TEACHER PROFESSIONAL DEVELOPMENT IN ASSESSMENT:

PEDAGOGIES IN THE ASYNCHRONOUS LEARNING ENVIRONMENT

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List of Acronyms

AfL	Assessment for Learning
ALI	Assessment Learning Instrument
AoL	Assessment of Learning
CK	Content Knowledge
CoI	Community of Inquiry
CON	Congruence Tracing
COV	Covariational Analysis
CPT	Causal Process Tracing
CR	Critical Realism
CT	Complexity Theory
DES	Department of Education and Science
ESSA	Every Child Succeeds Act
FB	Feedback
INSET	In-service Education and Training
INTO	Irish National Teachers' Organisation
ITE	Initial Teacher Education
LBKO	Learning through Building Knowledge with Others
LBT	Learning by being taught
LIS	Learning is Individual Sense Making
LISC	Learning Intentions and Success Criteria
MTP	Master of Teaching Programme
NAPLAN	National Assessment Programme Literacy and Numeracy
NCCA	National Council of Curriculum, and Assessment
OECD	Organisation for Economic Co-Operation and Development
PASA	Peer-Assessment Self-Assessment
PCK	Pedagogical Content Knowledge
PD	Professional Development
PIRLS	Progress in International Reading and Literacy
PISA	Programme for International Student Assessment
PPAT	Personal Practice Assessment Theory
QD	Question and Discussion
SC	Summer Course
TC	Teaching Council
TIMSS	Trends in International Maths and Science Study
TP	

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Abstract

Teacher Professional Development in Assessment: Pedagogies in the Asynchronous Learning Environment

BA Collins

Strong assessment knowledge and competency in using assessment is a key professional requirement for teachers. This doctoral study examines the pedagogical processes that bring about teacher learning in assessment during asynchronous online professional development. The study also focusses upon the impact of an asynchronous online learning environment on teacher learning in assessment.

Teacher learning is a complex phenomenon and this study is framed by the theoretical perspectives of complexity theory (Opfer & Pedder, 2011) and critical realism (Bhaskar, 1978, 1997). Complexity theory (Opfer & Pedder, 2011) takes the stance that teacher learning involves multiple interactions influenced by factors from the teacher's personal domain, the school environment and the wider societal and policy spheres. Critical realism holds that causative mechanisms result in observed outcomes, such as teacher learning. The study is also underpinned by the explanatory case study approach, specifically causal process tracing (Blatter & Haverland, 2014) in order to identify which combination of conditions make an outcome possible and which underlying mechanism effectively create an outcome. Data were gathered during a five-module asynchronous online professional development activity. Sources of data included reflective tasks, forum contributions, field notes and participant questionnaires. Follow-up data were also collected when participants returned to school.

The study contains reviews of literature in the areas of teacher assessment literacy, assessment theory, teacher professional development, teacher learning and teacher agency and identity. These reviews highlight the pertinent issues from each area.

This study is significant as the data is collected during an authentic asynchronous professional development activity in assessment and contributes to the knowledge base both in the pedagogical processes that result in learning and the impact of the asynchronous learning environment on teacher learning. It is also significant as asynchronous online learning is a widely used method of professional development. The study highlights the importance of the process of engaging in quality reflective tasks and the use of specific assessment approaches during asynchronous professional development. In addition, the study explores the role of participant teaching experience in their own learning as teachers. Finally, the study outlines implications for policy, practice and future research in the area of assessment literacy and asynchronous online learning.

Chapter - One Introduction

1.1 Introduction

Studies have established significant gains in student achievement, metacognition and motivation for learning, when teachers integrate assessment with their instruction (Black and Wiliam 1998; Earl 2003; Gardner 2006; Willis 2010). Such outcomes, however, are dependent upon the assessment skill base of the teacher. As Stiggins (2010) argues "Students' achievement is strongly related to their teacher's ability to develop or select high-quality classroom assessments and then to use them productively to support learning – not merely grade it" (p. 233). Teachers are expected to engage in high quality assessment practices to gather data and make decisions about student learning to guide further instruction (Livingston & Hutchinson, 2016). Many national and state teaching standards express this expectation explicitly and regard the assessment capacity of the classroom teacher as a core professional competence (DeLuca, LaPointe-McEwan & Luhanga, 2015). Skill in assessment also allows teachers to mediate the increasing politicisation of assessment (De Luca & Johnson, 2017). Such skill also allows teachers to mediate the psychometric cultural legacy that is a feature of many education systems (Ellwood & Murphy, 2015). However, little mention is made of how teachers themselves engage in learning to develop assessment capacity and how deep and effective teacher learning in assessment can be achieved. A source of teacher learning in assessment is professional development. In an Irish context the only professional development

activity in assessment, widely available to all teachers is in the interactive, asynchronous online[1] space.

This study examines a professional development activity for teachers in the assessment of reading, writing and oral language in the classroom. The professional development is an interactive asynchronous online activity. Data were collected during the five modules of the online professional development activity. In addition, data were collected when participants returned to the classroom. The data were gathered from online forums, learning journals reflective coursework and using three online questionnaires (Appendices A1, C and D). Table 1.1 provides a brief summary of the data collected during the study.

Table 1.1: Data Sources

Data Source	Point of Collection
Facilitator Fieldnotes	Continuously from the course planning up until classroom implementation of teacher learning.
Five Forum Contributions from each participant.	One contribution per module.
Five tasks: planning for teaching and assessment from each participant.	One task per module
Five reflective tasks per participant.	One reflective task per module.
One external reflective task per participant.	At the end of module five.
One external reflection report.	Received by facilitator/researcher following module five.
Three questionnaires (All participants completed questionnaire one and two as these were required for course completion; ten participants completed questionnaire three which was optional)	Questionnaire 1: At the beginning of module one. Questionnaire 2: Following module five. Questionnaire 3: On return to the classroom to apply new learning.
Online discussion chat box.	Module 4

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[1] Interactive asynchronous online professional development is defined by Means et al. (2010) as an online activity with a time lag between the presentation of instructional stimuli and student responses with interaction between students, between facilitator and students and between students and course content.

Forty-nine participants took part in the professional development activity, of which forty-seven agreed to participate in the study. Ten participants took part in the follow-up data collection on returning to the classroom in the Autumn.

Interactive asynchronous professional development is undertaken by ten thousand teachers annually in Ireland as part of Summer professional development provision (Drumcondra Education Centre, personal communication, July 2017). In an Irish context, this approach to professional development is accessible to all serving teachers and under current policy is widely used and incentivised for primary school teachers. This study, concentrates on gaining insight into, and understanding the means through which teachers learn about assessment or develop assessment capacity in an interactive asynchronous online setting. In this chapter, the policy context both national and international in which assessment occurs is examined. Challenges and tensions arising from assessment approaches combined with national and international policy in assessment are outlined. In addition, research design is explored with a focus on phenomenology as philosophy rather than a methodology and the explanatory case study approach.

1.2 Teacher Learning in Assessment: Developing Assessment Capacity
Understanding the processes through which teachers learn about teaching, and drawing on the work of teacher educators (Loughran, 1997, 2006, 2007; Berry, 2004; Korthagen, 2010), this study gives insight as to how teachers learn about assessment during interactive asynchronous professional development. In particular, the study identifies the pedagogies that are effective in bringing about teacher learning. Teacher learning in assessment can occur in a range of contexts. In the first instance, learning can be influenced by teachers' own experiences as learners in school settings. Prior experience of schooling as source of teacher learning has been named as a challenge

of teacher education (Darling-Hammond, 2006; Loughran, 2006; Berry, 2004). Identified by Lortie (1975) as amounting to an "apprenticeship of observation" the beliefs and assumptions about teaching and learning in general picked up in the classroom and school context can be resistant to change and may persist as beliefs about teaching beyond graduation (Westrick & Morris, 2015). The same influence of prior experience, it can be argued, applies to teacher learning in the area of assessment. Critically exploring and deconstructing previous experience is now recognised as a key part of learning to teach in the context of Initial Teacher Education (ITE). Teacher education at ITE or pre-service level provides teacher candidates with some knowledge of assessment, but many candidates feel unprepared for the challenges of classroom life (Mertler & Campbell, 2005). Teachers can also develop "on the job" from classroom practice.

Professional development can offer teachers the opportunity to enhance their learning about assessment. Research in the areas of both teacher education and professional development identify pedagogy as the main factor influencing teacher learning (Loughran, 2007, Timperley, Wilson, Barrar & Fung; 2007). This thesis focuses upon the pedagogical approaches used by the facilitator-researcher during interactive asynchronous professional development. The study sets out to answer two research questions:

1. What are the pedagogical approaches that best support teacher learning in assessment during interactive asynchronous online professional development in classroom assessment in literacy?

2. What is the impact of the interactive asynchronous learning environment on teacher learning?

However, before these questions can be answered it important to examine the current policy context of assessment as policy influences the teaching environment in which teachers operate. Policy can also influence practice and Wiliam (2010), a key theorist in assessment, has noted that many teachers now teach and learn in education systems which feature mandated standardised testing as policy. The following section explores some of the themes arising from such a policy context.

1.3 Policy Spaces: The Global Landscape, Emerging Themes

The use of national regimes of standardised testing is evident in major education systems (Volante & Earl, 2016) and indeed Rizivi & Lingard (2010) argue it has become the foremost steering mechanism of school systems.

1.3.1 Outcomes of High Stakes Testing Regimes

Standardised testing is now the central tool used for educational reform in the United States (Au, 2011). In the United Kingdom, many parents, teachers and head teachers are questioning the "testing treadmill of primary education" commenting that schools have become bureaucratic places of joyless learning with literacy and numeracy taking precedence over all other subjects (Rose, 2016). Meanwhile the National Assessment Programme – Literacy and Numeracy (NAPLAN) in Australia has resulted in a shift in perception of what is valued in teachers resulting in school practices dominated by "the logic of enumeration" (Hardy, 2015). Building relationships, using quality pedagogies and caring have been superseded by the ability to achieve high test scores. Such a shift in the desirable qualities of a teacher, has resulted in data manipulation by some Australian teachers, with a view to avoiding punitive treatment for their school. Thompson & Cook (2014) believe that although the data manipulation is regrettable, it is nonetheless a logical outcome of a punitive

and powerful testing regime. Hardy (2015) also argues that even without the threat of

punitive measures and unachievable targets, as was observed in Queensland, schools

have become sites for testing rather than sites for thinking and learning. He states

teachers

> are actively produced by and productive of a field of schooling
> practices which is deeply influenced by teacher and student
> learning practices focused upon how to improve students' results
> on standardised national tests, and within which improved
> NAPLAN results are capitals which are highly valued (p. 359).

In addition, as Trumbull & Lash (2013) have observed, even though all students are

tested the tests are not intended to identify individual student learning needs but serve

as a method of

> counting the number of individuals who meet grade-level
> standards; test results of individual students are aggregated into
> reports of school and district progress, reports that are useful for
> district- and state-level decision-makers. But while such tests may
> identify students who lack the knowledge and skills expected for
> their grade level, these achievement tests do not identify why
> students are not proficient; the tests are not linked closely enough
> to classroom instruction and curriculum to identify what
> misconceptions students hold or what skills they are missing,
> information that could help guide instruction. (p.1)

Teachers and students are subject to the influence of testing regimes regardless of

whether they are high-stakes. Overall, critics of testing regimes argue test outcomes as

aggregated data are given capital status while relationships, caring and quality

pedagogy are side-lined. The individual student learning need does not appear to have

any importance.

1.3.2 Questioning the High Stakes Testing

Nonetheless, despite the dominance of standardised testing, a shift in thinking

is emerging and questions are being posed about the validity of the data generated

from national testing regimes. In the US, the Obama administration had moved from

the use of standardised test data as the main driver for reform and assessment practice with the introduction of Every Child Succeeds Act (ESSA, 2015). Assessments now involve several sources of data such as portfolios, projects or extended performance tasks, alongside testing in reading and mathematics from grade three to grade eight. Australian educators have indeed questioned the validity of relying on data influenced by factors beyond the control of schools (Klenowski & Wyatt-Smith, 2012). In an Irish context, a wide range of classroom assessment approaches is advocated in policy (DES, 2011; TC 2011) but the only mandated form of assessment is standardised test data. Assessment policy in Ireland also offers little in the way of a clear articulation of the purpose and theoretical underpinning of assessment approaches and their links to learning theory (Sheehan, 2016). Lysaght & O'Leary (2017) argue that the dominance of standardised test data is further compounded by the lack of reference to alternative methods of assessment in the recently published *Action Plan for Education* (DES, 2017). The plan states that there will be revised/new literacy and numeracy targets based on standardised test data (DES, 2017a). This may suggest the dominance of testing. However, league tables are not published (Hislop, 2011) and no proposed sanctions exist for individual schools; the plan (DES, 2017a) has other goals which include student well-being, competencies, best practice and engaging learners. It can therefore, be argued, Ireland has eluded total dominance of standardised test data being used to judge and punish rather than evaluate and improve teaching and learning. This is apparent from the recent DES directive which appears to allocate resources based on low scores (INTO, 2014). This echoes the Australian desire for the government to recognise the strong link between low standardised test results and socioeconomic status. In addition, a new research project aims to look at the use of

such data to guide literacy and numeracy teaching and the role of teacher knowledge in making the best use of data (O'Leary, June 8, 2016).

Apart from national testing regimes in individual countries, international achievement testing also forms part of the assessment landscape (Volante & Earl, 2016). The validity of large scale, cross country testing data has also been questioned with item response scaling and dimensionality the focus of criticism (Eivers, 2010; Goldstein, 2004). Such achievement tests, that measure student attainment across different countries, prompt responses from policy makers when data comparison is carried out. The OECD's PISA[2], TIMMS[3] and Progress in International Reading Literacy Study[4] (PIRLS)(IAEE) have all prompted policy reform at national level (Conway & Murphy, 2013; Looney, 2016; Sheehan, 2016). However, Ozga (2012) has argued that PISA data is not transferrable from one context to another because each result is gathered from a different teaching and learning context. Many of these tests have now become low-stakes for the schools and individuals taking the test, but are high-stakes for politicians, policy makers and governments (Stobart & Eggen, 2012). Neumann (2016) argues that only strong teacher knowledge and beliefs in assessment can counter the negative effects of mandated standardised testing policies. Professional development is a way of fostering knowledge and beliefs in assessment

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[2] All OECD member countries participated in the first three Programme for International Student Assessment(PISA) surveys, along with certain partner countries and economies. In total, 43 countries took part in PISA 2000, 41 in PISA 2003, 58 in PISA 2006 and 74 in PISA 2009.

[3] Trends in International Maths & Science Study (TIMSS) regular international comparative tests in maths and science. Since 1995, TIMSS has monitored trends in mathematics and science achievement every four years, at the fourth and eighth grades. TIMSS 2015 was the sixth such assessment, providing 20 years of trends.

[4] PIRLS 2016 is the fourth assessment in the current trend series, following PIRLS 2001, 2006, and 2011. There were 61 participants in PIRLS 2016, including 50 countries and 11 benchmarking entities. For countries that have participated in previous assessments since 2001, the PIRLS 2016 results provide an opportunity to evaluate progress in reading achievement across four time points: 2001, 2006, 2011, and 2016.

(Shepard, 2000; Stiggins, 2010). It can therefore be argued, that without professional development teachers will become overly influenced by testing at national and international level rather than by a broad approach to assessment that extends beyond test administration. Without quality professional development, teachers are also unlikely to be able to critically evaluate assessment practices dictated by policy and in turn use appropriate assessment methods for their own students.

Understanding and using appropriate assessment approaches has never been more important than now because of the emphasis on assessment-based reforms in education (Hopfenbeck, 2015; Koch & DeLuca, 2012; Andrade & Cizek, 2010). Darling-Hammond (2011), comments that the assessment-based reform discourse is a shared international experience. Furthermore, Willis, Adie & Klenowski (2013) argue that the prominence of the assessment reform agenda should prompt educators to revisit the concepts of assessment and assessment capability. They also believe teachers receive messages constantly about assessment from the curriculum and from policy in their own professional context, but teachers need to be afforded the professional space to develop their own learning to have robust assessment capacity and make the best choices for their students' learning.

This section has highlighted the influences exerted upon teachers and teaching contexts by the national and international policy trends in the use of assessment in the classroom and school settings. Skilled use of assessment is a professional requirement for teachers, but teachers also need access to quality learning opportunities to become capable. The following section outlines the rationale for this study.

1.4 Rationale for Choice of Topic

Teachers need to develop robust assessment ability, as they are faced with the challenge of providing assessment opportunities appropriate for student needs.

Stiggins (2014) believes a blind spot has been created with the belief that the only acceptable evidence of student achievement is standardised test data. In addition, if evidence only comes from one teacher and one class without national comparisons it is not trustworthy. However, advancement in assessment practices does not come easily (Clarke, 2014). Even with professional development, teachers who embrace the concept of changing their assessment approach may still exhibit practices that are mechanical and without the active engagement of the students (Antoniou & James, 2014). Without effective professional development in assessment that focuses on deep learning moving beyond learning new strategies teachers will struggle to develop strong assessment skills to support student learning. Professional development is a part of the continuum of teacher education and must take place informed by sound pedagogical principles.

The focus on data driven decision making and teacher accountability is now being questioned and other sources of assessment information are being sought. This change in approach to assessment has made it more important than ever that teachers understand and know how to use assessment effectively to foster student learning rather than merely identify learning or lack of learning. Creating high quality professional development, however, is hampered by the lack of research into pedagogical approaches that support teacher learning in assessment in a professional learning context (Popham, 2004, 2011). De Luca et al. (2013) concluded that future research should enquire into the pedagogical conditions that support effective assessment education for teachers. They also argue that descriptive accounts of how assessment educators operationalise pedagogic constructs in teacher education settings other than university-based ITE are required to develop knowledge of teacher

assessment capacity. This is particularly pertinent in an Irish context. Recently developed policy in the sphere of professional development for teachers has stated explicitly the need for research to underpin future programmes, in conjunction with, the need for professional development opportunities in assessment (TC, 2016). Drawing also on the research from teacher education and professional development, pedagogy is a key indicator of teacher learning (Loughran, 2007, Timperley et al., 2007). This study sets out to address the gap in the research by gaining insight into pedagogies used during assessment education for serving teachers in the context of interactive asynchronous online continuing professional development.

Although student achievement is the ultimate outcome from a research perspective, "teacher outcomes stand for an important proximal outcome for professional development in formative classroom assessment" (Schneider & Randel, 2010, p. 269). Schneider and Randel (2010) believe that research focus on proximal teacher outcomes will promote understanding of processes and mechanisms necessary to effect change in teacher practices and, by extension, student learning. As mentioned earlier Neumann (2016) states that strong knowledge and beliefs in assessment can allow teachers to make the best decisions for their students rather than be driven by policy demands. But as Shepard (2000) and Stiggins (2010) state quality professional development can foster such attributes in teachers. Nonetheless, as Antoniou & James (2014) have argued, mechanistic changes in strategy are not sufficient.

