT Handbook*. https://www.snct.org.uk/wiki/index.php?title=Table_of_Contents

General Teaching Council for Scotland Professional Standard for Full Registration

GTCS. (2021b). *The Standard for Full Registration: Mandatory Requirements for Registration with the General Teaching Council for Scotland*. Edinburgh: General Teaching Council for Scotland.

General Teaching Council for Scotland Professional Standard for Career-long Professional Learning

GTCS. (2021a). *The Standard for Career-Long Professional Learning: An Aspirational Professional Standard for Scotland's Teachers*. Edinburgh: General Teaching Council for Scotland.

General Teaching Council for Scotland Code of Professionalism and Conduct

GTCS. (2012a). *Code of Professionalism and Conduct*. General Teaching Council for Scotland. Edinburgh: General Teaching Council for Scotland.

General Teaching Council for Scotland Position Paper: Teacher Professionalism and Professional Learning in Scotland

GTCS. (2017). *GTCS Position Paper: Teacher Professionalism and Professional Learning in Scotland*. Edinburgh: General Teaching Council for Scotland.

General Teaching Council for Scotland Unlocking the Potential of Professional Review and Development: Professional Review and Development Guidelines 2019

GTCS. (2019). *Unlocking the Potential of Professional Review and Development*. Edinburgh: General Teaching Council for Scotland.

Education Scotland National Model of Professional Learning

Education Scotland. (2019). *National model of professional learning - detailed poster*. Livingston: Education Scotland.

Education Scotland How Good Is Our School? Livingston: Education Scotland.
Education Scotland. (2015). *How good is our school?* (4th ed.). Livingston: Education Scotland.

Scottish Government National Improvement Frameworks
Scottish Government. (2016). *National Improvement Framework for Scottish Education: Achieving Excellence and Equity*. Edinburgh: The Scottish Government.
Scottish Government. (2016). *2017 National Improvement Framework and Improvement Plan for Scottish Education: Achieving Excellence and Equity*. Edinburgh: The Scottish Government.
Scottish Government. (2017). *2018 National Improvement Framework and Improvement Plan for Scottish Education: Achieving Excellence and Equity*. Edinburgh: The Scottish Government.
Scottish Government. (2018). *2019 National Improvement Framework and Improvement Plan: Achieving Excellence and Equity*. Edinburgh: The Scottish Government.
Scottish Government. (2019). *Achieving Excellence and Equity: 2020 National Improvement Framework and Improvement Plan*. Edinburgh: The Scottish Government.
Scottish Government. (2020). *Achieving Excellence and Equity: 2021 National Improvement Framework and Improvement Plan*. Edinburgh: The Scottish Government.
Scottish Government. (2021). *Achieving Excellence and Equity: 2022 National Improvement Framework and Improvement Plan*. Edinburgh: The Scottish Government.

International Council of Educational Advisers Reports
ICEA. (2018). *Report 2016-2018*. Edinburgh: The Scottish Government.
ICEA. (2020). *Report 2018-2020*. Edinburgh: The Scottish Government.

Organisation of Economic Co-operation and Development Reports on Scottish Education
OECD. (2015). *Improving Schools in Scotland: An OECD Perspective*. Paris: OECD Publishing.
OECD. (2021). *Scotland’s Curriculum for Excellence: Into the Future, Implementing Education Policies*. Paris: OECD Publishing.

Scottish Government Science Technology Engineering Mathematics Education and Training Strategy for Scotland

Scottish Government. (2017). *Science Technology Engineering Mathematics Education and Training Strategy for Scotland*. Edinburgh: The Scottish Government.

Appendix 3

Participant Information Sheet for Teacher Participants

Participant Information Sheet for Teacher Participants

Name of department: Education
Title of the study:
The alignment of policy and practice for the career-long professional learning of teachers in Scotland
Introduction
This study is being conducted by Stuart Farmer (the researcher), a part-time PhD student at the University of Strathclyde, under the supervision of Prof Aileen Kennedy and Dr Saima Salehjee. Stuart taught physics in Scottish secondary schools since 1984 until taking up the role of Education Manager for the Institute of Physics in Scotland in 2019.

Researcher:
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Lead Supervisor:
Professor Aileen Kennedy
Director of Teacher Education
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School of Education
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G4 0LT
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What is the purpose of this research?
It is to investigate the professional learning journey and experiences of teachers of physics in Scottish secondary schools and how this relates to professional learning policy in Scotland.

Do you have to take part?
You have the right to refuse consent to participate or to withdraw from the study at any time, without the need to give a reason and without detriment. If you withdraw from the study your data will be removed from the study, with the exception if the data has already been anonymised and where any interim reports, papers or conference presentations have already been made or published using data you have provided prior to your withdrawal.

What will you do in the project?
During the first few months of 2021 you will be asked to complete a 'roadmap' of significant professional learning events during your career so far. This will then be used as the basis for discussion during a semi-structured interview. This interview will also prepare you for completing a 'diary-log' of your professional learning during one full year from the point of the initial interview. The gathering of data and reflections for the 'diary-log' should enable you to cut and paste easily into your ongoing Professional Review and Development and Professional Update processes hence minimising duplication of effort and significant additional workload for you. After one year a second semi-structured interview will take place. The purpose of this interview is to allow for clarification of data gathered previously, especially your reflections on the impact of your professional learning, and may be relatively 'light touch'. The interviews will take place using a secure University of Strathclyde Zoom video conferencing account to facilitate transcription, to minimise unnecessary social contact, and to reduce travel for environmental reasons. Transcriptions will be shared back with you for checking, amendment and approval. Interviews will take place at a time convenient to you and only in a location you consider sufficiently secure and appropriate. The 'diary-log' will be completed on a private Goggle Sheet shared by the researcher with yourself and with the researcher's supervisors on demand to ensure ethical procedures are followed and to help advise the researcher.