Changes in assessment practice also need to be accompanied by a change in the thinking around teacher accountability that extends beyond high test scores. Teacher accountability is narrowly conceptualised and rests on the assumption that instructional decisions can only be made from data based on student performance on

standardised tests (Newman & Newman, 2012). Furthermore, many parents, teachers and administrators are persuaded that reform means placing the test score as the most important outcome of schooling (Ravitch, 2013) and a measure of teacher efficacy (Thompson & Cooke, 2014). Although the results may be representative of how students performed on a specific test, they do not offer a true picture of what has been accomplished academically in the classroom. In addition, the data on student achievement is frequently used for ranking purposes in isolation from student learning and teacher instruction. Therefore, teachers need to develop skills to think and act critically about assessment in the classroom environment, and make decisions in the interest of students while operating in a policy environment where standardised testing features prominently (Brookhart, 2011). Quality assessment skills can only be achieved through targeted and relevant professional development events that help teachers assess and develop their own assessment capacity. Enhancing assessment is characterised by more than a change in strategy, change in beliefs about assessment and a change in knowledge of assessment is also required.

1.5 Research Context

This research is set in the context of a recognition at state level of shortcomings in classroom practices in formative assessment (DES, 2016) alongside a questioning of the dominance of standardised data in determining achievement. The need for research into quality professional development opportunities in assessment also forms part of the context. (TC, 2016). The prevalence of interactive asynchronous online professional development in an Irish context, is also a notable part of the research setting.

Participants were enrolled in a university led, interactive asynchronous online course in classroom assessment of reading, writing and oral language. The course required a minimum of twenty hours "meaningful engagement", ten of which were required to be online (DES, 2017b). The professional development activity consisted of five modules dealing with the key areas of formative assessment in the teaching of reading, writing and oral language in a classroom context. The modules included key academic readings about research and philosophical underpinnings in formative assessment alongside explanations and applications of sharing the learning intentions and success criteria, questioning, feedback, and peer- and self-assessment in the teaching of literacy. The course was available online for two periods of two weeks; one period in July and the second in August. The professional development activity was delivered simultaneously to two separate student cohorts.

During the two-week period, the participants engaged in assessments of their own classroom practice in formative assessment, completed reflective assignments based on professional readings, podcasts, videos, curriculum documents and work samples. The assignments consisted of reflective writing and planning for future implementation of formative assessment strategies for participants in their own professional context. The facilitator-researcher provided feedback, scaffolded discussion and reflective prompts.

The asynchronous online course was designed and delivered by the facilitator-researcher. A wide variety of technologies was available through the HEI online learning platform LOOP. Some of the technologies included online synchronous meeting facilities, forum activities to facilitate asynchronous discussion, chat activity to facilitate synchronous discussion and the facility to upload videos, PowerPoints and

articles. However, consideration was given to the fact that selections had to facilitate

learning in an asynchronous setting as technology must meet the learning

requirements of each module (Appendix G). Freidhoff (2008) stated that teacher

educators must examine how technology selection facilitates and constrains the

learning outcomes of the courses they teach. Table 1.2 provides a summary of the

technology selected for the professional development activity alongside the rationale

used based on the affordances and constraints of each choice with regard to the

learning outcome.

Table 1.2 Affordances and Constraints of Course Technologies. (Freidhoff, 2008)

Technology	Affordance	Constraint
Forum: the forum setting selected was compulsory posting to discussion topic either set by facilitator-researcher or question ask by participant	The contributions can be monitored by the facilitator-researcher for evidence of learning or lack of evidence of learning. Allows facilitator to assess participant learning. Allows for student to student interaction. Discussion can take place over an extended time in the asynchronous setting.	Students can go off topic so careful monitoring is required.
Chat	Allows for scheduled synchronous discussion of a particular topic over a short time period. Suited to technical or administrative questions. Can stop students from introducing technical and administrative issues into the forum space.	Can lack depth as students may not have enough time to engage with course material.
Journal	Allows for uninterrupted reflective answers. Allows facilitator-researcher to assess learning.	Can take time to challenge or prompt students as reply needs to be by email.
Questionnaire	Allows for closed or open construct type responses. Data can be analysed by question. Students need to answer all questions before they can proceed. This feature enabled the participant to carry out a robust evaluation of their classroom assessment practice.	The format can be a little monotonous.

Quiz	Promotes self-assessment and facilitator assessment of participant learning.	Can be restrictive if answers are descriptive and wording is not exact.
Upload files	Allows facilitator-researcher to create content. Allows facilitator-researcher to upload PowerPoints, videos, research and policy documents. Allows students to access and download content.	Needs to be accompanied by reflective assignment or the level of learning may be limited.
Provide links to web-based materials	Allows students access to web-based material that promotes learning e.g. video clips of assessment techniques.	Needs reflective task to deepen learning.

There was a total of forty-seven participants enrolled; thirty-five participants were serving primary-school teachers engaging in a summer professional development activity. Twelve participants were completing the module in classroom assessment for the Master in Teaching Programme.

1.6 The Researcher

To maintain credibility as a researcher and avoid anything which may have affected the validity and reliability of my work it was important to explore my position as a teacher educator and course facilitator-researcher. Creswell (2009) argues that all research is positioned. Therefore, the researcher has an obligation to be reflexive and acknowledge all biases and assumptions. From an ethical point of view, it was important to establish trust and transparency (Ma, 2016). The researcher has been working as a full-time primary school teacher for the past twenty-eight years. In addition, the researcher has held the position of Adjunct Lecturer in Assessment in the Education Department of a university for six years. The post of Adjunct Lecturer requires design, delivery and evaluation of courses in classroom assessment up to Master of Education level. The researcher is also responsible for the provision of in-service education in classroom assessment. Duties include research supervision. These

experiences have provided the researcher with skills and knowledge in the area of teacher education both as a facilitator-researcher and course designer. Nonetheless, the literature on teacher educators indicates that a classroom teacher transitioning into teacher education faces challenges (Williams, Ritter & Bullock, 2012; Wood & Borg, 2010; Murray & Male, 2005). A key challenge identified is the need to adjust the pedagogy used in the classroom to suit a teacher education context. However, Loughran (2014) suggests that entering teacher education should be viewed as an opportunity to develop pedagogy and an essential part of becoming an effective teacher educator. This view is also supported by Berry (2008) who identifies examining practice as a way of developing quality pedagogy. It would seem to me as researcher that transitioning to teacher education comes with a professional obligation to investigate my own practice and add to the knowledge of practice of pedagogy for teacher educators. Investigating practice however, is not without challenges. Some of these challenges include the fear of perhaps affecting the professional development provision or discovering ineffective practice.

In the context of this study, the researcher is also the course facilitator-researcher-researcher for the interactive asynchronous online professional development activity in assessment. This place the researcher in the position of an insider researcher. The insider-researcher conducts research about home communities such as one's profession, workplace society or culture and has privileged knowledge about these locations (Labaree, 2002). Conducting research from the position of an insider researcher raises ethical and methodological challenges and these will be examined in more detail in the methodology chapter.

1.7 Research Design

The following section outlines the key concepts that underpin the research design of this study. These include the use of phenomenology as a methodological philosophy rather than a discrete method. The role of the explanatory case study research method and causal process tracing is also discussed.

1.7.1 Phenomenology as a Philosophy

Given the social and complex nature of teaching and learning (Opfer and Pedder, 2011), varied outcomes of in-service learning for teachers (Tang, 2010) and the insider position of the researcher, a research perspective based on a phenomenological approach (Lincoln & Guba, 1985) may be best suited. Such an approach "focuses on people's subjective experiences and interpretations of the world" (Trochim & Donnelly, 2008, p. 180). Creswell (2009) maintains the tradition emphasises the study of how a phenomenon is experienced by research participants and that phenomenology is regarded as both a philosophy and a method. Trochim and Donnelly (2008) highlight the fact that phenomenology is characterised by the emphasis on maintaining the meaning of original verbalisations of the participants. This is pertinent as the data collected from this study consists of original contributions by participants as part of an online professional development course. Cohen, Mannion & Morrison, (2011) argue that by adopting a phenomenological stance the researcher can preserve the integrity of the situation in which they are researching and reduces the influence of the researcher over the situation. Such a stance is suited to this study as the context is a professional learning activity for serving teachers and data were collected from actual course contributions and learning situations facilitated by the researcher. Maykut & Moorehouse (1994) advocate a philosophy underpinned by phenomenology when the knower and the known are interdependent and values

mediate and shape what is understood. This is particularly pertinent in this study as teacher beliefs and value systems around assessment impact upon learning and classroom practice (De Luca & Johnson, 2017).

1.7.2 Explanatory Case Study as a Method

The use of the explanatory case study approach builds upon the adoption of a phenomenological stance. Sato, Fisette & Walton (2013) argued the explanatory case study design was best suited to understand and explain a complex educational or social phenomenon. Furthermore, Yin (2009) contends that the explanatory case study method preserves the holistic detail of the real-world setting. In particular, the explanatory case study method selected for this study is the Causal Process Tracing (CPT) type of explanatory case study (Blatter & Haverland, 2014). Such a method suits research focussing on questions such as what makes the outcome possible. In this study, the outcome is teacher learning in assessment. CPT sets out to reveal time-based interplay among conditions or mechanisms that lead to specific outcomes. Explicit classification of the three types of explanatory case study are discussed in more detail in Chapter Three.

1.8 Outline of the Study

The concept of teacher learning in assessment in an interactive asynchronous online setting is explored and located within the wider landscape of debate on assessment approaches alongside the area of online pedagogies and professional development. The chapter then discusses the underlying philosophical approach that has informed the study. The position of the researcher within the study is also discussed. The research design and study layout are also included in this section. This is followed by a critical analysis of relevant literature in Chapter Two, from which

research questions are drawn. The literature review is divided into four broad categories and examines issues in the policy context of assessment, research about assessment in the classroom, teacher learning in assessment and asynchronous learning. Key questions are raised. These include the shift away from a reliance on standardised test data as the dominant source of assessment information, the need for teacher learning in assessment and above all the requirement to better understand the process by which teachers themselves learn to become proficient in assessment. The literature review concludes by focussing the study on the pedagogies best suited to supporting teacher learning through interactive asynchronous online professional development in assessment. Chapter Three describes the methodological approach adopted in the study. Philosophical paradigms are explored, and justifications are established for the choice of underpinning theory. The rationale for selecting an explanatory case study method and in particular causal process tracing is presented. The use of data collection instruments is described. Data analysis, validity, ethical considerations and limitations of the study are also considered in Chapter Three. Following on from the methodological section, Chapter Four sets out the sets out the research findings discussed through the lens of the literature review. Conclusions and recommendations are presented in Chapter Five based upon the researcher's analysis and interpretation of the evidence. These focus upon the discussion of a critical framework for online learning

1.9 Conclusion

The assessment landscape for the classroom teacher today is complex with multiple influences impacting upon everyday assessment practice. Influences include both national and international policy in assessment, school environment and the

classroom teacher's own learning and skill in assessment. In Ireland, from a policy perspective, the dominance of standardised test data as the only source of evidence of student learning, has gained huge traction at local and national level. However, strong assessment capacity in a teacher allows students to benefit from assessment approaches that enhance and monitor individual learning rather than amass aggregated data with no meaning attached to the individual student needs. Teacher assessment capacity however, can only be developed through opportunities for teachers to learn about assessment.

Research exists into the pedagogical approaches that support teacher learning in assessment at preservice teacher education level. However, teacher learning in assessment does not stop at the end of preservice teacher education. Teachers learn about assessment through classroom practice after preservice education but this type of learning about assessment is not complete learning. Complete learning requires professional development. Teachers need professional development opportunities in assessment in order to examine their own assessment practices and experiences, and develop their assessment capacity. Such opportunities are often in the form of interactive asynchronous online learning professional development activities. Many teachers avail of this form of professional development in an Irish context and as policy recognises, research is needed into to the effective processes that bring about teacher learning in the interactive asynchronous online setting.

Chapter 2 - Literature Review

2.1 Introduction

Teaching, learning and assessment are interconnected processes that serve to promote student learning. Strong assessment knowledge and competency in using assessment is a core professional requirement (Xu & Brown, 2016; Livingston & Hutchinson, 2016; DeLuca, LaPointe-McEwan & Luhanga, 2015; Siegel & Wissehr, 2011). A well-developed assessment capacity is a requirement to teach effectively (Popham, 2011; Price, Rust, O'Donovan & Handley, 2012). Such a capacity is also key in helping teachers negotiate the increasingly politicised role of assessment (DeLuca & Johnson, 2017; Elwood & Murphy, 2015). The Organisation for Economic and Co-operative Development (OECD) regard assessment as part of pedagogy for the classroom (OECD, 2013) but are also the drivers behind international testing programmes. Existing research recognises the fundamental part assessment plays in teaching and learning (Black & Wiliam, 1998; Campbell & Collins, 2007; Mertler, 2003; Mertler & Campbell, 2005; Stiggins, 2010; Wiliam, 2011). Key theorist Wiliam (2010), believes the use of assessment allows teachers to establish whether instruction has been successful, as even the best designed course cannot be deemed effective unless assessment of the learning takes place. The knowledge needed by teachers is specialist, and not the same as the knowledge possessed by a subject expert. Teachers need to transform their subject knowledge into learning for students by using their pedagogical content knowledge (PCK) (Shulman, 1986). Knowledge of assessment forms part of an effective teacher's PCK which allows teachers to bring about learning in students. However, it is also important to focus on how teachers learn to become competent assessors in a classroom context. Teacher learning in assessment takes place at pre-service level,

during classroom experience as a teacher and during professional development. This study focuses on teacher learning during professional development. In particular, the work concentrates on the pedagogical approaches used during interactive asynchronous online professional development in classroom assessment.

This chapter reviews the literature on assessment theory, the impact of context on teacher thinking in assessment, and the significant theoretical views on teacher learning. The chapter then goes on to look at the processes that bring about teacher learning in assessment. Finally, aspects of asynchronous online learning are considered given the increase in demand worldwide for quality online learning environments. This is an important aspect of the literature given the proliferation of asynchronous online professional development in Ireland. At the moment, ten thousand teachers undertake asynchronous online professional development activities annually, each summer. Of the ten thousand that undertake asynchronous professional development, many engage in multiple activities (Drumcondra Education Centre, personal communication, July 10, 2017).

Aside from being a core professional requirement, teacher assessment capacity[5] is not static, but develops over time influenced by contextual factors and processes (Xu & Brown, 2016). To reflect this conceptualisation of teacher assessment capacity Xu & Brown (2016) proposed a framework which explains the concept (Fig 2.1). Analysis and synthesis of one hundred studies on teacher assessment literacy was used to draw up the framework.

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[5] In the literature the assessment skill of a teacher is referred to as *teacher assessment capacity* or *teacher assessment literacy*. In order to carry out a review of the literature in the field it is necessary to understand that both terms are used regularly.
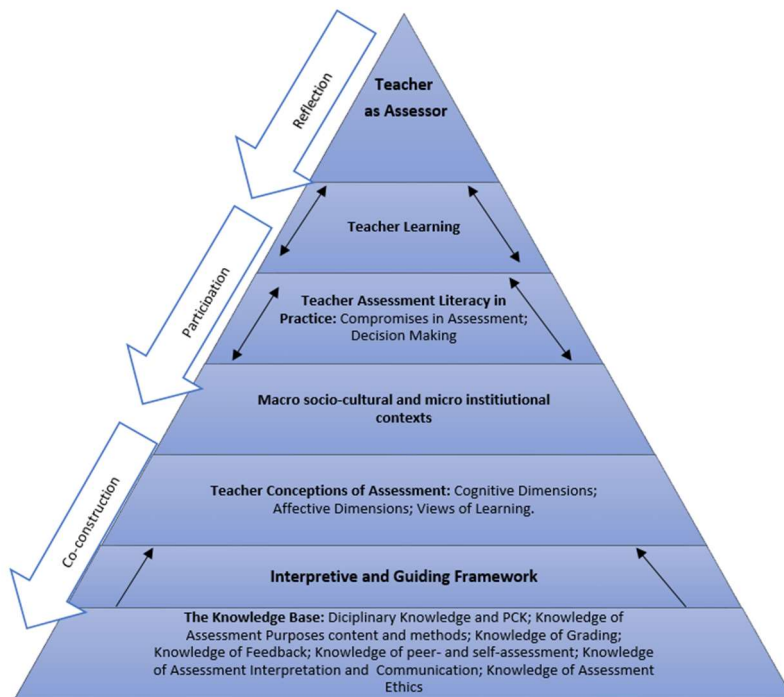
Figure 2.1 *Conceptual Framework of Teacher Assessment Literacy in Practice (Xu & Brown, 2016).*

The framework identifies the constituents of assessment literacy and their

interrelationships. Key factors, such as, teacher knowledge of assessment methods,

assessment principles and knowledge of learning theory act as the guiding framework

for teacher actions in assessment. According to Xu & Brown (2016) teachers develop

as assessors by engaging in the processes of constructing knowledge, participating in

assessment activities in an authentic context and reflecting upon practice. It is also

worth noting that Cowie & Cooper (2017) highlight the specific skill of data literacy

as another dimension to teacher assessment literacy, necessary for teachers to think

critically about assessment. The authors argue data literacy helps teachers identify

assessment challenges and assessment opportunities in their working environment.

Significant student gains occur when assessment is integrated with teaching in

a formative manner or when teachers engage in "responsive teaching" (Cowie & Bell,

2001), but De Luca, Chavez, Bellara & Cao, (2014) concluded that teacher learning in assessment is an overlooked area in the preparation of pre-service teachers. However, teacher learning in assessment extends beyond pre-service or initial teacher education (ITE). Teacher learning in assessment can also happen when teachers engage in professional development during their teaching career (Lysaght & O'Leary, 2017). Teacher professional development is a powerful way to enhance teachers' classroom practices (Desimone, Porter, Garet, Yoon, & Birman, 2002). In addition, teacher learning in assessment can also happen when teachers gain practical classroom experience as they begin to teach. Mertler and Campbell (2005) conducted a comparison study of the assessment literacy of pre-service and in-service teachers. They concluded that in-service teachers achieved higher scores than pre-service teachers on the Assessment Literacy Inventory (ALI) (Mertler & Campbell, 2005). They also stated that teachers learn more about assessment from practical experiences in the school setting than from teacher education programmes. However, learning from classroom experience is a limited method of teacher learning.