Why have you been invited to take part?
The teacher participants being sought for this study are physics teachers in schools within the Northern Alliance Regional Improvement Collaborative who are either at the top of the main teachers' salary scale or are Principal Teachers of Physics/Science. This is minimise some of the large number of variables in the potential participant group and to ensure a minimum length of career for analysis. Participants will be selected to ensure the gender balance of the profession is represented and that a range of different sizes of schools in different geographical locations are represented.

What are the potential risks to you in taking part?
The risks to you of taking part are very low. Your responses will be anonymised and pseudonyms used in the thesis and any published papers resulting from the study. You will be given an opportunity to choose your pseudonym. The transcripts of your interviews will be shared with you for checking for accuracy and to check to ensure there is nothing which they would not wish to have included in an anonymised quote in the final thesis or any publications or presentations based on the study.

What information is being collected in the project?
As well as the 'roadmap', interview and 'diary log data from you and around ten other teachers, interviews will be conducted with around ten school and education system leaders with some responsibility for facilitating and providing professional learning for teachers in the Northern Alliance. Coding and pseudonym data will be kept separate from the data collected from you and other participants. Data will also be gathered from analysis of publicly available policy documents relating to the professional learning of teachers in Scotland.

Who will have access to the information?
Data will only be accessible to the researcher and his supervisors, and to PhD examiners if required.

Where will the information be stored and how long will it be kept for?

Your data will be stored confidentially on the Principal Investigator's password protected computer and a password protected folder on cloud storage system within the University of Strathclyde and within locked storage for paper-based notes. All research data and records will be stored for a maximum retention period of five years after successful completion of the study to allow for subsequent publications. Data will be disposed of in accordance with the University of Strathclyde's Code of Practice for Investigations Involving Human Beings. Anonymous research data may be retained indefinitely by depositing it in a suitable data repository. Please also read our Privacy Notice for Research Participants.

What happens next?

Thank you for reading this information – please contact me at stuart.farmer@strath.ac.uk to ask any questions if you are unsure about what is written here. If you would like to participate in this study, please complete the Participant Consent Form and return it to me at stuart.farmer@strath.ac.uk. If you do not want to participate, thank you for your attention thus far.

If you agree to participate in this study, the research will be written up as a thesis and in journal articles and presentations at conferences. On successful submission of the thesis, it will be deposited both in print and online in the University archives, to facilitate its use in future research. The thesis will be published open access.

This research was granted ethical approval by the School of Education Ethics Committee at the University of Strathclyde. If you have any questions/concerns, during or after the research, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

Prof David Kirk and/or Dr Katja Frimberger
Ethics Co-Chairs
School of Education Ethics Committee
School of Education
University of Strathclyde
Faculty of Humanities and Social Sciences
Email: hass-edu-ethics@strath.ac.uk

Appendix 4

Teacher Participant Semi-structured Interview Schedule

Teacher Semi-structured Interview Schedule

The alignment of policy and practice for the career-long professional learning of teachers in Scotland

During this interview you will be asked to consider your teacher professional learning journey to this point in time, and to identify the most significant professional learning events during your career to date.

1. Please give me a brief summary of your journey into teaching and your career to date.

2. Using a diagrammatical 'roadmap' to assist you, please describe the most significant events and/or activities along your professional learning journey, particularly ones that have resulted in changes in your practices and beliefs, i.e. professional growth. Describe the types of professional learning you commonly undertake or are commonly or currently available to you. For example, these professional learning events/activities could take place both formally or informally, be planned or unplanned, be undertaken privately as an individual, in school with colleagues, or outwith school. For each consider:
   (a) Describing the professional learning event.
   (b) Where and with whom you undertook this professional learning.
   (c) How valuable or useful you consider this professional learning to have been.
   (d) What impact you consider this professional learning to have had on your professional growth.

3. Are there types of professional learning you would like to undertake but are unable to?
   (a) Why would you value such professional learning?
   (b) Why are you not able to undertake this professional learning?

4. Which of the following situations would you classify as involving professional learning which might lead to your professional growth? I will use a short questionnaire pro forma during your interview to collect your answers to this question.

   (a) informal discussion/working with departmental colleagues, e.g. discussion over coffee in staff-base or in corridor
   (b) informal discussion/working with other school colleagues, e.g. discussion during lunch in staffroom or in car park at the end of the day
   (c) informal discussion/working with others, e.g. discussion with relatives, friends, former colleagues
   (d) formal discussion/working with colleagues, e.g. departmental meeting, joint resource development
   (e) formal discussion/working with others. e.g. member of professional association committee, working as Brownie leader

(f) in-school workshop/meeting/PLC, e.g. school organised session during a lunchtime, member of school working group, member of school-based professional or teacher learning community
(g) in-service day activity, e.g. lecture or seminar during whole school or local authority in-service day
(h) subject-based network meeting, e.g. twilight meeting of local physics teachers
(i) out-of-school workshop, e.g. local authority organised afternoon workshop
(j) twilight, evening, or weekend workshop, e.g. IOP workshop, Pedagoo or TeachMeet events
(k) conference, e.g. attending IOP Stirling Meeting, SSERC course, ASE Scotland conference, Scottish Learning Festival
(l) private reading/research (book, journal, online etc), e.g. background reading and research for a new curriculum topic or regularly listening to a particular podcast
(m) formal study for qualification, e.g. study for a MOOC, Education Scotland Teacher Leadership course, MEd, first-aid update
(n) being coached/mentored, e.g. supported one-to-one by colleague
(o) coaching/mentoring others, e.g. mentoring student teachers and probationers

5. Are there other types or activity not included in 4 above which you consider to be professional learning?

6. Describe briefly what you would consider to be your ideal professional learning journey in the coming year or more.

7. In addition to interviewing teachers and leaders I am analysing professional learning policy documentation. In what ways have national, RIC, local authority, school or faculty policies supported your professional learning?
   Please provide examples of any policy documents relating to or supporting your professional learning.