The teacher learning in assessment that takes place in a school setting, it can be argued, is only partial learning and indeed may lead teachers to the belief that teacher learning requires no theoretical input, no reflection upon practice or no questioning of received narratives. In fact, Korthagen (2012), a prominent teacher education theorist, has cautioned against viewing teacher learning exclusively as either practical experience or a process of socialisation into existing practice. In addition, he has suggested that this exclusively practice-based approach to teacher learning, can be seductive to teachers, politicians and parents but proposes that teacher experience needs to be situated in structured reflection events in order for

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quality teacher learning to happen. In his analysis of the teacher learning process, Korthagen (2012), says that reflection events should draw upon current theory and research and thus provide deep learning for the teacher rather than superficial mastery of routines and techniques. Such a stance is in keeping with the view of Loughran (2007), who states that teachers need to see beyond the superficial routines and to engage with practice in more nuanced and complex ways in order to learn. Furthermore, Berry (2008), states that teachers need mirrors that allow them to examine their own practice and experience. Apart from practical experience, Kosnik (2007), argues that watching others model practice must be accompanied by a narrative that demonstrates the complexity and challenge of learning as a teacher and also prompts reflection.

Together, studies mentioned above, offer insight into teacher learning in general and suggest that an exclusive reliance on practical experience does not result in quality learning. When learning about assessment, teachers therefore need opportunities to reflect, examine their experience and classroom practice and move beyond superficial mastery of routines. Professional development offers this opportunity for deeper learning. However, provision of professional development without proper pedagogical foundations is ineffective. Once again drawing on the literature from teacher education, Loughran (2007), argues that pedagogical processes are the key factor that bring about teacher learning. In addition, a key tertiary meta-analysis conducted around professional development for serving teachers by Timperley et al. (2007), reports that pedagogy is the key predictor of successful professional development. They have defined pedagogy as the activities and processes that result in teacher learning. However, theory and knowledge of assessment theory

are features of teacher learning in assessment. The following section reviews the current thinking theories in assessment.

2.2 Assessment Theory

Broadly speaking there are two principal classroom assessment approaches namely, summative assessment and formative assessment. Each approach takes place, at a different point in the learning timeframe and each approach has distinct purposes. Understanding purpose is a key part of the assessment knowledge and theory that acts as a guiding framework for teacher practice in assessment (Xu & Brown, 2015; Rindone & McQuarrie, 2010).

2.2.1 Summative Assessment

Summative assessment involves assessing learning at the end of a given timeframe of learning, such as the end of a unit of work over a week, a term or a year (NCCA, 2007; Gardner, 2006; Brookhart, 2011). This type of assessment may be in the form of a grade or a score derived from a teacher made test, state examination or commercially produced standardised test administered in the classroom as part of local, regional, national or international testing policy.

There are three significant and inter-related purposes associated with summative assessment. The first purpose can be reporting student achievement to a parent or other stakeholder. The second purpose of summative assessment can be the evaluation of the student or the schooling provided to the student. Thirdly, summative assessment can be used for accountability purposes to parents, school administrators or regional and national government. This third purpose, it can be argued, is the one that bears the greatest impact on teachers and students and as a purpose is the most variable. Accountability, Ball (2013), states "employs judgements, comparisons and

displays as a means of control, attrition and change" (p.57). The summative

assessment information gathered can be used to make a judgement about student

competence or programme effectiveness (Chappuis, Stiggins, Chappuis & Arter,

2012). There are those who believe the quality of schooling provided can also be

evaluated effectively using summative assessment data gathered using standardised

testing from classroom to national level (Wiliam, 2010). Such accountability takes

place both at international and national level drawing on the same data. International

comparisons and evaluations of schooling can be made using summative assessment

data derived from summative test instruments such as the Programme for

International Student Assessment (PISA). Koch & DeLuca (2012), argue that such

summative assessment then becomes high stakes testing and disconnected from

learning in the classroom at national and local level; at local level, the resulting data

from international tests are used to determine grade promotion, grant admission to

higher education, award teacher merit pay and the allocation of resources to schools.

Koch & DeLuca (2012), also argue that as the policy context changes so too does the

validation and interpretation of the purpose of the use of large-scale standardised

testing programmes and conclude by suggesting that all large-scale testing

programmes should be accompanied by a narrative case description of validation in

order to explain clearly the purposes as understood by stakeholders and policy makers

alongside assumptions about testing, learning and teaching.

2.2.2 Formative Assessment

In contrast to summative appraisal, any assessment carried out underpinned by

a formative philosophy develops a continuous cycle of teaching, learning and

assessment. Formative assessment or assessment for learning (AfL) happens at a

separate point in the learning cycle to summative assessment and for different

purposes. In addition, formative assessment focuses upon the context and process of

learning and has significant advantages over standardised testing used purely for

summative purposes, in that it can assess more complex aspects of learning. As

Collins (2015), concluded during a study on the use of formative assessment in a

sociocultural learning environment, formative assessment results in a positive change

in the learning environment, authentic language use, unplanned and un-prompted

peer- and self-assessment. Clark (2012), in a review of 199 sources of formative

assessment research argues that a growing number of administrators at national, state,

and district level have "discovered the potential of formative assessment to make

thinking processes transparent" (p.241). Clark also states that formative assessment it

is now accepted in the research literature as one of the most potent ways to enhance

student motivation and achievement.

Several definitions of formative assessment exist. One of the key definitions of

formative assessment is that developed by Black & Wiliam (1998), which describes

formative assessment "as encompassing all those activities undertaken by teacher,

and/or students which provide information for feedback to modify teaching and

learning activities in which they are engaged" (p.7). A more comprehensive definition

was developed by Black & Wiliam (2009), which proposed that assessment is

formative:

> to the extent that evidence about student achievement is elicited,
> interpreted, and used by teacher, learners or their peers, to make
> decisions about the next stage in instruction that are likely to be
> better or better founded, than the decisions they would have taken
> in the absence of the evidence that was elicited (p.6).

It is notable that the new definition of formative assessment does not stipulate a

modification in teaching or learning but states that the decision taken is a better

decision for teaching and learning then would have occurred without the assessment information. In addition, Wiliam (2010), identifies the five key instructional processes that characterise formative assessment in his new theory of formative assessment. These key processes include:

1. Clarifying, sharing and understanding learning intentions and success criteria

2. Engineering effective classroom discussion, questions and tasks that elicit learning

3. Providing feedback to help the learner move their learning forward

4. Activating students as owners of their learning.

5. Activating students as instructional resources for their own learning.

Moreover, Wiliam (2010), argues that these instructional processes are lens through which teachers can examine their own practice. Klenowski (2009), positions Assessment for Learning (AfL) as "part of everyday practice by students, teachers and peers that seeks, reflects upon and responds to information from dialogue, demonstration and observation in ways that enhance on-going learning" (p. 264).

The centrality of the student to the process of AfL and the nature of the student-teacher partnership that underpins practice in the area is commented on by several theorists. Stiggins (2005), for example, conceptualises formative assessment as student centred assessment underpinned by the idea that the student is motivated by intrinsic factors rather than by external evaluations such as grades, rewards or punishment. This view is supported by Cizek (2010), who fore-grounds the learner-teacher partnership at the heart of AfL describing it as a collaborative process engaged in by educators and students for the purpose of understanding student learning and

conceptual organisation, identifying strengths, diagnosing weakness, recognising areas for improvement and information that teachers can use in instructional planning to deepen understanding and improve student achievement. In a similar vein, Shepard (2006), presented formative assessment as a tool for helping to guide student learning and as a tool to provide the teacher with information to use to improve their own instructional practice.

Achievement has also been impacted upon using formative assessment. In a meta-analysis of research conducted on formative assessment, gains in student achievement consisting of typical effect sizes of between 0.4 and 0.7 were reported when formative assessment was used during teaching of mathematics, literacy and science from primary through to university (Black & Wiliam, 1998). An achievement gain of 0.4 to 0.7 translates to an increase of 15 to 25 percentile points on commonly used standardised test scores (Chappuis et al., 2012). Shute (2008), suggests that typical effect sizes were in the region of 0.4 to 0.8. While Hattie & Temperley's (2007), meta-analysis of the effects of formative feedback found an average effect size of 0.95 standard deviations across 4,157 studies. While these analyses may appear compelling much criticism has been levelled at the use of meta-analysis as a method of evaluating the effect of formative assessment and in particular the much-cited quantitative effect size of 0.4 and 0.7 standard deviations; as Bennett (2009), pointed out, more responsible representations of the benefits of formative assessment should be used.

Indeed, Wiliam (2010), himself gives two reasons against relying on standardised effect sizes as the principal indicator of the impact of formative assessment. The first point of caution raised is that the effect size is influenced by the

range of achievement in the population. The greater the range of achievement in the population, the higher the standard deviation overall, so therefore an effect size is smaller. However, if the range of achievement the population is reduced i.e. student achievement is not as spread out, then the standard deviation is lower. Consequently, an effect size is always a proportion of the standard deviation. This makes effect sizes difficult to compare and aggregate. The second note of warning sounded by Wiliam (2010), is that meta-analytic reviews do not consider that different outcome measures are not equally sensitive to instruction. Bennett (2011), also casts doubt on the use of metric data to support the claim for the effectiveness of formative assessment. He argues that the original Black & Wiliam (1998), study was more of a qualitative synthesis than a statistical meta-analysis. In addition, he states that the original studies which formed part of the review, were too diverse to be combined and summarised by a single effect size statistic and that the studies (Rodriguez, 2004; Nyquist, 2003; Bloom, 1984) do not appear to be as explicitly supportive of formative assessment as it is made to sound.

It is interesting then to note that both Wiliam (2010), and Bennett (2011), argue that the learning conditions and the learning processes of formative assessment are of more importance that the statistically measured effect size of combined studies. Torrance (2012), questions whether test scores should be used at all as a method of validating the effectiveness of formative assessment. He argues that an increase in test scores, when formative assessment is implemented, is the result of formative assessment being used for the purpose of improving test scores rather than for the purpose of the student developing deep understanding and autonomy as a learner.

It can be argued that, while using the test scores should form part of the validation process, the processes by which the improvement was achieved also need to be examined. Furthermore, the test scores cannot be the only outcome to be assessed to establish the validity of the claims made about the effect size of formative assessment. Student understanding, learner autonomy and the learning environment created for the student by the teacher should also be evaluated. It is therefore arguably of importance to provide teachers with the opportunities to develop their own formative assessment skills through teacher education. Strong formative assessment skills build teacher assessment capacity in making student understanding visible, fostering learner autonomy and creating quality learning environments. The work of Kennedy & Shiel (2010), involved raising literacy standards in an urban, disadvantaged school using university led onsite intervention. This study used standardised reading and spelling test scores as part of an on-going focus on formative assessment not just to calculate effect size. The standardised test data were contextualised, with qualitative data on student engagement, student motivation, teacher learning and whole school approaches to the teaching of literacy. The data were used to show the learning and to report progress but not in isolation from the learning process and learning environment.

Assessment practices can be described as either summative assessment, taking place after learning or formative, taking place during learning and providing the teacher with information to plan for the next stage in the learning. The literature cautions against the exclusive use of effect sizes and standardised data as an indicator of successful learning. Evidence of the learning processes, student engagement and learning environment must also feature. Teacher knowledge about assessment

practices can be gained through classroom practice however, there are implications for teacher learning if classroom practice becomes the only source of knowledge in assessment. The next section addresses some of the themes from the literature when teacher professional learning becomes equated only to practical classroom experience. It explores the messages about assessment to which teachers become exposed in the school setting.

2.3 Sources of Teacher Learning

Teachers learn about assessment from sources other than professional development. Some of this learning is recognised and intentional on the other hand some of this learning is unintentional and happens perhaps unknown to the teacher. This learning needs to be acknowledged as when teachers engage in professional development a certain amount of prior learning has occurred.

2.3.1 The Classroom: A Source of Learning

Mertler & Campbell (2005), demonstrated that teacher learning about assessment does indeed take place through classroom practice as a teacher. Building on classroom practice as a source of learning, Willis, Adie & Klenowski (2013), argue that school practices, curriculum and educational policy also serve as sources of teacher learning. Experiences of classroom practices in assessment are shaped by educational policy, in particular, the assessment-based reform policies which dominate education nationally and internationally (De Luca & Johnson, 2017; Hopfenbeck, 2015; Koch & DeLuca, 2012; Andrade & Cizek, 2010). Klenowski (2013), claims that today governments are desirous of information and are driven to implement policy reforms because of the apparent declining scores as reported in

international comparative analyses of achievement data of tests such as PISA[6] and

TIMSS[7]. Governments have responded to "the PISA shock" with centralised

curriculum development and increased testing (Looney, 2016). Teachers then find

their assessment practice shaped by government policy which emphasises test results

as the preeminent approach to assess student learning (McGee & Colby, 2014; De

Luca et al., 2014, Lingard, 2010). Wiliam (2010), has observed that many educational

jurisdictions now have policies with mandated summative assessment in the form of

nationwide standardised testing driven by accountability. Indeed, Elwood & Murphy

(2015), have commented that much of the world's testing systems and testing industry

is underpinned by a powerful psychometric cultural legacy. The cultural legacy has

become so powerful that associated assessment practices, processes and outcomes

have become significant levers able to shift national education policy directions

worldwide either by compulsion or by direct intervention by naming and shaming

those nations not making the grade. If classroom and school practice is influenced by

policy, it would seem appropriate to examine the narrative about assessment implicit

in such policy.

2.3.2 Policy: A Source of Teacher Learning

Accountability policies, influenced by the drive to increase test scores both

nationally and internationally convey a cogent message to teachers and the public

about assessment. The message can be interpreted as assessment equates to taking

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[6] All OECD member countries participated in the first three Programme for International Student Assessment(PISA) surveys, along with certain partner countries and economies. In total, 43 countries took part in PISA 2000, 41 in PISA 2003, 58 in PISA 2006 and 74 in PISA 2009.
[7] Trends in International Maths & Science Study (TIMSS) regular international comparative tests in maths and science. Since 1995, TIMSS has monitored trends in mathematics and science achievement every four years, at the fourth and eighth grades. TIMSS 2015 was the sixth such assessment, providing 20 years of trends.

tests and good teaching equates to having the competence as a teacher to raise those scores. Indeed, Cochran-Smith & Lytle (2009), have argued that test scores have become the synecdoche for learning.

2.3.3 Standardised Testing is all that Matters?

The policy of mandated summative assessment Gardner (2010), notes, has now created a situation, where schools are forced continuously to improve standardised test results and consequently the test scores become the objectives of the pupils' learning. In addition, he states that the curriculum has become narrowed and student motivation has become a problem for students who consistently fail to improve. The work of Sheehan (2016), in the area of assessment policy highlights the situation where pupils' relationships with adults in the classroom are often governed by assessment priorities which are never questioned. Ball (2013), argues that the performances of the individual or the organisation i.e. the school, on a standardised test then becomes the worth or quality of that individual or organisation. This reflects a neoliberal outlook on education which supports the ideal of education as a competitive marketplace governed by measurable outputs. Apple (2016), has reflected that the measurable out puts are intensified by new managerialism dominated by audit culture and narrow reductive accountability characterised by testing. In addition, Apple (2011), argues that the current neoliberal influences in education policy exert immeasurable pressure on educators in the classroom to focus solely upon mandated standards and test scores. Ball (2013), says that such neoliberal policies subject teachers and students to the "terror of performativity". This results in education and by extension assessment being viewed through the limited lens of performance of a student or school on mandated standardised tests.

2.3.4 Challenges to Standardised Testing

Performativity, the over-reliance on standardised testing and the psychometric cultural legacy have been challenged. Educators in Australia in particular, Klenowski & Wyatt-Smith, (2012), have expressed concern that performativity may become dominant their education system. In addition, they have commented that the validity of such data is undermined if the government fails to recognise the limitations of standardised test data in particular the link between socio-economic status and low test scores. Ravitch (2013), has also challenged the validity of standardised test data as student motivation, student health, student well-being, the leadership of the school, the resources of the school, the curriculum of the school, the peer culture of the school, students' prior teachers, and many other factors that influence student learning are beyond the control of individual teachers all influence test scores. Indeed, Elwood & Murphy (2015), highlight the strength of correlation between student background and student achievement and that standardised testing ignores the identification of quality teaching and the role of equity in school systems. Furthermore, a single test cannot do an accurate job of measuring the whole person; human characteristics, motivation, behaviour, attitudes, interests, values and learning styles are simply too complex to be measured by one test (Nitko & Brookhart, 2014; Mertler, 2007).

Nonetheless, Wiliam (2010), makes the point that when standardized testing is used to hold schools accountable for the education provided and make inferences about the quality of the education alongside documenting pupil achievement, it can have a positive impact on student learning. Furthermore, he contends that even though there are documented difficulties with high-stakes accountability testing there are measures that can be introduced to allow such testing to become instructionally

supportive. These measures include ensuring that there are not too many curricular aims for each test, and that the curricular aims are expressed in language easily comprehensible to teachers. Critical thinking assessments can be carried out using performance tasks resulting in numerical data generated from rubrics; teachers can respond, collaborate and plan teaching to promote student growth (Wineburg, Smith, & Breakstone, 2016). Wiliam (2010), also maintains that the results should be reported in such a way that every student's mastery of each curricular aim can be determined with reasonable accuracy. O'Leary (2016), advises that test administration should also allow time for teachers to derive instructional benefit from the data gathered. However, time allocation will only be effective if as Cowie & Cooper (2017), argue teachers have data literacy skills to inform decision making. However, it can also be argued that contextualising data is part of data literacy.

Teachers today find themselves in a professional context where standardised testing is an unavoidable part of school practice. Much of this practice is influenced by national policy which uses data gathered from mandated standardised tests for accountability purposes. Critics have identified the limitations of relying on such data without contextualisation or any recognition of the factors outside the control of schools that affect student performance. Nevertheless, when the data are contextualised and used by skilled assessment literate teachers, such data can offer insight and allow teachers to derive instructional benefit. Becoming assessment literate is not straightforward and requires more than classroom experience and knowledge of testing.

Stiggins (2002), defines being assessment literate as the understanding and appropriate use of assessment practices, along with a sound knowledge the theoretical

and philosophical underpinnings in the measurement of student learning. A generation ago, teachers were considered assessment literate if they had the expertise to give tests that matched learning objectives (Shepard, Hammerness, Darling-Hammond & Rust, 2005). However, assessment literacy is not restricted to testing and educational measurement but also includes "formative assessment designed to assist learning" (McGee & Colby, 2014, p. 253). Price et al. (2012), state that being assessment literate, means having a deep appreciation of the purposes and processes of assessment, to make decisions that progress learning. It has also been argued, that teachers must appreciate the importance of being able to understand the disparities between various approaches to assessment in the classroom (Rindone & McQuarrie, 2010). Assessment approaches are best understood in the context of learning theory as by using an assessment approach, a teacher is subscribing to certain assumptions about learning. The following section outlines three key ideas in the field of learning theory that are relevant to this study.