8. Is there anything you feel we have not discussed which is important in this area?

Appendix 5

Teacher Participant Roadmap Template, and Exemplar Professional Learning Journeys

Teacher Roadmap Template

The alignment of policy and practice for the career-long professional learning of teachers in Scotland

Instructions for completion of a diagrammatical Roadmap of your professional learning journey

The purpose of this activity is for you to reflect on your professional learning journey and the important events and activities which have helped shape you as a teacher. I have provided a simple template on the third page as starting point to illustrate your professional learning journey to this point in time. The template is intended to help you identify and visualise the important events and activities which have helped you to grow as a teacher. The roadmap is centred along a time line to the present day. This may start with your Initial Teacher Education but may well include events predating that, for example, from your own school education or personal life. You should decide what the important events in your professional learning journey are and at which point that journey began. Please date (to the nearest year and perhaps month as best you can) and describe briefly what these events or activities were, sufficient to act as prompts for discussion during your interview. There might also be several parallel or interconnected routes as few people develop through life in a predictable, serial fashion. Therefore, if you wish to expand on this simple template by adding additional lines or expanding on to additional sheets of paper then please do. Please use whatever notation or format you think will help you to best explain your professional learning journey to me.

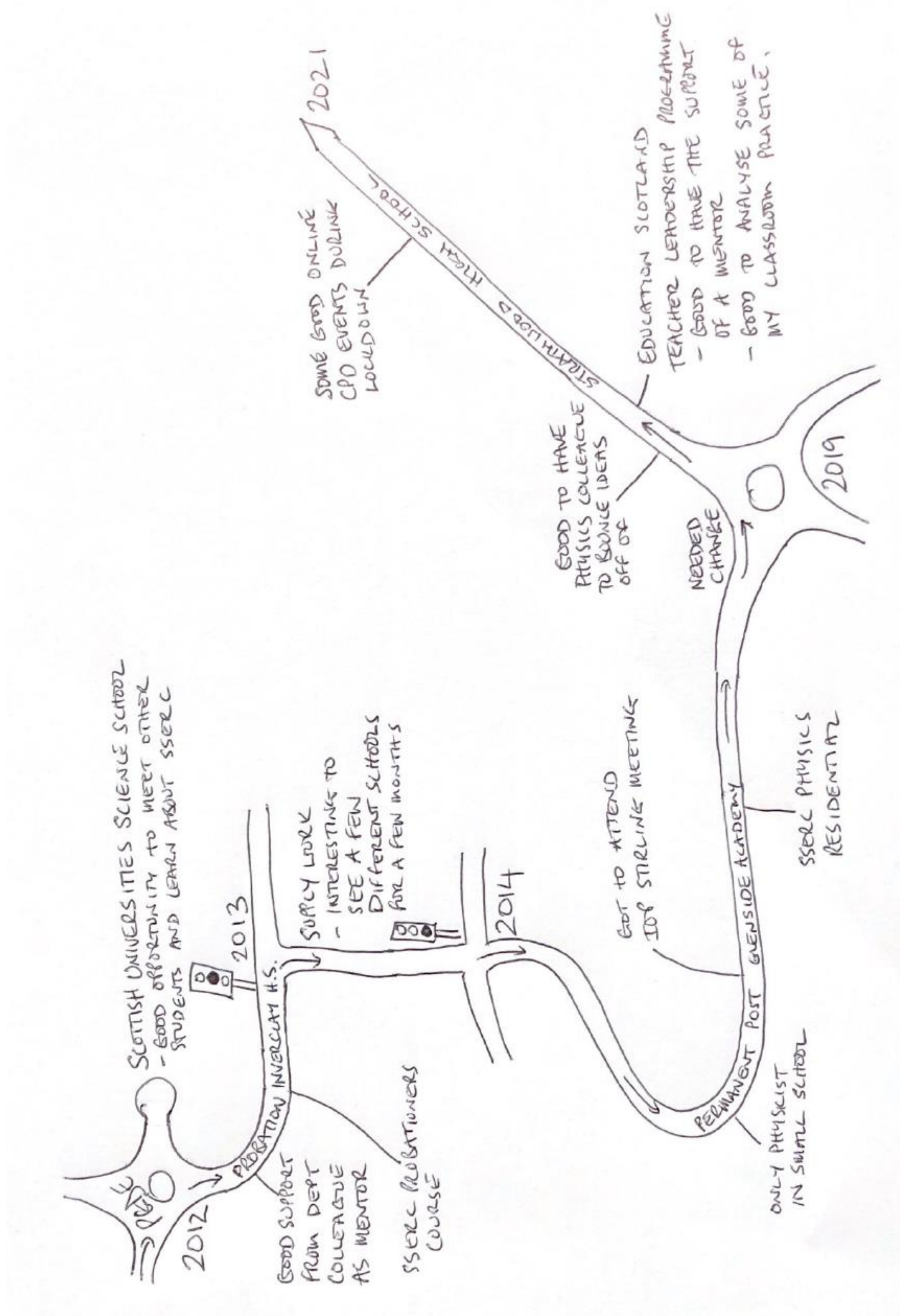
By way of exemplification and stimulation I have included two exemplar roadmaps on pages 4 and 5. The first is a fictitious one based on a design and information sent to me by another when I asked them to draw their roadmap. It very much takes a literal approach and is a roadmap with significant events and career information for a teacher with about eight years of experience. The second is one I constructed for my own professional learning journey through my career. I am very well aware this is an extreme and possibly intimidating example as my professional learning journey is both very long and complex and I have been involved in many events and activities which I feel have resulted in my professional growth. You will see I have used a format which combines elements of a traditional roadmap, a stylised railway map, and a circuit diagram. It has roads of different importance, junctions, roundabouts where I made career decisions to change job, slip roads where things feed into each other, and points where sections bridge over each other. You will see that as my career progressed it got more complex and interlinked. As well as specific events, such as conferences and even a few individual workshops I can remember as including ‘ah-ha’ moments, it includes some activities undertaken with colleagues, and the times where I first met people who were influential in shaping the direction in which my professional learning then took, such as Ian Shanks, who was the main driving force behind the Optoelectronics College, and Greg Dick the Executive Director at the Perimeter Institute.