2.4 A Balanced Approach to Assessment

Much has been written about formative assessment and the impact on student achievement along with the potential of formative assessment to support learning. It has been described as the major ally in the pursuit of excellence and higher standards, and as a pedagogy, is experiencing rapid success in schools (Gardner, 2010; Bennett, 2011). Nonetheless, the globalisation of education policy which emphasises measurable outcomes rather than teaching and learning processes, favours the use of standardised test data (Lingard, 2010). However, as mentioned already questions are being raised and there is beginning to be a backlash against such a reliance on standardised test data to inform policy. In an open letter to Andreas Schleicher, the OECD's director of the PISA programme, eighty academics worldwide deplored the

authoritative citing of standardised test data as a basis for educational change when the sole purpose of improving PISA rankings ("Open Letter to Andreas Schleicher", 2014). They argued that emphasising the narrow range of measurable aspects of education assessed by PISA will eradicate any other form of assessment and ultimately be harmful to students and teachers by subjecting them to more and longer batteries of multiple-choice testing. Such an outcome they argue will remove teacher autonomy. It can be argued that if teacher autonomy is eroded then teacher skills in formative assessment will not be developed. Formative assessment is a process and is difficult to quantify in the statistically dominated milieu of the outcomes of standardised test data. The purposes of each approach to assessment however, need to be recognised. Formative assessment and summative assessment have different purposes as one enables learning and the other documents achievement (Shepard, et al., 2005). In addition, Shepard et al. (2005), argue that formative and summative assessment should be coherent and mutually supportive by being conceptually aligned, representing broadly the same learning goals, the same tasks and problem types to make student learning explicit. However, if formative and summative approaches to assessment are overly aligned the student learning then becomes too tightly bound to the specific assessment method and not to the actual learning (Hickey, 2015). Hickey (2015), has theorised a framework for formative assessment called Participatory Assessment. It can be contended that he offers a starting point for a balanced and integrated approach to assessment.

The framework is underpinned by a situated approach to learning and assessment based on four principles. The first principle is that the context of the learning should give meaning to the concepts and skills being learned. The second

principle of Participatory Assessment is that the student reflection on the learning, rather than the completed artefact, should be assessed. The third principle states that assessment of individual knowledge should be done prudently. Hickey (2015), argues that the term 'prudently' refers to the opinion that individual assessments should never drive the enactment of the curriculum, should have only modest stakes for learners and should be used only in moderation to directly advance learning via formative feedback. Learners need to know that the individual assessment will not duplicate what has been assessed by the reflection.

Hickey (2015), identifies the importance of sharing with the learner the concept that individual student assessment helps the teacher to assess the instruction the student has received so adjustments can be made if needed. He argues this adds to the motivation and engagement of the student in the individual and group learning context and furthermore, students who had engaged fully with the production of the artefact and reflection achieved higher scores in the individual assessment. The fourth principle of the Participatory Assessment Framework maintains that achievement should be measured unobtrusively using externally developed achievement tests that are aligned to disciplinary standards but not to a curriculum. He argues that such tests, if well devised, can evaluate the impact of classroom assessment and document if increased learning has occurred. Once again, the tests themselves should count towards scores only enough to motivate student completion. Tests should be administered as unobtrusively as possible. Hickey (2015), notes that learning acquired specifically for a test, through practice items devoid of a context, is fleeting, and limited to boosting test scores.

Hickey (2015), does however, acknowledge the challenge for educators of the constant requirement to raise test scores, but highlights the significance of professional development for educators in assessment to equip teachers to meet the problem of balancing the approach to and the underpinning beliefs that drive assessment approaches. Gardner (2012), states that in most developed countries the pursuit of reliable and valid means of assessing learning generates large amounts of published discourse and dissent. However, it can be argued that even with discussion and research, assessment is only effective, if the teacher in the classroom is assessment literate. Developing competence in sound classroom assessment practice is a fundamental part of teacher learning because of the tensions that exist between the mandated and political use of summative assessment and that of the recognised benefits of using formative assessment. Teacher learning in assessment is made up of classroom experience, combined with research based professional development activities. Therefore, any professional development in assessment literacy needs to be grounded in models of teacher learning during professional development. The following sections discuss models of professional development and conceptualisations of teacher learning.

2.5 Professional Development Models

Professional development for serving teachers is also referred to as continuing professional development (CPD) and is a major policy priority for education systems worldwide and data now suggests varying viewpoints are adopted (Ray, 2015; Kennedy, 2014; Day & Sachs, 2004). The study of Banks & Smyth (2011), indicates that internationally, the theoretical underpinning of CPD has changed in recent times. They point out that thinking on CPD has shifted from comprising of a "one shot sit

and get workshop" (Hunzicker, 2011, p. 177), to a professional development model informed by teacher learning theorists such as Clarke & Hollingsworth (2002) and Putnam & Borko (2000). The move away from the single workshop model of professional development also reflects the key elements of andragogy[8]. Leading theorist in andragogy, Knowles (1984), states that adults need to know the "why" of learning; adults learn through trial-and-error experience; adults should own their own decisions about learning; prefer learning that which is immediately relevant to their lives; learn better from problem-based contexts than content-based environments; and learn better with intrinsic versus extrinsic motivators. Andragogy principles firmly move power, responsibility, and motivation toward the learner, away from the instructor (Knowles, Holton & Swanson, (2011). However, Halpern & Tucker (2015), argue that the list characteristics described by Knowles (1984), is not exhaustive and the individual learning context needs to be acknowledged. In this study although andragogy is relevant it cannot be used exclusively; learning in this particular context needs to be considered through the explicit lens of CPD for serving teachers.

Smith (2013), argues that the shift away from transmission type CPD is accompanied by criticism of short-term CPD approaches for failing to have any classroom impact. Avalos (2011), conducted a review of publications on CPD over a ten-year period and concluded the traditional in-service education and training model (INSET) is no longer the dominant model of CPD in the research literature. Several models of professional development are identified in the literature. One such approach is the situated learning theory developed by Korthagen (2010), which states that teacher learning needs to take place in a real-life context followed by a period of

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[8] Andragogy refers to methods and principles of adult learning theory.

focused well-planned reflection. Another approach to CPD is dialogue as a catalyst

for change (Penlington, 2008). Such an approach is characterised by teacher to teacher

dialogue as a way of changing practice and enacting teacher learning. CPD involving

the Intentional Design Process developed by Ray (2008; 2015), lays out twelve

sequenced tasks (Appendix B) that form a checklist for a replicable model of CPD.

Each task employs a specific instructional approach and has a definite purpose. Task

purposes include presenting content and pedagogical knowledge, scaffolding teachers

to identify their need in relation to the presented content and guiding teachers to apply

the new knowledge for planning purposes. Another model of CPD relies on teacher

self-assessment as a mechanism for teacher learning (Ross & Bruce, 2007). In a

separate review of CPD literature Smith (2015), argues several features are required to

improve the success and quality of professional development. High quality CPD

needs to:

- Enhance teachers' content and pedagogical knowledge

- Be on-going and sustained

- Be job-embedded

- Be collaborative and collegial in nature

On a similar theme Piggot-Irvine (2006), states that CPD should also

incorporate effective evaluation of participants' reaction; participants' learning;

organisational support and change; participants' use of new skills and knowledge; and

pupil learning outcomes. CPD can also be evaluated on the outcomes it brings about.

Harland & Kinder (2015), identified a hierarchy of outcomes for CPD. Table 2.1

provides a summary of the hierarchy of the outcomes along with the impact of each

group of outcomes.

Table 2.1 Outcomes of CPD (Harland & Kinder, 2015)

3rd Order	Provisionary (provides materials and resources); Information; New awareness	If CPD only provides these outcomes, it will have little lasting impact.
2nd Order	Motivation; Affective; Institutional	
1st Order	Value congruence; Knowledge and skills	Presence of these outcomes consistently coincide with a substantial impact on practice.

It can be argued that there must be a space for the classroom teacher to develop new practice. Otherwise, the learning from the professional development becomes aspirational and may in turn frustrate rather than empower a teacher. It can also become reduced to knowledge transmission (Loughran, 2006). Zeichner (2010), has called for the partnership between university and practitioner to seek ways in which to meaningfully combine university based knowledge and practitioner knowledge at pre-service level. Such an approach may be effective in an in-service setting as Zeichner (2010), states that where field experiences and coursework are carefully mentored by a teacher educator in a university the teacher's ability to enact complex teaching tasks at in-service level is enhanced.

The literature in the field of CPD appears to favour a move away from the one-time workshops and conferences towards the longer, more effective, cognitively-guided programmes. However, Opfer & Pedder (2011), argue that a narrow focus on the process and product of CDP initiatives has perhaps failed to recognise the influence of the individual teacher and the school in teacher learning. Even if there is a change in the processes used in CPD models, the research must take account of the individual teacher as a system, along with the school as another system. This is discussed later when change of practice in assessment is examined in more detail Indeed, Wells (2014), in her research into effective and sustainable professional development argues that the teacher must be positioned as a researcher capable of

generating change at local level. Lysaght & O'Leary (2017), highlight the role of teacher agency which will be discussed further on in this chapter, as being crucial to the success of professional development in assessment. Wells (2014), argues that affording the position of researcher in isolation is not effective; supports are needed. These include time allocation, on-going support from in-school and out-of-school leaders and the opportunity for the teacher to develop their personal learning over time about the ways they can change their practice to enhance student learning. In addition, an environment of accountability for both teacher learning, and student learning must be created.

2.5.1 Elements of Professional Development in Classroom Formative Assessment

Effective professional development for teachers in classroom assessment has certain characteristics. Figure 2.2 offers a summary of the key elements of professional development in assessment.

	Tight but Loose Formulation (Thompson & Wiliam, 2007).
Professional Development in Assessment	Choice, Flexibility, Accountability, Small Steps & Support. Teacher Learning extends beyond change in knowledge and belief. Change in Classroom Practice (Leahy & Wiliam, 2010).
	Environment that faclitates full imlementation of teacher learning, incorpporate learning communities, active learning and teacher ownership of goals (Schnieder & Randel, 2010). Teacher Agency (Lysaght & O'Leary, 2017).

Figure 2.2 Characteristics of Professional Development in Assessment

Thompson & Wiliam (2007), proposed a framework to aid the design of professional

development activities to support teachers in their use of formative assessment; the

framework was described as a "tight but loose formulation" (p. 35). The mechanics of

the professional development activity was referred to as "tight" in order to emphasise

the importance of adhering strictly to the design principles that included discussion,

critical reflection, personal action planning and summary of new learning. The

"loose" referred to the variables present in all school contexts: needs, resources,

constraints and particularities of each school and classroom context. Thompson &

Wiliam (2007), it can be argued focus on the process and the product while at the

same time allowing for the role of the individual teacher and their teaching context.

Leahy & Wiliam (2010), expanded upon this work and concluded that choice,

flexibility, accountability, small steps and support were principal elements of teacher

learning in assessment. In particular, they referred to the type of learning that went

beyond a change in knowledge and beliefs but resulted in a change in classroom

practice. Schneider & Randel (2010), noted that professional development

programmes in formative classroom assessment are "optimally implemented in

environments that facilitate full implementation of the programme, incorporate

professional learning communities, active learning, and teacher ownership of the

learning goals" (p. 273).

It is worth noting that Thompson & Wiliam's (2007), "tight but loose" concept

suggests that all professional development in formative classroom assessment appears

to start with a formalised, planned intervention involving the learning of the

classroom teacher. Even though the learning of the classroom teacher is not a

guarantee of improved outcomes for their pupils it can be argued, that without teacher

learning in the initial phase the subsequent steps of collaboration, improved outcomes

for students and sustained change in practice may not be possible. In order to develop

a deeper understanding of the teachers' learning in assessment during the "tight

phase" and subsequent "loose phase" the literature on teacher learning requires

exploration. The following section examines key conceptualisations of teacher

learning.

2. 6 Conceptualisations of Teacher Learning

Aside from the focus on the design and processes of quality professional

development activity, the literature suggests several conceptualisations of the process

of individual teacher learning. It is notable that construction and transformation are

two recurrent themes throughout the research on teacher learning. Teacher learning as

construction and transformation of knowledge features alongside transformation in

teacher beliefs, teacher attitudes and teacher pedagogies. Regardless of which model

of teacher learning is discussed, the temporality of teacher learning warrants

consideration. Learning is a trajectory, involving a construction process influenced by

temporal factors such as pace, structure and rhythms (Lave & Wenger, 1991).

Nonetheless, external temporal factors beyond the immediate context can affect

learning (Lervik, Fahy & Easterby-Smith, 2010). This section examines teacher

learning as knowledge development and teacher learning as a change in beliefs,

attitudes and practice. The role of teacher agency and identity in learning are also

considered together with the context in which the teacher learns.

2.6.1 Teacher Learning as Developing Knowledge

Teacher knowledge is considered an important factor in student progress and,

since the influential work of Shulman (1986), has been published (Kleickmann,

Richter, Kunter, Elsner, Besser, Krauss & Baumert, 2013). Shulman (1986), believed

that content knowledge[9] (CK) and pedagogical content knowledge[10] (PCK) are key

aspects in teacher professional competence. Xu & Browne (2016) as mentioned

previously (Fig 2.1), identified teacher knowledge as the guiding framework for

teacher assessment literacy. Teacher learning can then be viewed as developing and

building upon existing teacher knowledge. Indeed, Cochran-Smith & Zeichner (2005),

have argued that understanding how teacher education impacts upon teacher

knowledge lends much greater depth to any research on teacher learning. Teacher

learning continues beyond ITE (TC, 2011), and teacher knowledge develops through

engagement with implicit and explicit learning opportunities at ITE and in-service

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[9] Teacher understanding of the subject being taught.
[10] It is the knowledge needed to make a subject accessible to the student. Shulman argues that
        pedagogical content knowledge distinguishes the expert or specialist in a subject from the
        teacher or pedagogue.

level (Munby, Russell, & Martin, 2001). Therefore, it seems apposite to focus upon the development teacher knowledge as a conceptualisation of teacher learning in an in-service professional development setting.

However, discussion has arisen about the lack of clarity around the make-up of the CK and PCK knowledge required by teachers. Indeed, Hill, Ball & Schilling (2008), argue that the actual knowledge components have not been adequately researched and remain underspecified in individual subject areas and therefore the implementation and benefit of Shulman's (1986), ideas have fallen short of expectation. If teacher learning in assessment is to be considered through the lens of knowledge development, the knowledge base for assessment both in terms of CK and PCK must be identified and evaluated throughout the professional development activity. Otherwise, learning as knowledge development may remain theorised and not operationalised in a practical way. Even though assessment is not viewed as a discrete subject like mathematics of literacy there is a research based body of knowledge necessary for teachers to carry out effective classroom assessment. The quality and source of course materials therefore must link to this body of knowledge (Xu & Browne, 2016), and not rely upon a collection of handy strategies or classroom tips.

Given the remarks about the unspecified nature of CK and PCK it is not enough to merely name the types of knowledge required for professional competence, but teachers need to know how to source such knowledge. Sourcing the correct knowledge is key to learning. It is notable that Shulman's (1986), work could be considered stronger in the area of identifying the sources of knowledge. Among the sources of teacher knowledge identified by Shulman (1986), are scholarship in the

content area, the materials and settings of the educational process, research on schooling learning and teaching and the wisdom of practice. However, it can be argued that the knowledge cannot be sourced and transferred to the teacher without some activity on the part of the teacher and even though assessment is not a taught subject in the classroom it can be argued that the teacher still needs the same CK and PCK as say literacy and mathematics. Otherwise, assessment is viewed as an add-on activity for compliance rather than integral part of the teaching and learning process. The activity by the teacher involves interaction and transformation in order to develop new knowledge of assessment. The interaction with the source can be seen as the process of developing new knowledge.

It is interesting to note that Wilson, Shulman & Richert (1987), viewed assessment or evaluation and part of a teacher's pedagogical reasoning (Figure 2.3).
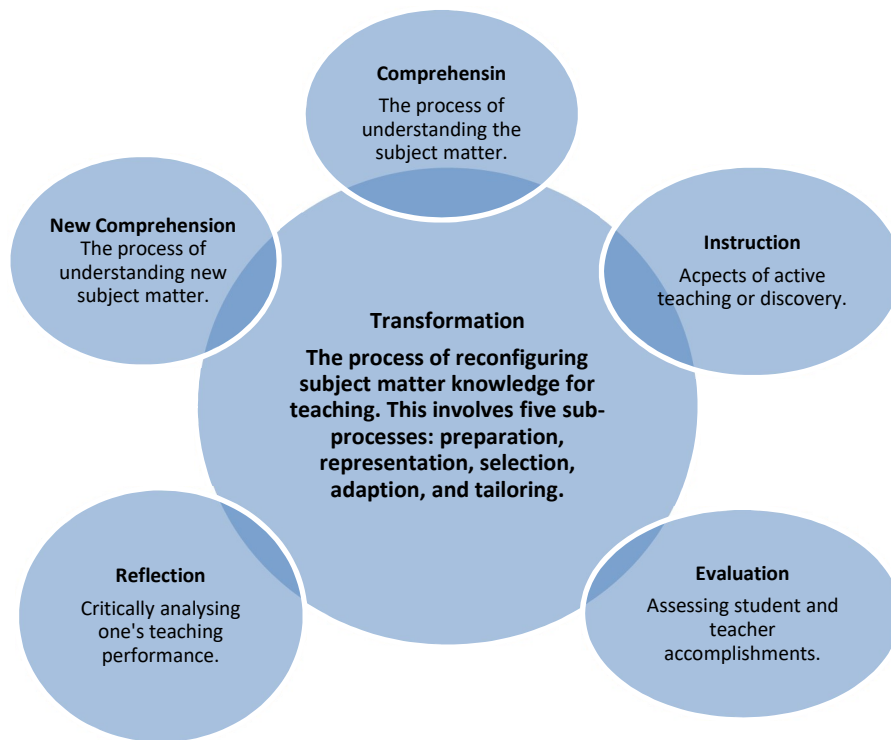
Figure 2.3 Model of Pedagogical Reasoning and Action adapted from Wilson, Shulman & Richert (1987)

However, in order to learn about assessment as a teacher it should be considered both as a subject, but not necessarily one to be taught, and a pedagogy. If assessment is considered as a subject and a pedagogy, knowledge and activity are important. Finally, the role of the teacher educator needs to be considered. Strong CK and PCK in the area of assessment are requirements for the provision of any professional development activity in classroom assessment.

2.6.2 Teacher Learning as Change

The development of teacher knowledge is a key feature of teacher learning; however, teacher learning can also be examined through the lens of change or shift in teacher beliefs and changes that occur in pedagogies used in the classroom. Tan & Nashon (2013), in their work with science teachers, framed teacher learning as an

evident shift in beliefs and that a shift in beliefs led to a change in classroom

practices, an increased awareness of the possibilities and limitations of existing beliefs

and a gaining of new understanding about pedagogy. In comparable manner, Hall &

Hord (2006), framed teacher learning in terms of the response to professional

development focussing on changes in the concern for the new material and changes in

use of the new material. Table 2.2 provides a summary of the stages of concern for the

innovation, describing the personal response by the teacher to the professional

development. Levels of use of the innovation are described in Table 2.3.

Table 2.2 Levels of Concern in Response to Professional Development (Hall & Hord, 2006).

Type of Concern	Stages of Concern	Explanation
Impact	(6) Refocusing	Making or considering making modifications to the innovation
	(5) Collaboration	Interested in working jointly with others to benefit students.
	(4) Consequence	Concerned about the impact the innovation is having on students
Task	(3) Management	Concerned about managing tasks and the logistics of use
Self	(2) Personal	Concern about ability to carry out task and the personal investment required
	(1) Informational	General awareness of the innovation and a desire to learn more
Unrelated	(0) Unconcerned	Little or no interest in the innovation

Table 2.3 Level of Use in response to professional Development (Hall & Horde, 2006).

User Level	Type of User	Explanation
IV User	Renewal	Re-evaluates and considers changes to increase impact on students
V User	Integration	Combines efforts with colleagues to benefit students
IVB User	Refinement	Varies use to meet student or organisational needs
IVA User	Routine	Use has stabilised and no though is given to changing the innovation
III User	Mechanical	Focuses on short term approach with no reflection
II Non-user	Preparation	Preparing for use
I Non-user	Orientation	Acquiring or recently acquired information
0 Non-user	Non-user	Little or no knowledge or involvement

Teacher learning can range from little or no interest in the new learning to implementing and modifying the new ideas to suit the needs of the students. However, Tan & Nashon (2013), also argued that it is not sufficient to identify the shift in belief, but research must examine the relationship between the teacher belief and the environment in which the teacher learns. Such an assertion builds upon the work of Clarke & Hollingsworth (2002), who argue that change takes place within an environment. An overview of the components of the change environment are provided in Figure 2.4.

The Change
Environment

*External
Domain*

External Source
of Information
or Stimulus

*Domain of
Practice*

Personal Domain

Knowledge
Beliefs
And
Attitude

Professional
Experimentation

Salient
Outcomes

*Domain of
Consequence*

→ Enactment
- -▶ Reflection
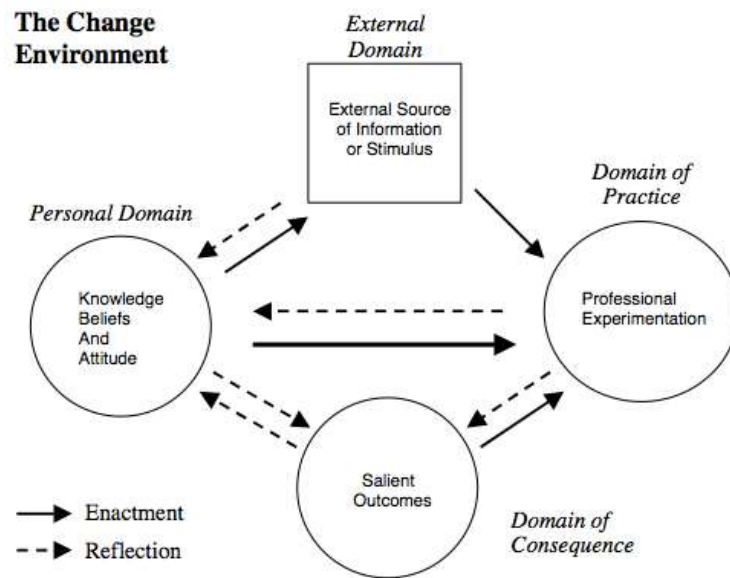
Figure 2.4 Interconnected Model of Professional Growth (Clarke & Hollingsworth, 2002)

The change environment is comprised of separate domains: the external domain, the
domain of practice, the domain of consequence and the personal domain. Teacher
knowledge, beliefs and attitudes, according to Clarke & Hollingsworth (2002), are
part of the personal domain of the teacher but the salient outcomes arising from the
change are found in the domain of consequence.

If teacher learning is considered through the lens of a change or shift in
teacher beliefs or practices the literature would suggest that it is not sufficient to
identify the change. The change should be located within a continuum of use and
concern for the material covered, in order to evaluate the depth of teacher learning and
by extension the response to the professional development activity. In addition, the
change environment needs to be recognised alongside the processes that bring about
the changes. However, even though the changes brought about because of the learning
are viewed as individual to each teacher the initial learning happens within a

community. The concept of community is important when considering the literature on teacher learning.

2.6.3 Teacher Learning and the Concept of Community

As mentioned in previous sections, teacher learning can be conceptualised as development of knowledge within the individual teacher. The learning can also be viewed as a change in the beliefs, attitudes and practices of the individual teacher. The outcomes of the professional development activity have been considered in the individual teacher however, the process of learning about something does not take place in complete isolation. This study focuses upon the learning during an on-line and blended professional development activity. The interaction during the online and face-to-face portions of the course can be viewed as community of practice. The concept of community of practice is explored by Hammerness et al., (2005), who state that new teachers learn to teach in a community that enables them to develop a vision for their practice; a set of understandings about teaching, learning and children; dispositions about how to use the knowledge; practices that allow them to act on their intentions and beliefs; and tools that support their efforts. They also argue for a broad meaning of community extending beyond the learning of a new teacher; a view echoed by Farnsworth, Kleanthous & Wenger-Trayner (2016). It can be argued that a professional development activity is a community of practice striving to develop understanding, dispositions, vision, tools and practices in classroom formative assessment. Table 2.4 expands upon the characteristics of the teacher learning community. Hammerness et al. (2005) also state that purposefully fashioned professional communities that share norms and practices can be especially potent influences on learning.

Table 2.4 Framework for Teacher Learning Community (Hammerness et al., 2005)

Understanding	Deep knowledge of content, pedagogy, students and social contexts including learning theory and discipline
Dispositions	Habits of thinking and action about children and teaching including reflection upon practice, taking an inquiry stance
Vision	Images of the possible; images that inspire and guide practice
Tools	Conceptual and practical resources for use including learning theory or assessment tools
Practices	Developing, practicing and enacting a beginning repertoire including how to scaffold discussion, provide feedback etc.

This reflects Wenger et al. (2002) who state that communities of practice are a group who share a common concern, a set of problems or a passion about a topic and who develop their knowledge by interacting on a recurring basis. Wenger (1998), it can be argued viewed the community of practice as an active entity as he placed emphasis on the importance of active participation in the community; active engagement results in to learning. Learning is generated through the social engagement of the participants. Learning is not just the accumulation of knowledge and routines but a process of becoming. The effective community of practice is made up of individuals who engage in joint enterprise, mutual engagement and have a shared repertoire and develop a new identity as a member of the community.

The term "joint enterprise" has been modified to "domain" to indicate the area in which the group has legitimacy to claim competence (Farnsworth et al., 2016). Wenger (1998), argued that joint enterprise or domain of practice and mutual engagement happened when participants took ownership of their own learning while engaging fully in the process and making meaningful contributions. The shared repertoire refers to key documentation and professional language needed to operate within the community of practice. Morley (2016), comments on Wenger's (1998), community of practice and argues that the model of community of practice appears to ignore the previous learning and power inequalities that may exist in a community.

Teacher learning communities can be viewed as communities of practice. Indeed, Hargreaves (2013), comments in her study on school based teacher learning communities[11] that a learning community is a process of teacher development. Learning communities contribute to effective CPD and sustained improvement when leaders respect and value the needs of the participants; they are school based and integral to the operation of the school; there is teacher collaboration; and there is expert input to support the teachers' theoretical and practical learning. Cuddapah & Clayton (2011), caution against idealising the community of practice as universally positive and concluded that groupthink and misconceptions about teaching and learning can become endorsed. Indeed, Cochran-Smith & Lytle (2009), has highlighted the difficulty of communities of practice in the area of assessment which are established with the sole purpose of scrutinising tests data as opposed to learning or professional development. It can be argued that without some form of research based input, or reference to external expertise a professional development community of practice may not facilitate new learning. This is the situation, if teacher learning happens solely in the work place without an opportunity to engage in reflective professional development. It is realistic, therefore, to suggest that learning about assessment in a community of practice needs to focus on theory of assessment, practice of assessment, learning and teaching contexts of course participants and in addition, the engagement on the participants in the learning community formed during

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[11] Teacher Learning Communities are defined as meetings in which professional learning was supported as teachers learned about Assessment for Learning (AfL). The teacher learning communities were made up of some or all teachers in a school, who meet regularly to reflect on their own and each other's Assessment for Learning (AfL) practice in order to develop as teachers. The Teacher Learning Communities are distinct from Professional Learning Communities in that their focus is specifically on practice, in this case AfL practice, rather than teaching and learning more generally.

a professional development activity. However, it can also be argued that the professional learning activity needs to include an element dealing with the theory of teacher learning in order to foster meaningful engagement. Currently, meaningful engagement is a requirement for course completion but maybe this concept needs to be explored further with participants and not just course providers.

Teacher learning as a response to a professional development activity is viewed in the literature as subject knowledge and pedagogical knowledge development. Learning by teachers is also perceived as a change in beliefs and classroom practices of the individual teacher. Even though the teacher learning takes place for the individual teacher, the process of learning is situated within a community context involving interaction, common purpose and shared professional language. The literature thus far has considered teacher learning in non-subject specific contexts, however, teacher learning in assessment is also framed in terms of required knowledge and skills necessary to allow that knowledge to benefit students (Xu & Browne, 2016). Teachers with developed learning in assessment have certain attributes, however, as referred to earlier Lysaght and O'Leary (2017), indicated that professional development cannot be viewed in isolation; the concept of teacher agency warrants consideration as a factor influencing both individual teacher learning and the benefits derived from professional development.

2.7 Teacher Agency and Identity

Whatever model of teacher learning is considered, the role of teacher agency and identity need to be taken into account. This section examines the concept of agency and the connections between teacher agency and teacher learning. Loughran (2007), has argued that without agency, teacher learning becomes reduced to the absorption of facts and knowledge. Indeed, Coffman (2015), has argued that teacher

educators are tasked with the responsibility of building agency within both teacher candidates and serving teachers to "have the knowledge, skills, and ability to not only improve student learning but to also critically reflect and advocate for teaching and learning issues and policies" (p.323). This is a broad view of agency however, Pyhältö, Pietarinen & Soini (2015) define agency regarding teacher learning as engaging in professional development and "a capacity that prepares the way for the intentional and responsible management of new learning, at both an individual level and community level" (p. 813). They also state, that as an active professional agent, a teacher sees themselves as an active learner who is able to act intentionally, make decisions, and thoroughly reflect on the impact of their own actions. Teachers' professional agency refers also to a teacher's ability to act in new and creative ways, and also display the ability to resist external standards and policies when teachers believe they are incompatible with professionally valid educational activity (Lasky, 2005). Teachers' current environments and past experiences can serve to shape, constrain, and enable professional agency (Emirbayer & Mische, 1998).

A good deal of the literature on teacher agency in influenced by the work of Bandura (1997), who identifies three major determinants of human action: behaviour, internal personal factors, and the external environment. Bandura (1997), supports the idea that individuals are neither fully autonomous nor automatically responsive but react in a way determined by the interaction of behavioural, personal and environmental factors. Latour (2005), however, adds another dimension, saying that alongside the capacity to make meaningful choices, and take purposeful action, is the idea that agency is only activated as part of a group or community.

The idea of "constrained agency" is used by Herndl & Licona in Weber (2013), to help explain the relationship between social structures that both limit and enable choice and action. Even though Edwards (2015), in her reflection on eight articles about teacher agency, concluded teacher agency was a difficult concept to define, she highlighted teacher responsibility and the willingness to conduct strong evaluation of personal practice as key elements of teacher agency. However, Robinson (2012), emphasised the choices made by teachers were indicators of agency; agency involves "internalising choices, analysing and reflecting based on past experiences and future trajectories" (p.233). Developing the idea of reflecting and making choices, Biesta, Priestly and Robinson's (2015), model for understanding teacher agency (Fig 2.5) derived from their two-year study in Scotland, identified the factors that influence choices made by teachers. The authors frame agency as an action, stating "the achievement of agency is always informed by past experience, including personal and professional biographies; that it is orientated towards the future, both with regard to more short-term and more long-term perspectives; and that it is enacted in the here-and-now, where such enactment is influenced by what we refer to as cultural, material and structural resources" (Biesta at al., 2015, p. 627). Buchanan's (2015), study comments on the relationship between teacher identity and agency; elements of a teacher's professional identity namely ideological positions dictate how teachers react to policy and culture.

Practical-evaluative

- Cultural
  - Ideas, values, beliefs, discourses, language
- Structural
  - Social structures (relationships, roles, power, trust)
- Material
  - Resources
  - Physical environment

Iterational

- Life histories
- Professional histories

Projective

- Short term
- Long term
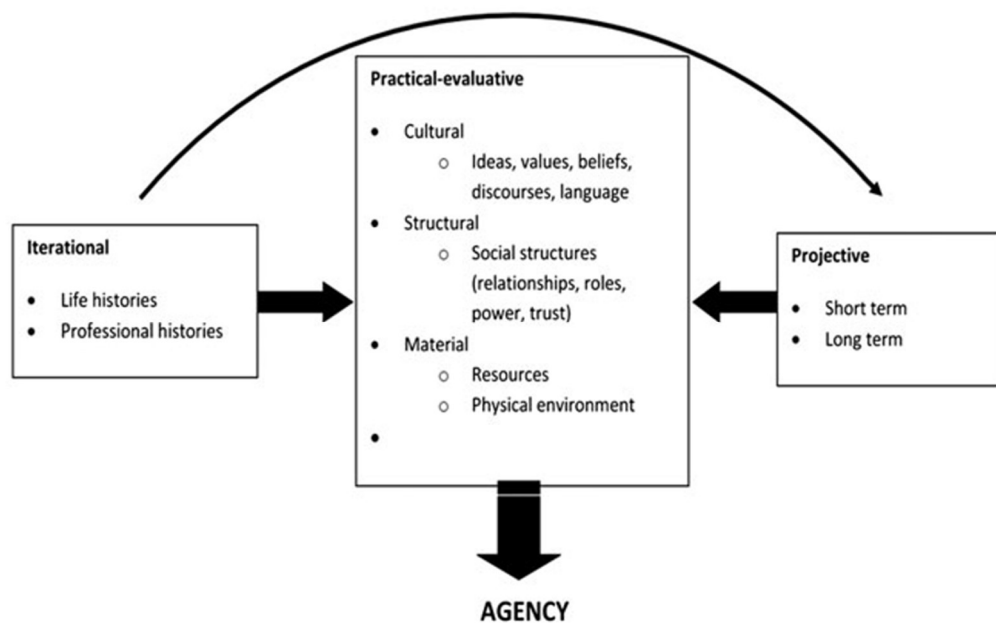
AGENCY

Figure 2.5 Model for Understanding Teacher Agency (Biesta et al., 2015)

Hall (2008), has also argued that agency and identity are fundamental to understanding the processes of becoming, doing and participating in a social world or community. Although, Hall's (2008), work is focused on moving from the social world of childhood to the social world of teenhood much of the theoretical underpinning is applicable to teacher learning in assessment. Of particular interest, is the idea that an identity is performed and lived in the everyday (Lave, 2012), open to construction (Bruner, 1990), and is social and mediated (Wertsch et al., 1995). Teacher learning in assessment can be viewed therefore as an assessment identity and the everyday assessment practices evident through discussion or in the classroom reflect the teacher identity. It is interesting to note that Hall (2008), argues that identities can "be made available and chosen through participation in activity and that a person's agency lies in the choices made" (p. 88); agency also "allows the taking up of new and the relinquishing of old identities" (p. 103).

Wenger (2008), offers the idea of learning can be considered as a type of identity formation and the preparation needed to enter or leave a community of practice. He also argues that identity formation is temporal, ongoing and part of a complex trajectory; any act of learning something new is not just a local act of learning but is an event on a trajectory through which they give meaning to practice in terms of their identity.

Broadly speaking teacher agency can be defined as the actions teachers take in response to an event. However, Priestly, Edwards, Priestly and Miller (2012), referred to agency "not as a quality of the actors themselves … how humans are able to be reflexive and creative, acting counter to societal constraints, but also how individuals are enabled and constrained by their social and material environments (p.14). In this study, the focus is on the teacher reaction to the professional development activity in assessment and how an assessment identity is selected. Even though agency is a complex phenomenon, there are clearly defined influences but is it notable that studies appear to focus on identifying, theorising, defining agency and agentic characteristics. Little is written about how to develop agency within teachers and if there is a connection between teacher learning and developing agency. The next section examines the pedagogical processes that result in teacher learning about assessment.

2.8 Teacher Learning in Assessment

This portion of the literature review focuses on teacher learning in assessment, assessment literacy and the specific approaches that have been identified in the literature that contribute to assessment literacy and teacher learning. The section begins with recognised teacher education theory in general followed by a focus on pedagogies for teacher learning in assessment. The pedagogies discussed include

perspective building conversations, examining motivation and learning theory, praxis, assessment design, modelling and reflection.

Teacher learning in assessment or assessment literacy is evident when teachers have deep knowledge of assessment and demonstrate skilled use of assessment in a classroom setting (Gearhart et al., 2006; Xu & Browne, 2016). Assessment literacy is also referred to as assessment competency or assessment capacity and as mention previously is a core professional requirement across education systems (DeLuca et al., 2015). Assessment literacy is present when the "teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making" (InTASC, 2011, p. 15). Assessment literacy can also be viewed as robust professional knowledge of assessment divided into knowledge of strategies, knowledge of purposes, knowledge of what to assess and knowledge of what action to take following assessment (Abell & Siegel, 2009; Siegel & Wissehr, 2011). As discussed earlier in Section 2.1 this knowledge of assessment is seen by Xu & Browne (2016), as the guiding framework for assessment practice in the classroom. Knowledge of assessment can be compared to Shulman's (1986), subject of content knowledge. It can be argued however, that assessment literacy extends beyond knowledge and that teacher learning in assessment extends beyond acquiring knowledge of assessment. The ability to operationalise the knowledge as an assessor in a teaching context is just as pertinent to assessment competency in a teacher. Once again, this reflects Shulman's (1986), notion that the content knowledge must be accompanied by the skill to make the knowledge accessible to the classroom student; such an attribute is referred to as pedagogical content knowledge. Box, Skoog & Dabbs (2015), in their case study of

the personal practice of classroom assessment by individual teachers, concluded that

each teacher has what they referred to as a personal practice assessment theory

(PPAT). Influenced by the work of Clandinnin & Connolly (1996), they stated that

"personal practice theory in general includes a teacher's tacit knowledge about

content, pedagogy, curriculum, learners, educational aims and contexts, and

pedagogical content knowledge" (Box et al., 2015, p. 960). Figure 2.6 is the model of

assessment development for teachers as proposed by Box et al. (2015), which

proposes that teachers' personal practice assessment theory influences what and how

they assess and in turn are influenced by external and internal contextual elements.
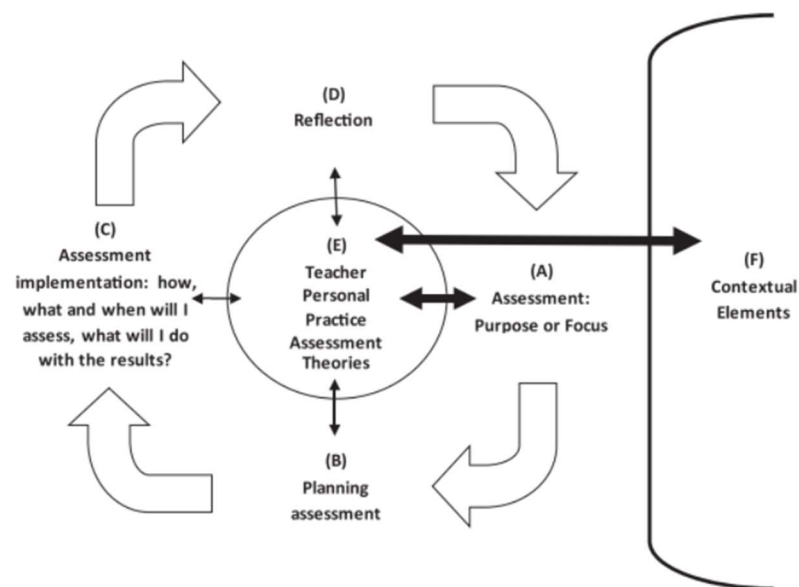
Figure 2.6 Teacher Practices Related to Formative Assessment (Box, Skoog & Dabbs, 2015).