I hope that these two exemplar roadmaps act as prompts for your own reflection on what has been important to you in your own career and professional learning journey. Please do not feel constrained by these two representations, if you have an alternative way of presenting your data with which you feel comfortable please use that, all that I ask is that you reflect on your professional learning journey and present key events and activities in a manner that helps us discuss your professional learning during your interview.

As we cannot meet face-to-face around a table to discuss your roadmap, a day or two before your interview with me, I would like you to photograph of scan your roadmap and email it to me so we can both have copies of it in front of us during the interview. If during your interview you make any additions or amendments to your roadmap, I would like you to email me a photograph or scan of this final version to me also.

present day

Exemplar professional learning journey 1



Exemplar professional learning journey 2

Appendix 6

Diary-log instructions and details of fields to be completed by teacher participants

Teacher Diary-log

The alignment of policy and practice for the career-long professional learning of teachers in Scotland

Instructions for completion of online Diary-log of professional learning activities

Whenever you participate in a professional learning activity please complete an entry in your online Diary-log of professional learning activities, i.e. along one row of the spreadsheet. For each activity please identify the date and duration of the activity followed by the 'Mode of PL' selected from the dropdown menu. Examples are given below to illustrate the types of professional learning activities corresponding to each mode. Please indicate, using the dropdown menu, the type of 'Location of PL' in which the professional learning took place. Finally at the time of undertaking the professional learning please record your immediate assessment of the usefulness of the professional learning activity using the 1 to 4 rating scale plus a comment to justify that rating.
Several weeks after the date of the activity, please reconsider the usefulness or impact the professional learning activity has had on your professional growth and/or practices, and finally once again at the end of the study after one full calendar year from the beginning of the study. It may only be possible to make one reflective entry for any professional learning activity taking place within the last few weeks of the year of the study.
The aim is to maintain a full and accurate record of your professional learning for a full annual cycle and for you to reflect on the impact these activities might have had on your professional growth and practices. I hope that the data recorded, and reflection you undertake, can be easily cut and pasted from you Diary-log into your Professional Review and Development (PRD) and/or Professional Update (PU) record against the appropriate GTCS Standard making it easy for you to complete a comprehensive record for those purposes too. Your Diary-log will only be accessible by you and me, plus my two University of Strathclyde supervisors, Professor Aileen Kennedy and Dr Saima Salehjee, should they request to see it in order to assess the progress of the study.

Diary-log Fields

The information below details the information that will be sought in the fields, i.e. columns, of the Google Sheet used to collect the Diary-log data. Some of the fields will have open response cells, such as the data, duration, and title of professional learning event. For ease of use other fields will have drop-down menus with a variety of options to select, some with illustrative examples to help guide you, e.g. mode of professional learning.

1. Date of PL

2. Duration of PL / minutes

3. Mode of PL, and examples

informal discussion/working with departmental colleagues	discussion over coffee in staff-base or in corridor
informal discussion/working with other school colleagues	discussion during lunch in staffroom or in car park at the end of the day
informal discussion/working with others	discussion with relatives, friends, former colleagues
formal discussion/working with colleagues	departmental meeting, joint resource development
formal discussion/working with others	member of professional association committee, working as Brownie leader
in-school workshop/meeting/PLC	school organised session during a lunchtime, member of school working group, member of school-based professional/teacher learning community
in-service day activity	lecture or seminar during whole school or local authority in-service day
subject-based network meeting	twilight meeting of local physics teachers
out-of-school event/workshop	local authority organised afternoon workshop
twilight, evening or weekend workshop	IOP workshop, Pedagoo or TeachMeet event
conference	IOP Stirling Meeting, SSERC course, ASE Scotland conference, Scottish Learning Festival
private reading/research (book, journal, online, podcast etc)	background reading and research for a new curriculum topic or listening to an educational podcast
formal study for qualification	study for a MOOC, Education Scotland Teacher Leadership course, MEd, first-aid update
being coached/mentored	supported one-to-one by colleague
coaching/mentoring others	mentoring student teacher or probationer
other (please specify):	

4. Location of PL

home/private location
in department/faculty
elsewhere in school
in local school/local authority premises
in school elsewhere/college/university
in coffee shop/pub etc
in conference centre/hotel
online webinar/event
other (please specify)

5. Title/topic of PL

6. Immediate assessment of usefulness of PL

1 - not at all useful
2 - a little useful
3 - reasonably useful
4 - very useful

Comment:

7. Reflection on impact/professional growth due to PL

Date of reflection:

Comment:

8. End of year reflection on impact/professional growth due to PL

Date of reflection:

1 - not at all useful
2 - a little useful
3 - reasonably useful
4 - very useful

Comment:

9. Additional comments

Appendix 7

Modes of teacher professional learning

Mode of professional learning	Examples of activities within this mode
Informal discussion/working with departmental colleagues	Discussion over coffee in staff base or in corridors
informal discussion/working with other school colleagues	discussion during lunch in staffroom or in car park at the end of the day
informal discussion/working with others	discussion with relatives, friends, former colleagues
formal discussion/working with colleagues	departmental meeting, joint resource development
formal discussion/working with others	member of professional association committee, working as Brownie leader
in-school workshop/meeting/PLC	school organised session during a lunchtime, member of school working group, member of school-based professional/teacher learning community
in-service day activity	lecture or seminar during whole school or local authority in-service day
subject-based network meeting	twilight meeting of local physics teachers
out-of-school event/workshop	local authority organised afternoon workshop
twilight, evening, or weekend workshop	IOP workshop, Pedagoo or TeachMeet event
conference	IOP Stirling Meeting, SSERC course, ASE Scotland conference, Scottish Learning Festival
private reading/research (book, journal, online, podcast etc)	background reading and research for a new curriculum topic or listening to an educational podcast
formal study for qualification	study for a MOOC, Education Scotland Teacher Leadership course, MEd, first-aid update
being coached/mentored	supported one-to-one by colleague
coaching/mentoring others	mentoring student teacher or probationer

Appendix 8

Teacher participants

Albert
Teacher of physics (and two additional subjects) with >20 years of experience.
Teaches in a school with an approximate roll of 1200 in an other urban area[1] in local authority D.

Andrew
Teacher of physics and principal teacher with <10 years of experience
Teaches in a school with an approximate roll of 700 in a remote rural area in local authority D.

Ava
Teacher of physics with >20 years of experience
Teaches in a school with an approximate roll of 850 in an accessible small town in local authority D.

Calum
Teacher of physics and principal teacher with >20 years of experience
Teaches in a school with an approximate roll of 450 in an accessible rural area in local authority E.

Clara
Teacher of physics (and two additional subjects) with >20 years of experience
Teaches in a school with an approximate roll of 350 in a very remote rural area in local authority F.

Dani
Teacher of physics and principal teacher with 10-20 years of experience
Teaches in a school with an approximate roll of 1000 in a remote small town in local authority D.

David
Teacher of physics (and an additional subject) with <10 years of experience
Teaches in a school with an approximate roll of 100 in a very remote rural area in local authority A.

George
Teacher of physics (and an additional subject) with 10-20 years of experience
Teaches in a school with an approximate roll of 100 in a very remote rural area in local authority C.

Gill
Teacher of physics (and an additional subject) and principal teacher with >20 years of experience
Teaches in a school with an approximate roll of 400 in a remote small town in local authority E.

John
Teacher of physics with 10-20 years of experience
Teaches in a school with an approximate roll of 1000 in a very remote small town in local authority B.

Luke
Teacher of physics in local authority E with 10-20 years of experience
Teaches in a school with an approximate roll of 850 in an accessible small town in local authority E.

Neal
Teacher of physics (and an additional subject) and principal teacher with >20 years of experience
Teaches in a school with an approximate roll of 150 in a very remote rural area in local authority H.

[1]School location information is from the Scottish Government's Urban Rural 8-fold Classification (Scottish Government, 2022a)

Appendix 9

Teacher Participant Follow-up Semi-structured Interview Schedule

Teacher Follow-up Semi-structured Interview Schedule

The alignment of policy and practice for the career-long professional learning of teachers in Scotland

During the last year you have logged and reflected on your professional learning.

1. Describe the professional learning activities you have participated in during the last year which you consider to have had the greatest impact on your professional practices and/or professional growth. Please consider:
   (a) What changes in your practice or professional growth has resulted from the professional learning.
   (b) Why these activities have led to these changes.
   (c) Whether or not these activities could have been improved to increase their impact, and if so, how.

2. Describe the professional learning activities you have participated in during the last year which you consider to have **not** had a significant impact on your professional practices and/or professional growth. Please consider:
   (a) Why these activities have not led to changes in your practice or professional growth.
   (b) Whether or not these activities could have been improved to increase their impact, and if so, how, or if not, why not.

3. Were there types of professional learning you would have liked to undertake but were unable to?
   (a) Why would you have valued such professional learning?
   (b) Why were you not able to undertake this professional learning?

4. In what ways have national, RIC, local authority, school or faculty policies, structures and support facilitated your professional learning during the last year?
   (a) During the last year have you referred to any of the following?
   GTCS Standards
   National Model of Professional Learning
   Local Authority PRD or PU policy or guidance documents
   National Improvement Framework
   HGIOS
   School Improvement Plan
   (b) If you referred to any of these documents, in what ways did you use them, and did they help you plan or identify your professional learning?
   (c) Did you use any other documents to shape or guide your professional learning?

5. How well aligned do you consider the professional learning provided during school in-service days and collegiate time and that necessary for addressing areas of your School Improvement Plan are with your own professional learning priorities?

6. (a) How aware are you of professional learning available to you from the Northern Alliance RIC?
   (b) Did you participate in any national, RIC, or local authority provided professional learning, and if so, what impact has it had on your practice?

7. Having reflected on your professional learning during the last year, what are your professional learning plans or priorities for the year ahead?