Contextual elements externally constructed according to Box et al. (2015), include

testing, school norms, autonomy, curricular requirements, collegial beliefs. Internally

constructed contextual elements include teacher knowledge, models of learning

beliefs. Teacher practices in assessment according to the model develop if reflection is

part of the practice "Throughout the cycle, they reflect (D in Figure 2.6) on the effectiveness of the assessment activity, which in turn may or may not modify their PPATs and assessment decisions for the future" (Box et al., 2015, p. 961).

The teacher's learning in assessment consequently needs to consist of both content and pedagogical content knowledge to allow students to access the benefits of classroom assessment. As outlined earlier criticism has been levelled at the lack of impact of Shulman's ideas because there has been limited explicit description of the CK and PCK required in discrete subject areas. However, research in the area of assessment has made some progress around offering descriptions of required teacher knowledge in assessment for the classroom and modelling the influences on classroom practice and highlighting the role of reflection (Xu & Brown, 2016; Box et al., 2015).

Indeed, Brookhart (2011), provides a compendium of the knowledge; and skills necessary for a teacher to be considered assessment literate, the key elements of which are summarised in Table 2.5. In addition to the work of Brookhart (2011), McGee & Colby (2014), specify knowledge of and skilled use of both standardised test data and classroom assessment as part of the teacher knowledge base in assessment.

Table 2.5 Standards for Teacher Competence in Educational Assessment of Students (Brookhart, 2011)

Standards for Teacher Competence in Educational Assessment of Students
1. Teachers should understand learning in the content area they teach.
2. Teachers should be able to articulate clear learning intentions that are congruent with both the content and depth of thinking implied by standards and curriculum goals, in such a way that they are attainable and assessable.
3. Teachers should have a repertoire of strategies for communicating to students what achievement of a learning intention looks like.
4. Teachers should understand the purposes and uses of the range of available assessment options and be skilled in using them.
5. Teachers should have the skills to analyse classroom questions, test items, and performance assessment tasks to ascertain the specific knowledge and thinking skills required for students to do them.
6. Teachers should have the skills to provide effective, useful feedback on student work.
7. Teachers should be able to construct scoring schemes that quantify student performance on classroom assessments into useful information for decisions about students, classrooms, schools, and districts. These decisions should lead to improved student learning, growth, or development.
8. Teachers should be able to administer external assessments and interpret their results for decisions about students, classrooms, schools, and districts.
9. Teachers should be able to articulate their interpretations of assessment results and their reasoning about the educational decisions based on assessment results to the educational populations they serve (student and his/her family, class, school, community).
10. Teachers should be able to help students use assessment information to make sound educational decisions.
11. a. Coach students to analyse their own assessment results.
12. b. Help students to meaningfully track their own learning.
13. c. Help students communicate about their own learning.
14. d. Help students plan next steps in their own learning (what and how to study or practice, for example).
15. Understand relationship between assessment and student motivation, including feelings of control and self-regulation.
16. Teachers should understand and carry out their legal and ethical responsibilities in assessment as they conduct their work.

Furthermore, McGee & Colby (2014), contend that developing sound classroom assessment practices is becoming increasing difficult for teachers because of the proliferation in accountability policies and practices that use standardised test data from students to evaluate student learning and teacher performance. Brookhart (2011), however, argues that the competences required by teachers in order to be considered assessment literate need to take account of the policy environment. The statements (Table 2.5) aim to promote formative assessment in an accountability dominated era. In response to the accountability demands and standards-based reform, there have been calls for more use of formative assessment approaches (Wiliam, 2011; Popham, 2011).

Willis, Adie & Klenowski (2013) maintain that assessment literacy needs to be defined in the context of the messages to which teachers are subject about curriculum, pedagogy and assessment; the teacher needs multiple assessment literacies each

developed through knowledge gained from the teaching environment in which the teacher operates. Moreover, teacher assessment literacy is located within the vertical and horizontal structures of educational discourses[12] (Bernstein, 1996, 1999). Similarly, Box et al. (2015) include the recognition of externally and internally constructed contextual factors as integral to the development of teacher practice in classroom assessment. Fulmer, Lee & Tan (2015) devised a multi-level model of contextual factors, Table 2.6 identifies key elements from each level of influence that impact upon teacher practice in assessment.

Table 2.6 Multilevel Model of Contextual Factors that may influence Practice in Assessment. (Fulmer et al., 2015)

Level	Elements
Micro-level	Immediate context of classrooms; teacher's assessment literacy; number of students; students' prior performance in the topic area; teacher–student interactions; tools and technology
Meso-level	Policies; supports from school leadership for assessment; school's climate for supporting assessment practices; requests and expectations of parents and the immediate community
Macro-level	Education policies at the national level, state level and district level; cultural norms around education and assessment; social and economic pressures; effects can still be explicit and pervasive.

The assessment context is conceptualised in a comparable manner by Willis et al, (2103) involving the teacher negotiating their assessment judgement decisions and developing their assessment literacies across several sources of knowledge about assessment which include:

- The locally generated school-based understandings of assessment policy, processes and practices.

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[12] Vertical discourses are 'official' or 'schooled' knowledge, and horizontal discourses as 'local' or 'common sense' knowledge. This was the theory used to describe how knowledge and language is acquired in a community of practice (Bernstein, 1999).

- The teacher's learned knowledge of a discipline for example, the different discipline knowledges of mathematics, science or English.

- The teacher's personal beliefs about learning and assessment, and the role of students in these processes developed through experience.

It is noteworthy that teacher personal beliefs (Willis et al., 2013), or philosophies of assessment (Abel & Siegel, 2009), feature as significant elements of assessment literacy. This idea is similar to teacher learning viewed in the context of changes to attitudes and beliefs. It is also similar to PPAT as proposed by Box et al. (2015). It can be argued that the element of personal beliefs and philosophy of assessment literacy cannot be developed fully by classroom practice but by professional development activities that allow teachers the space to explore their existing beliefs and assumptions about teaching and learning and develop new beliefs from those with different experiences. Such an approach is the cornerstone of teacher education (Lortie, 1975; Wilson, 1990; Darling-Hammond, 2006; Korthagen, 2012). Box et al. (2015), included reflection as the process by which teachers develop their personal practice in assessment. In addition, assessment literacy is also conceptualised as having an ethical and moral dimension by seeking to remove barriers to authentic student involvement in the assessment process. Willis et al. (2013), identified the teachers' "reading" the degree of student participation was linked to ethical practice.

The literature regards teacher learning as a complex combination of knowledge development and changing of attitudes, beliefs and classroom practices brought about by a combination of practice and reflection. Even though doubt has been cast on the lack of specificity in some subject areas and has made the use of these theories of teacher learning challenging. However, in the area of assessment,

specific knowledge, attitude, belief and practice descriptors has made it easier to evaluate responses to professional development and identify teacher learning. Nevertheless, pedagogical approaches during the professional development to bring about the learning need more research. Indeed, Cochran-Smith & Zeichner (2005), have claimed that the pedagogical approaches to support such learning are not specified. However, the work of Box et al. (2015), would suggest that reflection contributes to the development of assessment literacy. It would seem appropriate therefore to examine the literature and identify pedagogies that support teacher learning in assessment.

2.8.1 The Processes that Result in Teacher learning

Developing teacher knowledge and fostering teacher learning requires not only an understanding of teacher learning as a concept but an understanding of the processes or pedagogies and teaching approaches used to achieve the outcome of teacher learning. Loughran (2006), asserted that pedagogy in teacher education is the predominant force that changes teacher candidates' conceptions and practices of education, which have been developed ''from years of an apprenticeship of observation'' (p. 173). Applying this to assessment, these observational years in schooling have for many teachers been grounded in negative experiences of assessment that operate from traditional assumptions of measurement and that largely emphasized summative assessment processes (DeLuca & Klinger, 2010; Grossman, 1991; Harrison, 2005). To counteract the apprenticeship of observation in teacher education in general Loughran (2006), articulates principles of practice involved in enacting a teacher education pedagogy which focus upon the teaching behaviours and approaches of the teacher educator. He argues that for the teacher educator "in

focusing on our teaching behaviours, it is important to recognise that simply modeling practice through the use of a range of teaching procedures or teaching about teaching by using engaging strategies is in itself not sufficient in teacher education" (p. 85). The key principles of practice Loughran (1997), believes that characterise teacher education pedagogy are relationship, purpose and modeling. Quality teacher learning involves pedagogies that "disrupt the apprenticeship of observation" (Westrick & Morris, 2016). They argue that such effective teacher education pedagogies must contain five separate elements that reflect Korthagen's (2010)[13] three level model of teacher learning. Teacher education and assessment education, it can be argued require similar pedagogical underpinning. Loughran (2015), contends that pedagogy is much more than a way of teaching it is about the teaching-learning connection and developing a deep understanding of the relationship between teaching and learning. Assessment education for teachers can draw on this understanding pedagogy and focus upon assessment and learning about assessment as a teacher. Indeed, Table 2.7 provides an overview of the key elements of a possible pedagogy of assessment as informed by Korthagen (2010) and Loughran (1997, 2007).

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[13] Korthagen's (2010) model of teacher education consists of firstly the gestalt level the unconscious immediate reaction of a teacher to a situation; secondly the schema level the conscious actions carried out by the teacher and the theory level consisting of the theory of teaching and learning relevant to a situation. Korthagen argues that teachers mainly operate at gestalt level and unless the theory and reflection become part of the automatic actions of teachers new learning is very difficult for teachers.

Table 2.7 Pedagogy of Assessment Informed by Korthagen (2010) and Loughran (1997, 2007)

Korthagen (2010)	Loughran (1997, 2007))	Synthesis of Korthagen (2010) & Loughran (1997, 2007)
Effective pedagogies involve 1.The presentation of dramatically new ideas to elicit the awareness of gestalts and unexamined assumptions about teaching and learning 2.The usefulness of affect in awakening that awareness 3. An opportunity to develop metacognition and process reactions through writing that uncovers gestalts and articulates new understandings as schemas. 4. Cognitive work that engages with concepts and ideas from the new schema, rather than ideas that are too abstract or settled. 5. Experiences or topics that reveal the complexity of teaching while also offering practical and conceptual tools accessible to those at beginning levels of Korthagen's (2010) three-level model of professional learning.	The principles of teacher education pedagogy are 1.Relationship Teaching about teaching must take place within a responsive, sensitive relationship where challenges are confronted in a thoughtful manner. Trust, honesty and independence are displayed otherwise if there is lack of free agency the teacher education becomes a superficial process of absorbing knowledge and facts. (Loughran, 2007) 2. Purpose Purposeful teaching involves teaching for understanding. Teacher educators teach the purpose of the skills and knowledge needed by a teacher rather than just technical competence in an area. Purpose is fostered through engagement, challenge and metacognition. 3.Modeling If teachers are to develop a particular. teaching approach they need to experience the same as a learner. Part of the modeling process involves the teacher educator modeling reflection on what happens during their teaching. Reflection cannot be considered a key element of teacher education if the reflection process. is not modelled by the teacher educator. The same applies to risk taking	1.Presentation of new ideas to elicit awareness of unexamined ideas of assessment gained through schooling or practice. 2.The usefulness of affect 3.Evidence of metacognition 4.Cognitive work that engages new ideas in a practical context. 5. Experiences that reveal the complexity of assessment while offering practical and conceptual support to those at the beginning of their career. 6.Teaching about assessment takes place in a responsive, sensitive relationship where challenges are confronted in a caring manner. Honesty and independence that foster the agency of the teacher moving beyond absorbing knowledge and facts about assessment. 7. Teacher educators teach about assessment in a purposeful manner through engagement, challenge and metacognition. 8. The purpose of teacher education in assessment extends beyond technical competence. 9. The teacher educator models assessment approaches alongside reflection upon the assessment approaches. 10. The teacher educator takes risks, reflects and encourages others to do the same.

2.8.2 Pedagogies in Teacher Learning About Assessment

In the review of assessment education literature carried out by DeLuca et al., (2013), results suggest that assessment education for teachers is effective when it features content-based pedagogies and process-based pedagogies. Content-based teaching focuses upon didactic instruction centred on lectures, text and case-based learning. Process-based pedagogies involve practising the art of assessment; having opportunity to implement course based learning into field based teaching experiences and the use of assessment for learning approaches with the teacher candidates' own

learning. It can be argued that the literature on assessment education for teachers broadly reflects the idea put forward by Shulman (1986), of CK and PCK and reinforce the notion that teacher learning has to demonstrate growth in the areas knowledge of assessment and the skills to allow students to benefit from assessment. Elaboration is provided by Shepard et al. (2005), who identified four specific pedagogical approaches that help new teachers develop an understanding of assessment. The four approaches described are: analysis of student work and learning; engagement in assessment design; examining motivation and learning theory and how they connect to assessment; and evaluating assessments for accountability. Schneider & Randel (2010), argue that the documenting of the impact on the teacher practice represents a "proximal outcome" (p. 269) and student achievement is integral to professional development in conjunction with the actual teaching approaches used during the professional development activity. They also argue that any research into professional learning in assessment will not lead to deeper understanding of the impact of professional development without examining the impact upon teachers. It is worth noting that as mentioned earlier teacher learning is considered in terms of knowledge development and changes in beliefs, attitudes and practices and without methods of exploring these it is not valid to examine the pedagogies used during the learning without confirming the outcome for the teacher.

De Luca, Klinger, Pyper, Shulha & Woods (2015), argue that professional development evaluative claims can be made when linked to teacher learning goals and highlight the need for professional development efficacy to be linked to teacher professional judgement of their own learning achievements rather than to statistical evaluations. They assert that statistical evaluations can in time become political. It can

also be argued that statistical evaluations may not take account of the unique teaching context of each teacher; whereas a teacher's professional judgement made following professional development is more valuable and useful as it takes account not only of the teaching context but of the learning context for the individual teacher. It seems therefore that professional development in assessment must include follow-up evaluations of teacher learning and classroom practice. Long term, if teachers are given the opportunity and tools to reflect upon and evaluate their own learning with reference to articulated understandings of formative assessment and classroom practice professional development in formative classroom assessment will continue to evolve.

Structuring and implementing a replicable model of assessment education is not without challenges. While teachers want consistent professional development opportunities anything that is too prescribed may not allow for the space to connect to individual teaching contexts. The use of consistent pedagogies rather than activities would seem more suited. Even though Thompson & Wiliam (2007), set out six activities that make up the design principles of a teacher learning session it is difficult to consider them individually as pedagogical approaches. The activities specified included: Introduction, Starter Activity, Feedback, New Learning about Formative Assessment, Personal Action Planning and Summary of Learning. The design principles for teacher learning in assessment (Thompson & Wiliam, 2007), perhaps need to be underpinned by more specific approaches (Figure 2.5) such as those suggested by De Luca et. al (2013), Schneider & Randel (2010), Shepard et al. (2005). There follows now a discussion on the individual specific pedagogies as identified in the literature.

Model of Professional Development in Assessment

New Ideas and Perspectives about Assessment	Teacher Affect about Assessment Stimulated
Experiencing Quality Assessment Approaches followed by quality reflective activity	Teacher Educator models assessment and reflection
Knowledge of Motivation and Learning Theory, Policy Influences and Assessment Design	
Responsive, Honest relationship with teacher educator that fosters teacher agency and confronts challenges	Teacher Educator teaches in a purposeful manner through engagement and metacognition. Learning extends beyond knowledge and fact
Analysis of Student work and student learning (Shepard et al., 2005)	Teacher Educator takes risks and encourages students to do the same
Experiences that reveal the complexity of assessment while offering practical and conceptual support to those at the beginning of their career	
Using Quality Assessment Approaches in the professional field (Praxis) followed by quality reflective activity	Follow Up Evaluation of Teacher Learning and Classroom Practice to establish proximal outcome

Figure 2.7 Model of Professional Development in Assessment as informed by De Luca et al., 2013; Korthagen, 2010; Shepard et al., 2005; Loughran, 1997, 2007; Schneider & Randel, 2010

2.8.3 Pedagogies to Develop Assessment Literacy

Developing assessment knowledge and skills, changing beliefs and establishing practice form part of assessment learning for a teacher. The process by which this outcome is achieved by a teacher, particularly in a professional development activity, is "enmeshed in ways in which teacher educators knowingly and purposefully create opportunities for students to see into teaching" (Loughran, 2007, p 1). Even though Loughran (2007), a key theorist in the area of pedagogy for teacher educators, is talking about teaching in general it can be argued that the same principles apply to learning about assessment. Therefore, a teacher educator must employ clearly defined approaches when creating purposeful opportunities to learn about classroom assessment. The key approaches or pedagogies are outlined and discussed with reference to assessment education and online learning environments.

2.8.4 Perspective Building Conversations, Examining Motivation and Learning Theory.

Perspective building conversations (De Luca et al., 2013), involve group discussion with peers of readings, assessment dilemmas and classroom practices. Three features of perspective building conversations were found to be particularly effective in promoting teacher learning. The first aspect was access to the perspectives of the other students. This helped broaden the understanding of classroom assessment. The second significant feature of the conversations was the provision of a common analytical scaffold to guide discussion. Students were asked to approach the discussion from the perspective of a particular stakeholder or theoretical perspective. The group discussions were also structured to promote maximum participation by starting with smaller groups and progressing to whole class discussions. In addition, students were required to articulate and synthesise their own perspective on

assessment by linking assessment theory, terminology and practical classroom experience. Essential elements of assessment theory are the links to motivation and learning theory (Shepard et al., 2005). The third feature of the perspective building conversations that the students found helpful was the metacognitive development that took place as a result of the perspective building conversations. Students reported an increased awareness of how to think about their own conceptualisation of assessment. This it can be argued reflects Loughran (1997, 2007) and Korthagen's (2010) idea of deconstructing a teacher's apprenticeship of observation in teaching and examining prior experience. The student examines their own experience with a view to reconstructing their ideas of assessment through the lens of research for their own teaching and learning in the future.