8. Is there anything you feel we have not discussed which is important in this area?

Appendix 10

Illustration of grouping of themes

The following tables illustrate the how the initial themes used to code expressions in the teachers and leaders interview transcripts were grouped as findings emerged. Many expressions were coded into more than one theme and in some cases aspects of some of the initial coded themes fed into more than one of the finding themes. In addition, some additional themes, such as the role of enquiry-based professional learning, only emerged as a distinct theme when the findings from the document analysis, leaders' interviews, and teachers' data were compared.

Teachers - initial coded themes	**Teachers - findings themes**
Local authority professional learning	Whole-school professional learning programmes
Local authority, regional improvement collaborative, and Education Scotland	
Problem-based learning (PBL)	
Mentoring and coaching	Mentoring and coaching
Collaboration with colleagues	Collaboration with colleagues
Informal collaboration with colleagues etc	
Formal collaboration with colleagues etc	
Working with colleagues	
In-service days	Use of in-service days
Poor professional learning	
Subject-specific professional learning	Subject-specific professional learning
IOP and SSERC	
Local authority networks	
Northern Alliance	
Engineering science	
Professional Review and Development (PRD) and Professional Update (PU)	Professional Review and Development (PRD) and Professional Update (PU)
Professional learning recording process	

Teachers - initial coded themes	Teachers - findings themes
Use of policy documents	Use of policy documents
School Improvement Plan	
Decision-making on access to professional learning	Tensions in professional learning ownership and decision-making
Alignment of professional learning	
Leadership of professional learning	
Management and leadership	
Professional learning priorities	
Improving career-long professional learning	
Most valued professional learning	
Empowerment	Empowerment and teacher agency
Teacher agency	
Ideal professional learning	Ideal professional learning journeys and the barriers to their realisation
Professional learning participants would like to undertake	
Professional learning unable to do	
Barriers to professional learning	
Habits and change	

Leaders - initial coded themes	Leaders - findings themes
Policy alignment	Policy documents and their alignment
Policy documents	
Leadership of professional learning	Leadership of professional learning
Professional Review and Development (PRD) and Professional Update (PU)	Professional Review and Development (PRD) and Professional Update (PU)
Empowerment	Empowerment and culture
Accountability	Tensions in professional learning ownership and decision-making
Self-selecting participation in professional learning	
In-service days and collegiate time	In-school collaboration and in-service days
Collaboration	
Local authority networks	The role of local authorities and regional improvement collaborative
Regional improvement collaboratives	
Probationer professional learning	Classroom teacher professional learning
Post-probation professional learning	
Effective professional learning	
Ideal blend of professional learning	
Masters level professional learning	
Purpose of professional learning	
Valued professional learning	
Subject-specific professional learning	Subject-specific professional learning
Professional associations	
Barriers to professional learning	Barriers to professional learning

Appendix 11

Leader participants

Billy
Quality improvement officer in local authority E.

Bruce
Headteacher in school in an accessible small town[1] in local authority E.

Elizabeth
Officer in a national agency with a remit linked to the Northern Alliance

Emma
Officer in a national agency

Fiona
Lead specialist in the Northern Alliance

James
Senior officer in a professional association

Ken
Depute headteacher in a very remote small town in local authority B

Kevin
Officer in a national agency

Linda
Director in a national agency

Mary
Senior officer in local authority B

Paul
Director in a national agency

Peter
Lead specialist in a national agency with a remit linked to the Northern Alliance

Sam
Headteacher in a school in a large urban area in local authority G also with a system leadership role

Stephen
Depute headteacher in a school in an other urban area in local authority D

[1]School location information is from the Scottish Government's Urban Rural 8-fold Classification (Scottish Government, 2022a)

Appendix 12

Participant Information Sheet for Leader Participants

Participant Information Sheet for Leader Participants

Name of department: Education
Title of the study:
The alignment of policy and practice for the career-long professional learning of teachers in Scotland
Introduction
This study is being conducted by Stuart Farmer (the researcher), a part-time PhD student at the University of Strathclyde, under the supervision of Prof Aileen Kennedy and Dr Saima Salehjee. Stuart taught physics in Scottish secondary schools since 1984 until taking up the role of Education Manager for the Institute of Physics in Scotland in 2019.

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What is the purpose of this research?
It is to investigate the professional learning journey and experiences of teachers of physics in Scottish secondary schools and how this relates to professional learning policy in Scotland.

Do you have to take part?
You have the right to refuse consent to participate or to withdraw from the study at any time, without the need to give a reason and without detriment. If you withdraw from the study your data will be removed from the study, with the exception of the data has already been anonymised and where any interim reports, papers or conference presentations have already been made or published using data you have provided prior to your withdrawal.

What will you do in the project?
During the second half of 2021 you will be asked to participate in a semi-structured interview about the professional learning of teachers in Scotland. This will relate to policy and practice and will follow the beginning of a process to gather data on professional learning experiences of twelve teachers of physics which began in the first half of 2021 and will continue through into 2022. The interview will take place using a secure University of Strathclyde Zoom video conferencing account to facilitate transcription, to minimise unnecessary social contact, and to reduce travel for environmental reasons. Transcriptions will be shared back with you for checking, amendment and approval. The interview will take place at a time convenient to you and only in a location you consider sufficiently secure and appropriate.

Why have you been invited to take part?
The leader participants being sought for this study are leaders with some responsibility for professional learning in schools and local authorities within the Northern Alliance Regional Improvement Collaborative, or national agencies or organisations with a responsibility for facilitating and delivering professional learning across Scotland, including the Northern Alliance.

What are the potential risks to you in taking part?
Your responses will be anonymised and pseudonyms used in the thesis and any published papers resulting from the study. You will be given an opportunity to choose your pseudonym. The transcripts of your interviews will be shared with you for checking for accuracy and to check to ensure there is nothing which they would not wish to have included in an anonymised quote in the final thesis or any publications or presentations based on the study. Therefore, even if you are in a relatively unique role within Scottish education, the risk to you should be very low.

What information is being collected in the project?
As well your interview, interviews will be conducted with around a dozen other school and education system leaders with some responsibility for facilitating and providing professional learning for teachers in the Northern Alliance. In addition interview and 'diary-log' data will be gathered from around ten teachers of physics from schools across the Northern Alliance. Coding and pseudonym data will be kept separate from the data collected from you and other participants. Data will also be gathered from analysis of publicly available policy documents relating to the professional learning of teachers in Scotland.

Who will have access to the information?
Data will only be accessible to the researcher and his supervisors, and to PhD examiners if required.

Where will the information be stored and how long will it be kept for?
Your data will be stored confidentially on the Principal Investigator's password protected computer and a password protected folder on cloud storage system within the University of Strathclyde and within locked storage for paper based notes. All research data and records will be stored for a maximum retention period of five years after successful completion of the study to allow for subsequent publications. Data will be disposed of in accordance with the University of Strathclyde's Code of Practice for Investigations Involving Human Beings. Anonymous research data may be retained indefinitely by depositing it in a suitable data repository. Please also read our Privacy Notice for Research Participants.

What happens next?
Thank you for reading this information – please contact me at stuart.farmer@strath.ac.uk to ask any questions if you are unsure about what is written here. If you would like to participate in this study please complete the Participant Consent Form and return it to me at stuart.farmer@strath.ac.uk. If you do not want to participate, thank you for your attention thus far.

If you agree to participate in this study, the research will be written up as a thesis and in journal articles and presentations at conferences. On successful submission of the thesis, it will be deposited both in print and online in the University archives, to facilitate its use in future research. The thesis will be published open access.

This research was granted ethical approval by the School of Education Ethics Committee at the University of Strathclyde. If you have any questions/concerns, during or after the research, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:
Prof David Kirk and/or Dr Katja Frimberger
Ethics Co-Chairs
School of Education Ethics Committee
School of Education
University of Strathclyde
Faculty of Humanities and Social Sciences
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Appendix 13

Leader Participant Semi-structured Interview Schedule

Leader Semi-structured Interview Schedule

The alignment of policy and practice for the career-long professional learning of teachers in Scotland

1. Describe the professional learning journey you would expect a typical classroom teacher, with perhaps ten years of experience to have followed, and the sorts of professional learning activities with which you would expect classroom teachers to engage in during an academic year.

2. Describe what you see as the main purposes of professional learning for teachers.

3. Describe what you consider would be an ideal blend of professional learning for teachers. This could include the use of school collegiate time such as in-service days, other faculty, school, local authority or RIC activities, national organisation activities, third sector activities, private study, and/or university courses.

4. Describe what you consider to be the most significant obstacles for the provision of an ideal blend of professional learning.

5. Describe how you facilitate and support teachers undertake professional learning.

6. There is a potential for tension between individual and institutional priorities for professional learning. How can professional learning be best managed to ensure both individual and wider education system needs are met?

7. Teachers typically report (INFORMATION INSERTED ON THE DAY OF THE INTERVIEW AND FOLLOWING INITIAL DATA GATHERING FROM TEACHERS) regarding their professional learning. Please comment on this.

8. In addition to interviewing teachers and leaders I am analysing professional learning policy documentation. In what ways have national, RIC, local authority, school, or faculty policies supported teacher professional learning?
   Please provide examples of any policy documents relating to the delivery of professional learning that you consider to be particularly important.

9. What policy documentation do you consider teachers should draw upon to guide their professional learning?

10. How should the system best empower practising teachers in relation to their professional learning?

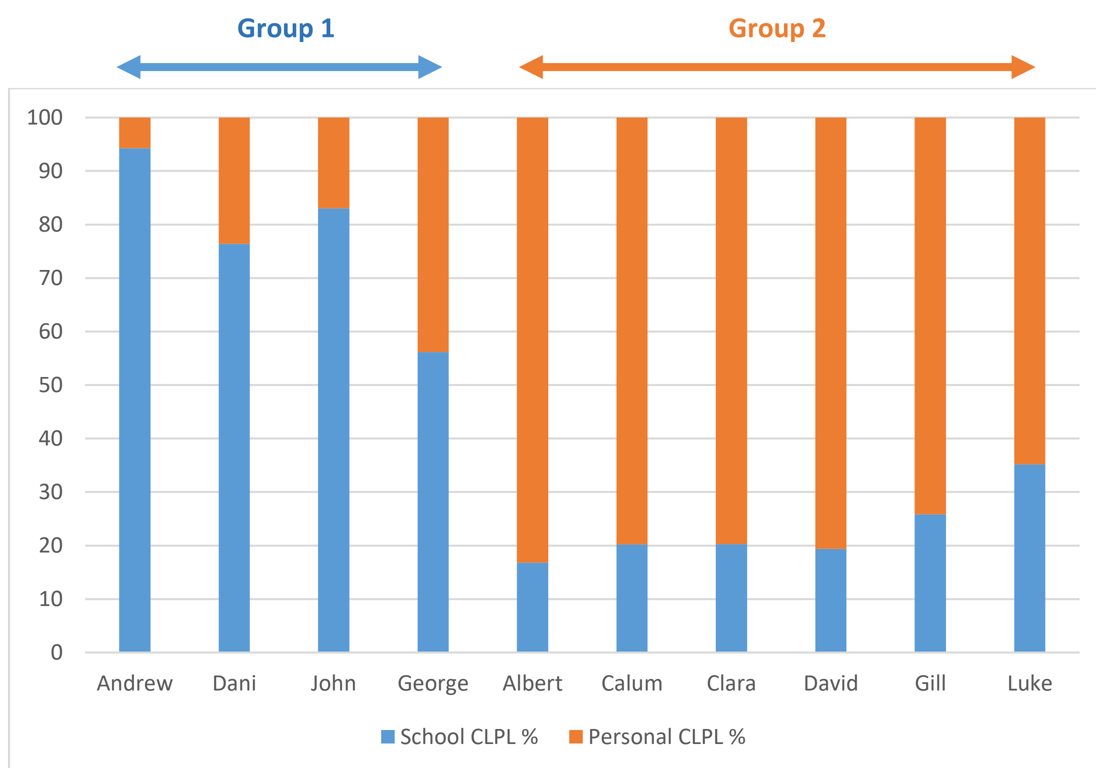
11. Is there anything you feel we have not discussed which is important in this area?