It is noteworthy that perspective building conversations was reported overwhelmingly as the most useful pedagogy in promoting teacher candidate learning in assessment (De Luca et al., 2013). This finding applied to a pre-service teacher education setting where it can be argued that participants' classroom experience is not as extensive as that of in-service teachers. Also, the use of the phrase "access to other students' perspectives" could imply that the course candidates were aware already that others had perspectives on assessment but unless there is a formal structure in place to allow access to the perspective of others on the course the assessment education is not conducive to promoting teacher learning. It would also suggest a socio-constructivist approach to learning has to feature as an underpinning theory in course development where students are formally engaged in an activity to enact this approach.

2.8.5 Praxis, Assessment Design.

Students were required to debate the benefits and challenges involved in different approaches to assessment and "then pose rebuttal arguments to further situate and problematize these assessment conceptions in relation to classroom practices and practicalities" (De Luca et al., 2013, p. 135). The learning activities that were connected to actual assessment situations that teachers encounter were also found to be effective. It is notable, that the study authors state that they do not consider the pedagogies that formed the class structure to be innovative but that the students considered the approach salient as it helped them establish connections between assessment concepts and revisit concepts through different participant-focused practical activities.

Some of the activities considered helpful to learning included drawing up assessment plans, communicating assessment information to parents, constructing objective and performance based assessments. Although this study focused upon a measurement module tasks related to formative assessment could also be used provided they related to classroom practice and are relevant and authentic. Students valued tasks that help them understand what the assessment procedure would look like in the classroom (De Luca et al., 2013). Prior research has revealed that theory-laden courses that are disconnected from classroom realities and misaligned to current assessment policy have contributed in the past to poor teacher learning in assessment (De Luca & Bellara, 2013). Siegel & Wissehr (2011), in their study of a pre-service course focussed on a formative assessment module, reported that student teachers improved their assessment learning when they had an opportunity to attend theory classes and conduct field classroom observations. They could compare what they

observed in the field to the theories presented and wrote reflective comments in journals. However, it is noteworthy that while the study concluded that the reflective journals contained evidence of strong assessment literacy, when required to carry out practical classroom assessment, students reverted to more traditional approaches they may have experienced themselves as students. This reinforces the notion referred to earlier that knowledge alone about assessment is not an accurate conceptualisation of teacher assessment literacy. Similar to Shulman's (1986) thinking the knowledge must be accompanied by pedagogical skill and pedagogical reasoning. Strong literacy extends into the classroom just as quality professional development must include an evaluation of the teacher practice in a teaching setting. Korthagen (2010) also advocates that teacher learning takes place through reflection on practice not just knowing about practice and Loughran (1997, 2007), highlights the importance of responsive practice from the teacher educator in confronting challenges and allowing student teachers to learn from the process. It seems therefore that praxis needs to be followed by structured reflection and in true assessment spirit a further opportunity to implement the new learning from the reflective process.

2.8.6 Modelling of Formative and Summative Assessment Approaches

De Luca et al. (2013), state that explicit, planned modelling of classroom assessment practices along with explicit instruction on assessment practices formed part of the pre-service module. The findings indicated that such an approach is highly supportive to teacher learning. Specific assessment instruction strategies identified as contributing to teacher learning included assessment warm-up activities, on-going feedback comprising of self-assessment, peer-assessment and tutor feedback, group and whole class discussions to check for understanding and structured opportunities to

provide the course tutor with feedback about the course content and delivery. In the area of modelling, Abell & Siegel's (2009), research into the assessment literacy of science teachers concluded that assessment literacy can be developed through programmes that explicitly model assessment practice based on constructivist learning principles[14]. Another finding from Abell & Siegel (2009), indicated the importance of congruence between the taught theory of assessment and the assessment approaches used by the course tutors. A modelling example that involved candidates sitting a test individually, and then in small groups, was found to benefit teacher learning. It was considered to be a good example of assessment practice while at the same time it was an authentic learning task for the candidates. Developing on this idea Crowe & Berry (2007), argues that a core principle of practice for those learning to teach is experiencing the role of learner. Modelling by experiencing the assessment strategies that the teacher ultimately will use in the classroom, is a recognised pedagogy. Nonetheless, Loughran (1997, 2007) and Korthagen (2010) both argue that modelling without reflection does not result in deep learning. Unless insight is offered in to strategies, the teacher may learn to become technically competent but will be unable to make well-founded decisions about assessment, a necessary element of assessment literacy. It is also worth noting that the modelling of assessment techniques referred to in the literature about learning in assessment all took place in face-to-face settings. This study however, is set in an asynchronous online setting where assessment approaches were modelled through direct experience and video clips.

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[14] Students construct meaning and make sense of the world as a result of experiences. Learning occurs in an interaction between the individual and the social environment (James, 2006) If the assessment practices experienced by the students on a course ….

2.8.7 Critical Reflection

Even though the course participants in the ITE face-to-face setting indicated that critical reflection was not as beneficial as perspective building conversations, praxis and modelling, to learn about assessment the authors put forward the idea that it may be overlooked as an effective pedagogy (De Luca et al., 2013). In that study integrated and structured reflections were undertaken at three points during the course during which students were asked to describe and analyse their learning about assessment and identify areas for future development. Instructors found the data collected form those reflections useful in order to plan course delivery and in turn to develop instructor professional development activities. None of the participants valued critical reflection for their own personal use or for the purpose of course development or instructor professional development. The authors concluded that perhaps the reflective activity needed to be structured differently or that candidates' knowledge of professional development for themselves as teachers was limited and not immediately relevant. This, it could be argued reflects the findings in the area of praxis where candidates indicated that activities related directly to classroom practice were of most benefit in progressing teacher learning. If teacher candidates see no connection between critical reflection, professional development and their practice as a teacher it is perhaps too early in their teacher education process to engage in reflection on professional development. With more classroom experience serving teachers may be in a better position to benefit from critical reflection as pedagogy to develop assessment literacy.

However, Loughran (2997, 2007) and Korthagen (2010), see critical refection as having a different function. De Luca (2013), it can be argued see reflection as a

form of feedback to aid course development and indirectly promote teacher learning. On the other hand, Korthagen (2010), sees reflection as a direct learning tool to be used regularly by the teacher candidate, following practical experiences in order to gain personal insight into their own practice rather than for course designers. Loughran (2007), however, sees reflection as a method of "making the tacit explicit" (p.43). He also views reflection as a joint activity between teacher educator and course participant where the practice of both teacher educator, and participant are examined as a way of "looking into teaching" (p. 45) where such unpacking of practice is a key part of learning to teach. The same can be said of learning to assess in a teaching context. Indeed, Loughran (2006), draws on the work of teacher educator Berry (2004), whose students reported high value in the practice of the teacher educator revealing what they thought they were doing as a teacher and why. Indeed, Cowan (2014), contends that may courses include critical reflection as a pedagogy but fail to teach explicitly students how to engage in critical reflection. As a result, Cowan (2014), believes critical reflection is often ineffective as it is not implemented in a well-researched and planned manner. Indeed, Gorman (2017), has reported that at ITE level, HEI use of synchronous online sessions to reflect on aspects of school placement identified student reluctance to engage in reflection due to prior experience of reflection as onerous and not benefitting learning.

Research on reflective writing has been influenced by the work of Boud, Keogh & Walker, 1985; Kolb, 1984 and Schön, 1983. Reflection and reflective writing can be defined as thinking in which a learner identifies and strives for an answer to a question whose answer, preferably in generalised form, is likely to be of practical use to them in their professional practice (Cowan, 2014). The learner

deliberately thinks about past or forthcoming actions, with a view to implementing

future improvement (Hatton and Smith, 1995). This process can take place within a

written reflective journal and should lead to new understandings and appreciations

(Boud et al., 1985). Much reflective practice nowadays features learning journals

within which writers engage with their learning experiences, and unearth their tacit

knowing (Bickford and van Vleck, 1997).

However, Cowan (2014), states that there are considerable inconsistencies in

the approach to reflective writing with the fault lying in the lack of clear direction

provided by the teacher educator or with a lack of appreciation of purpose on the part

of the learner. Furthermore, he outlines the characteristics of quality reflective

writing. These include reflection-for-action, reflection-in-action and reflection-on-

action. Reflection-for-action (Cowan, 2006), anticipates activity and identifies

possible options, considering between possibilities by questioning and comparing

them. The outcome sought is a considered and viable forward plan. Table 2.8 offers

an outline of the elements of robust self-questioning that Cowan believes forms the

basis of quality reflection. Typical questioning includes phrases such as: What are the

challenges immediately ahead of me? How should I tackle them? How should I decide

how to tackle them? Reflection-in-action (Schön, 1987), entails thinking on one's feet

beyond so-called common sense, being suddenly conscious at the time of what one is

doing and how one is doing it. A common outcome is immediate appreciation or

learning. Typical questioning: What just occurred to me? Can I use that in future?

How? Reflection-on-action is much practised in employment situations. It is

undertaken with hindsight after the events that are being interrogated. The outcomes

sought are transferable learning and understanding. Typical question: What can I learn

from this experience which should make me more effective in situations like this than
I have been in the past? A worthwhile depth of reflection, facilitation and self-
questioning structure are also notable characteristics of quality reflective writing.

Table 2.8   Elements of a Robust Self-Questioning Structure (Cowan, 2014)

Selective Describing	A reflective writer should find it fruitful to identify and explicitly summarise the salient facts of the experience being scrutinised: What is worrying me most about this, and why? What aspects should have most attention from me – and why? For what forthcoming demands should I prepare myself?
Examining from Multiple Perspectives	Connections, inconsistencies and all valid options should be considered.
Self-Challenging and Open to New Insights	Taking time out and digressing to question priorities, assumptions, conclusions and assertions to date can suddenly ignite a question of particular value to the writer.
Forward Planning	Many journal writers find it difficult to move beyond the analysis of an experience to identifying and considering subsequent options. Reflective planning considers suggestions that merit further attention and decides how to carry them forward, according to the writer's priorities and values
Metacognitive Self-Review	Reflection about the reflecting happens when the writer, having developed an internal voice, examines and evaluates the quality and nature of their reflective processes.

2.9 Online Professional Development: The Teacher Learning Environment

In addition to the pedagogies that support assessment learning for teachers, the
actual immediate professional learning environment of the teacher warrants
consideration. Asynchronous online learning, face-to-face settings and blended
learning are the options offered to teachers for professional development in Ireland.
From a learning point of view, the significant meta-analysis of studies comparing on-
line learning and face-to-face learning for older learners (Means, Toyama, Murphy,
Bakia & Jones, 2010), concluded students in online settings performed modestly
better than those in face-to-face settings. In addition, the meta-analysis established
that there was no significant difference in learning outcome between online and
blended settings. Furthermore, Means et al., (2010), proposed a conceptual framework
to refine the explicit categories of online learning environments. Table 2.9 provides an

overview of the classification of online learning activities based on whether they replace or enhance a face-to-face activity or whether the dimensions of the learning experience are expository, active or interactive[15]. Drawing on this conceptual framework, this study is positioned in an asynchronous interactive context delivered to serving teachers as an alternative to face-to-face professional development.

Table 2.9 Conceptual Framework for Online Learning (Means et al., 2010)

Learning Experience Dimension	Synchronicity	Face-to-Face Alternative	Face-to-Face Enhancement
Expository	Synchronous	Live, one-way webcast of online lecture course with limited learner control (e.g., students proceed through materials in set sequence)	Viewing webcasts to supplement in-class learning activities
	Asynchronous	Math course taught through online video lectures that students can access on their own schedule	Online lectures on advanced topics made available as a resource for students in a conventional math class
Active	Synchronous	Learning how to troubleshoot a new type of computer system by consulting experts through live chat	Chatting with experts as the culminating activity for a curriculum unit on network administration
	Asynchronous	Social studies course taught entirely through Web quests that explore issues in U.S. history	Web quest options offered as an enrichment activity for students completing their regular social studies assignments early
Interactive	Synchronous	Health-care course taught entirely through an online, collaborative patient management simulation that multiple students interact with at the same time	Supplementing a lecture-based course through a session spent with a collaborative online simulation used by small groups of students
	Asynchronous	Professional development for science teachers through "threaded" discussions and message boards on topics identified by participants	Supplemental, threaded discussions for pre-service teachers participating in a face-to-face course on science methods

Nonetheless, Means et al (2010), concluded that the learning benefit from online and blended environments were not connected to the technology per se but rather to the actions and input of the moderator. In a similar vein, a literature survey of online learning carried out by Schwartz (2013), concluded that online learning is only a good as the pedagogy underlying the course. Means et al. (2010), also referred to the larger effects achieved when students engaged in instructor led reflective tasks; the inclusion of media content did not enhance learning outcomes. These ideas concur

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[15] *Expository instructio*n is when digital devices are used to transmit knowledge and no interaction is required. *Active learning* is when the learner builds knowledge through inquiry-based manipulation of digital artefacts such as online drills, simulations, games, or microworlds. *Interactive learning* is when the learner builds knowledge through inquiry-based collaborative interaction with other learners; teachers become co-learners and act as facilitators (Means et al., 2010, p.3).

with the meta-analysis carried out by Bernard (2004), who also established that the pedagogy used by the instructor is a predictor of student learning. Meta-analytic pedagogical features included: systematic instructional design, advanced course information provided to students, opportunity for face-to-face contact with teacher and peers, opportunity for mediated communication (e.g., e-mail, chat rooms) with teacher and peers, student-teacher contact encouraged through course design, and use of problem-based learning.

However, one notable weakness in Means et al's (2010), meta-analysis is, despite concluding that pedagogy is the most influential moderator variable on learning, little is done to define pedagogy apart from the deduction that the most successful studies for bringing about learning involved strategies that encouraged individual reflection and engagement. The study would be more useful from a practice point of view if pedagogy had been explicitly defined to be replicated or used as a comparative tool for other online courses. However, in their influential report on the best practice in professional learning and development across all settings, Timperley, Wilson, Barrar & Fung (2007), defined pedagogy as activities constructed to promote professional learning (Fig. 2.8) along with learning processes (Fig. 2.9) which engage course participants in learning. The activities included professional instruction, linking key ideas to teaching practice, activities to enact practice and participation in a professional learning community. The learning processes included consolidation of prior knowledge, introduction of new knowledge and dissonance and repositioning. It was also worth noting that Timperley et al. (2007), concluded the report with what they referred to as "topical issues" that impacted upon the effectiveness of professional development. In particular, teacher knowledge and skill in assessment

that prompted teachers to ask about their own learning and their students' learning led to self-regulation and goal setting. They were reported as being able to bring about sustained change in their classroom practice. A weakness perhaps in Timperley at al., (2007), is to categorise assessment as a concluding issue rather than an integral part of the learning processes and "no core study intervention addressed assessment only" (p. 183).

Professional instruction
- The interventions in all the core studies began with a rationale to engage, followed by initial instruction in the underlying theoretical principles related to pedagogical practices and/or training in procedures (such as assessment) or specific programmes.
- The role of the provider was often to mediate the theoretical messages derived from research, making them available to teachers.

Activities used to link key ideas to teaching practice
- Different combinations of activities allowed teachers to negotiate meaning.
- Construction of meaning involved teachers developing understanding of links between their current and evolving theories and practices and the new professional learning.
- Engaging with selected professional readings, aided by provider mediation of the messages.
- Watching demonstrations of practice (most effective when students were similar to those in teachers' own contexts).

Activities to enact key ideas in the teachers' own classroom
- Activities were effective when there were clear and shared understandings of the theoretical framework underpinning the practice and where multiple opportunities to engage were provided.
- The most frequently used activity consisted of observations and feedback, where teacher practice and provider input were allowed to shape and refine understandings.
- Opportunities to plan collaboratively were successful where there was a clear framework outlining the preferred teaching practices and where data on student outcomes and learning needs were available.

Participation in professional learning communities
- A common element in all the core studies was the establishment of a professional learning community with shared contexts and similar needs.
- Some communities were school-based; others were off-site and involved teachers from different schools meeting for a common purpose.
- Professional learning communities did not always support new professional learning and in some cases served to maintain the status quo.

Figure 2.8 Activities Constructed to Promote Professional Learning Timperley et al., 2007)

Consolidation of prior knowledge

- Consolidation of prior knowledge was not a major aim or emphasis in any of the studies, though in some, new pedagogical knowledge was systematically built around existing curriculum knowledge.

Introduction of new information

- This was the most frequently reported learning process. The new information was deeply situated and usually presented in the form of pedagogical content knowledge together with the theoretical understandings and principles underpinning it. At times, new information generated dissonance.

Dissonance and repositioning

- In those studies that reported dissonance:

  It was usually triggered by demonstrating the greater effectiveness of alternative teaching approaches.

  Teachers became convinced of the value of new approaches when they saw them having a positive impact on the achievement of their own students.

  Teachers gained a greater sense of agency in promoting their students' learning and a reduced sense that outside influences predetermined student underachievement.

Figure 2.9 Learning Processes (Timperley et al. 2007)

Further detail on the pedagogical approaches that bring about learning in an online setting can be gleaned from the influential Community of Inquiry (CoI) framework for online learning settings proposed by Garrison, Anderson & Archer (2000). (Fig. 2.10)
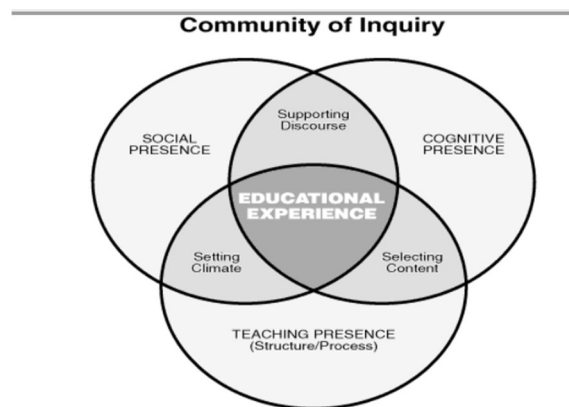
Figure 2.10 Garrison, Anderson & Archer (2000)

The underlying assumption of the framework is that a meaningful online educational experience takes place through interactions among members of a community of inquiry comprised of instructors and students. The framework presupposes that in order for meaningful learning to occur in this community, there is a need for three

forms of presences. These presences are: social presence (SP), characterized by a supportive collegial online environment; teaching presence (TP), defined by instructional organisation appropriate to the online environments; and cognitive presence (CP), which is the degree to which learners can construct knowledge through critical thinking and reflection. The framework posits that these three forms of presence together create a meaningful, collaborative and constructivist discourse that is necessary for high-level learning (Garrison and Akyol, 2011, Garrison and Arbaugh, 2007). This framework has however, been criticised for overstating the role of the social presence in bringing about learning. Indeed, Annand (2011) in his critique has argued the framework over emphasises the social presence and the connected activities namely supporting discourse and setting climate and that more recent research has revealed the importance of the individual learner attributes and teaching processes experienced by the individual to foster learning. Such criticism would seem to concur with Means et al (2010), who concluded that individual reflection and individual engagement by participants resulted in higher levels of learning.