Appendix 14

Summary of diary-log entries of teacher participants – subgroups 1 and 2

Subgroup	Teacher	Number of CLPL activities logged	CLPL hours	School[1] CLPL hours	Personal[2] CLPL hours	School CLPL %	Personal CLPL %
1A	Andrew	16	52.7	49.7	3.0[3]	94	6
	Dani	41	67.8	51.8	16.0	76	24
	John	20	26.7	22.2	4.5	83	17
1B	George	28	56.3	31.6	24.7	56	44
2[4]	Albert	12	33.8	5.7	28.1	17	83
	Calum	45	71.8	14.5	57.3	20	80
	Clara	26	38.7	7.8	30.8	20	80
	David	38	59.4	11.5	47.9	19	81
	Gill	31	51.6	13.3	38.3	26	74
	Luke	16	37.0	13.0	24.0	35	65
Total	Mean	27.3	49.6	22.1	27.5	45	55
1		26.3	50.8	39.3	11.6	**77**	**23**
2		28.0	48.7	11.1	37.6	**23**	**77**

Comparison of the percentage of CLPL time spent on school related/directed CLPL and personal CLPL

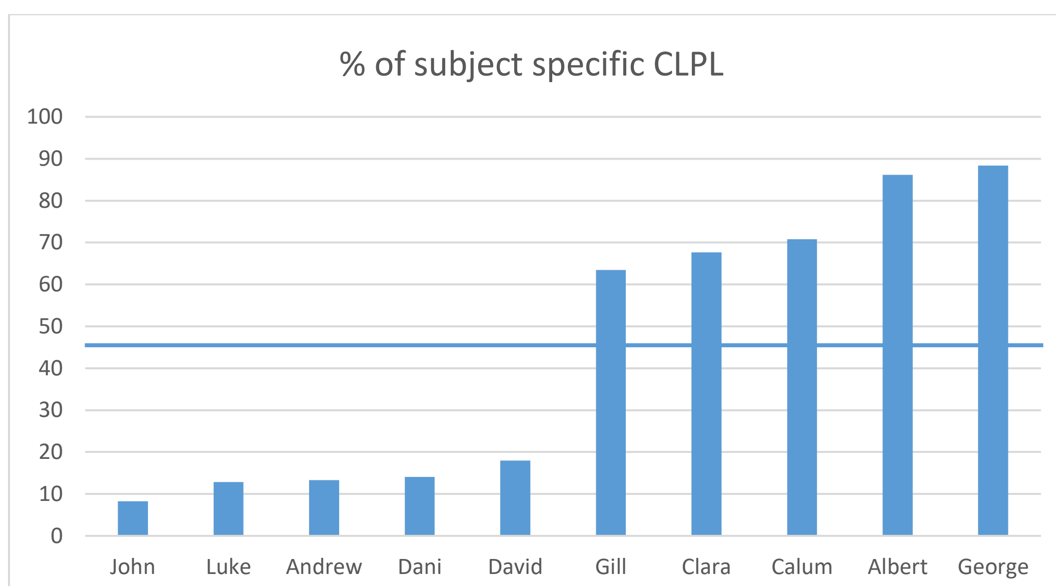


Notes:
[1] CLPL conducted on school-based or school-directed CLPL and mostly during teachers' Working Time Agreement (WTA) such as on in-service days, collegiate time, or during release from teaching.
[2] CLPL conducted during teachers' own time, and which might be expected to count towards teachers' personal entitlement to 35 hours of CLPL per year.
[3] Illness prevented Andrew undertaking personal CLPL outwith school working hours, including masters-level study, for part of the year. This figure is therefore lower than had been expected.
[4] Neal and Ava would very likely belong to this subgroup based on both their partially completed diary-logs and comments during interviews.

Appendix 15

Summary of diary-log entries of teacher participants – subject-specific professional learning

Teacher	Subject-specific CLPL/minutes[1]	Total CLPL/minutes	Subject-specific CLPL %
John	132	1602	8
Luke	285	2219	13
Andrew	420	3160	13
Dani	570	4045	14
David	639	3562	18
Gill	2060	3245	63
Clara	1975	2920	68
Calum	2910	4110	71
Albert	1745	2025	86
George	3300	3735	88
Total	14036	30623	46



Five of the teachers spent a small minority (mean 13%) of their CLPL time on subject-specific CLPL but five spent the majority (mean 75%) of their CLPL time on subject-specific CLPL. This classification does not correlate exactly with the two groups reported in appendix 14, however, John, Andrew, and Dani who all participated in substantial whole-school programmes of CLPL all fall in the former group.

Notes:

[1] All entries in diary-logs were coded as subject-specific or generic using professional judgement based on the participant self-reported diary-log entries and additional information provided by participants during interviews.