From the literature "presence" online seems to focus on two main rationales: building relationships and scaffolding the learning. Relationships and learning are key parts of teacher education (Loughran, 2007; Korthagen, 2010). Kritzer & Cole (2009), advocate the building of relationships by the use of "getting-to-know-you discussion boards", weekly video messages, synchronous office hours where there a number of pre-set days/times when the instructor will be online in a specified area that permits synchronous conversation. Sheridan & Kelly (2010), refer to "teaching presence" which guides the learning. Indicators of teaching presence include responding in a

timely manner to queries, making course requirements clear, participating in discussions, providing feedback, being empathetic and being friendly. These indicators reflect Korthagen's (2010), idea of the responsive duty of the teacher educator. Without teaching presence, student discussion is characterised by one-way monologues devoid of guidance (Sheridan & Kelly, 2010). It is also interesting to note, that Sheridan & Kelly (2010), made a clear distinction between the "social presence" and "teaching presence" of the instructor. They concluded that a there was a positive relationship between student satisfaction and level of social presence by the instructor. However, high levels of social presence did not result in more learning. Nonetheless, teaching presence was shown to impact upon student cognitive presence. Garrison & Arbaugh (2007), define cognitive presence as the "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse" (p. 161). Cognitive presence has four key phases: a triggering event (a concern is identified for inquiry), exploration (exploring the topic through discussion and critical reflection), integration (constructing meaning from the thinking developed through exploration), and resolution (applying new knowledge into a real-world setting). It can be argued that pedagogy can be defined as the activities and processes that bring about cognitive presence.

This section has provided a brief overview of the literature relating to online learning environments. Significant meta-analyses indicate that overall those involved in online learning, in particular graduate students, have better learning outcomes than in face-to-face settings. Pedagogy rather than technology or media is identified as the most important factor in promoting learning both in online and face-to-face settings. However, the literature on the studies focussing on online settings appeared to lack

explicit definition of pedagogy. In contrast, drawing on the literature on professional development for teachers, pedagogy is outlined in much more transparent manner. The definition offered is the activities and processes that bring about learning. In an online setting, cognitive presence indicates learning, therefore pedagogy can be explained as activities and processes that imply teaching presence but bring about cognitive presence in an online locale.

2.9.1 Assessment Education and Online Learning: Commonalities and Differences

Assessment education and online learning have commonalities and differences. A significant commonality is the necessity to meet the needs of adult learners as Zepeda, Parylo & Bengtson (2014), argue all professional development for teachers should be linked to andragogy and, in addition, the professional development activity should be examined through the lens of andragogy ensuring that the characteristics of effective adult learning are present. The characteristics of adult learning activities incorporate self-directed learning, motivated participants, problem centred approaches, relevance to professional context and goal orientation. The characteristics of andragogy have been explored previously in greater detail in section 2.5.

A second similarity between effective assessment education and effective online education is the provision of structures to facilitate discussion and critical thinking. Leahy & Wiliam (2009) note that professional development for formative assessment is effective if discussion and critical thinking are planned activities built into each session. Quality learning experiences online foster critical reflection and discussion (Reushle & Mitchell, 2009; Means et al., 2010). A third parallel in assessment education and online learning is the concept of authenticity. Authentic

online learning experiences ensure that "the tasks align with real-world tasks of professional practice" (Reushle & Mitchell, 2009, p.16). Similarly, quality teacher learning in assessment is based upon classroom-focused inquiry orientation firmly rooted in the real-world obligations of a teacher's professional practice of assessment (Pedder & James, 2010). The highlighting of authenticity as a similarity reflects the adult learning theory characteristic of learning being relevant to professional context.

2.9.2 Synchronous and Asynchronous Learning

Two significant differences between assessment education and online pedagogies are, the capacities of asynchronous learning and the impact of prior experience of the use of online learning settings. Asynchronous learning is where students access material in their own time and the students are not required to be together at any time. This is in contrast to synchronous learning where all participants are present at the same time. Online settings allow for the use of both types of learning approaches. However, given the role of interaction in online learning and student success (Kelly, 2012) it can be argued that facilitating interaction is the main factor to consider not whether the learning is synchronous or asynchronous. However, structured interactive asynchronous[16] learning where students are required to respond to other students rather than just access course material and respond leads to deeper level of engagement than face-to-face or online synchronous learning (Northey, Bucic, Chylinski & Govind, 2015). Discussion and critical thinking regardless of the setting are central to assessment education (Leahy & Wiliam, 2009), and this must

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[16] Interactive asynchronous online professional development is defined by Means et al. (2010) as an online activity with a time lag between the presentation of instructional stimuli and student responses with interaction between students, between facilitator and students and between students and course content.

underpin synchronous and asynchronous learning environments. Coppola, Hiltz &
Rotter (2002), in their study of asynchronous learning networks concluded that a more
Socratic[17] based pedagogy emphasising discussion and critical thinking is required to
be an effective educator in asynchronous online settings.

2.9.3 Prior Online Experience

Prior online experience by the student is less of a factor in student learning
than previous studies indicate. This is due to the prolific nature of computer use by
students (Jan, 2015). However, Adnan & Boz (2015), suggest the prior experience of
the teacher educator of teaching in an online environment has more of an impact on
student learning than student experience of online learning. The literature indicates
however, that teacher educator experience alone in an online setting may not be
sufficient. Key theorists in the area of using technology to teach teachers, contend that
the conceptual framework used to describe the knowledge base needed to teach
effectively with technology is known by the acronym TPACK (Thompson & Mishra
2007). The acronym TPACK stands for Technology, Pedagogy and Content
Knowledge, elements indispensable to teaching (Voogt et al., 2013). Not alone does
the teacher educator need secure subject or content knowledge and robust pedagogical
knowledge; knowledge of technology is also required.

Indeed, Kemp & Giskin (2014), argue that the online educator must have a
clear understanding of the difference between the features of the technology used, and
the affordances for teaching of technology. For example, an online forum as a tool can

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[17] The Socratic Method refers to a type of pedagogy employed by Socrates in the Platonic dialogues. It
is a way of engaging ideas through discourse and consists of five stages: 1) Wonder, 2)
Hypothesis, 3) Elenchus (refutation and cross-examination), 4) Acceptance/rejection of the
hypothesis, and, 5) Action. It is a systemised question and answer process directed by the
teacher but dependent upon student engagement in the form of co-operation and dialogue.
Such an approach is used to teach critical thinking.

allow the uploading of text. However, an affordance of an online forum is the facility to document a change in thinking of the student. Woodward & Machado (2017), identify the use of video as a tool to allow teachers to view the practice of others. Nonetheless, they state video has the affordance to promote reflection by encouraging teachers to "compare video clips of their practice with their written beliefs about teaching and learning" (Woodward & Machado, 2017, p. 51).

Elliot (2017), in a narrative review of a hundred and seven studies of the evolution of professional development for teachers, right through to online professional development, also describes the affordance of social interaction through email, threaded forums and news groups. Holmes, Signer, and MacLeod (2010), refer to the affordance of social interaction and the affordance of teacher presence brought about by email and moderated forums. The affordance of interaction through forum contributions, email and reflective journaling can be subdivided into three principal types of interaction. These are student to student interaction, student to teacher interaction and student to content interaction (Annetta, Cheng, & Holmes, 2010; Aranda, 2011; Bradley, 2011; Nandi, Hamilton, & Harland, 2012). In addition to affordances, the awareness of constraints or limitations of online tools must be present in the facilitator. Interestingly, Elliot (2017), cites the lack of skill and knowledge on the part of the course provider or facilitator as the principal constraint of online professional development. However, Freidhoff (2008), argues that each aspect of technology has an affordance and constraint, and these must be known to the course facilitator or teacher educator. For example, Freidhoff (2008) cites the difficulty for a student teacher keeping track of their own thinking and contributions on a forum, as all contributions are made by topic and scattered throughout topics. He argues it is a

constraint of forums as it prevents student teachers from monitoring their own

thoughts from contribution to contribution and developing as reflective teachers.

Taking Elliot's (2017), view that the main constraint online is the lack of knowledge

of the facilitator, the depth of knowledge of the facilitator of affordances is central to

online professional development. This reflects Friedhoff's (2008) three-step model of

evaluating technology for use during teacher education. The three steps included

identifying principles of the learning task to be supported by technology, evaluating

the affordances and constraints of specific technologies against these principles, and

assessing technology implementation by referring back to the principles of the

original learning task.

Cook & Thompson, (2014) suggest that providing students with quality online

teaching and learning outweighs lack of prior experience by students in enhancing

learning. Elliot (2017), also highlights the necessity for the use quality instructional

design by the facilitator-researcher, defining quality instructional design as

"professional development rooted in educational theory and best teaching practices"

(p.119). In addition, student academic competence is a more important factor than

prior online learning experiences (Jan, 2015). The expertise of the teacher educator in

instructional design and knowledge of affordances and constraints of technology

combined with the academic competence of the student, impact more on student

learning than prior online experience.

2.10 Conclusion

The reasons why teachers require competence in assessment are threefold.

Firstly, assessment skill by the teacher helps to ensure learning has taken place for the

student. Secondly, teachers skilled in the use of assessment are able to negotiate the

highly political assessment landscape that is unfortunately the reality for teachers.

Thirdly, teachers with strong assessment capabilities are in a position to influence others about conceptualisations of assessment that benefit students and schools and not political systems.

Using assessment knowledge and selecting appropriate assessment strategies are core professional competences stipulated in many policy documents. However, assessment policy at local, national and international levels also shapes teacher practices in assessment in the classroom. Teachers operate in environments often dominated by neoliberal, performativity influenced testing systems and new managerial inspection procedures. However, a shift in policy aspiration is evident with the publication of the ESSA (2015) alongside increased awareness of the strong link between socio-economic factors and standardised test results. In addition, there have been calls for a more varied approach to the collection of assessment data. However, the reality of classroom practice in assessment for teachers has not seen the same shift.

The policy space now exists for a change in the classroom approach to assessment, but this policy space is of no consequence if teachers are not afforded the opportunity to engage in professional development. In an Irish context asynchronous online professional development is widely accessible to all teachers. If this method of professional development is of high quality, there will be two outcomes. The first is to counter psychometric cultural legacy. The second outcome of quality professional development is to progress and expand teachers' professional practice of assessment. This will give teachers the knowledge and skills necessary to operate and critically

evaluate practice in an environment where change is called for but cannot be operationalised.

Professional development, however, is ineffective unless it is grounded in research, in particular, the pedagogies employed by the teacher educator, as Loughran (2006), argues, pedagogy is the most powerful tool to change teacher belief and practice. Teacher learning is nonetheless a complex process influenced also by personal teacher attributes, teaching environments, local, national and international policy contexts. Even allowing for the complexities of teacher learning, it is teacher knowledge and beliefs about assessment that appear to have the strongest influence on classroom practice. In order to develop teacher knowledge, and beliefs that translate to practice quality research based professional development in assessment is a necessity. In an online setting, the most important factor is the teacher educators' knowledge and experience of effective online pedagogies that promote critical thinking and interaction and in turn lead to new thinking that will influence classroom practice. Aspiring to quality research based professional development is laudable, however, implementing such a programme requires deep understanding of the processes that result in teacher learning and changes in classroom practice. Without research into the pedagogical approaches that facilitate teacher learning in an online environment, the opportunity now emerging through policy and education commentators to develop and implement quality assessment practices in classrooms will be lost.

Chapter 3 - Methodology

3.1 Introduction

Identifying a research design causes the researcher to explicate their view of the world, how knowledge is created and how data is created and presented (Mertens, 2010; Creswell; 2009). This chapter outlines the design and methodology employed in this study. Fig. 3.1 provides an overview of the methodological framework indicating the use of an explanatory case study approach with non-probability sampling and data collected from several sources, during an asynchronous online professional development activity in classroom assessment. In addition, Fig. 3.1 provides insight into the data sources used to answer the research questions. Following on from the methodological framework is a section on the background to the research questions and the conceptual framework used to support the research. This chapter offers a rationale for the use of the explanatory case study method. Finally, data collection instruments, sampling, data analysis, ethical considerations and limitations are addressed.
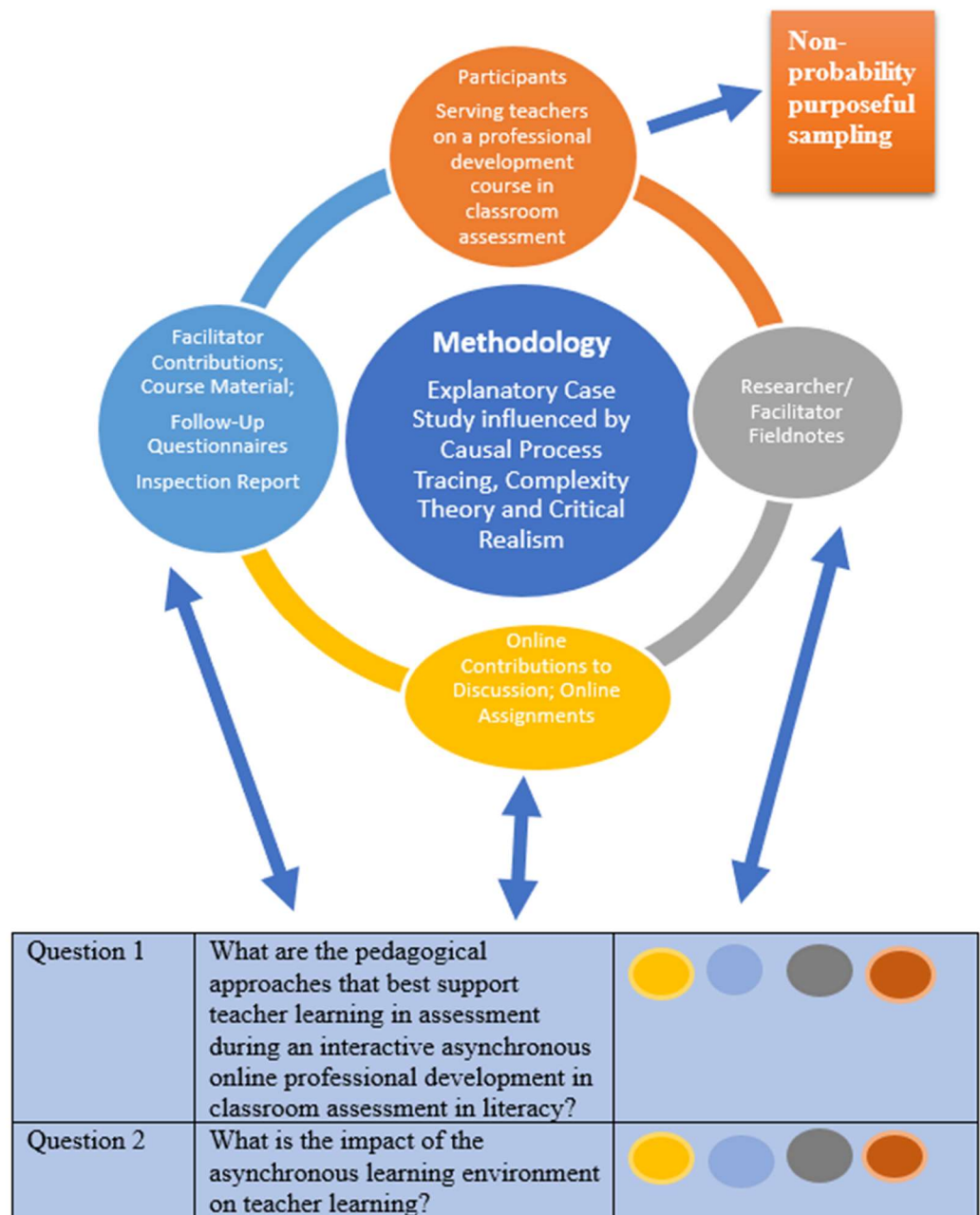
Figure 3.1Methodological Framework

3.2 Background to the Research

Strong assessment capacity is a core professional skill requirement necessary

for effective teaching and learning (TC, 2011; Gardner, 2010; Popham, 2011).

Teacher learning in assessment, develops over time as teachers gain both the

necessary theoretical knowledge and classroom experience. Lysaght & O'Leary (2013), argue that a key part of teachers becoming informed and skilled in the use of assessment, is access to research based tools or audit instruments to allow teachers to evaluate their own classroom practice. However, it can be argued that evaluation of a teacher's own practice needs also to be linked with professional learning opportunities in classroom assessment. Otherwise, the evaluation of teacher practice in assessment may not have any impact upon practice. Such professional learning opportunities should also be grounded in research. Professional learning for teachers can take several formats. This study focuses on an interactive asynchronous[18] professional development activity in assessment. In particular, the study centres around the research questions:

1. What are the pedagogical approaches that best support teacher learning in assessment during interactive asynchronous online professional development in classroom assessment in literacy?

2. What is the impact of the interactive asynchronous learning environment on teacher learning?

The work draws on theoretical concepts and literature from the areas of assessment, teacher education pedagogy, assessment education pedagogy, online pedagogy and the continuing professional development (CPD) of teachers. Teacher learning is a complex phenomenon (Loughran, 2006; Berry, 2004; Cochran-Smith, 1999) and specifically, teacher learning for in-service teachers is more variable than pre-service learning (Day & Gu, 2007; Fraser, Kennedy, Reid & McKinney, 2007).

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[18] Interactive asynchronous online professional development is defined by Means et al. (2010) as an online activity with a time lag between the presentation of instructional stimuli and student responses with interaction between students, between facilitator and students and between students and course content.

Traditional experimental research methodologies may not always be appropriate for research in this area due the complexity of the phenomenon and the lack of control over variables. A case study method may be more suited. Yin (1989), argues that the use of case study research is an empirical inquiry that seeks to investigate a phenomenon within a real-life context where the boundary between the phenomenon and the context may not be apparent. Yin (2012), points out that the researcher needs to match the type of case study to the research question. This case study attempts to define the pedagogical conditions that lead to particular teacher learning outcomes. Therefore, an explanatory case study method rather than a descriptive case study method may be more suited. Such an approach has been used to research complex systems in the fields of business, public policy and urban planning (Fisher & Ziviani, 2004), but Yin (1994), has advocated the use of the explanatory case study approach in the social science disciplines such as psychology, sociology, social work and education.

3.3 Conceptual Framework

The conceptual framework helps to focus the research process, informing the methodological choice and data collection. Miles & Huberman (1994), state that a conceptual framework is a representation of the researcher's view of the territory. An overview of the conceptual framework used to investigate teacher learning in assessment during professional development is provided in Fig 3.2.
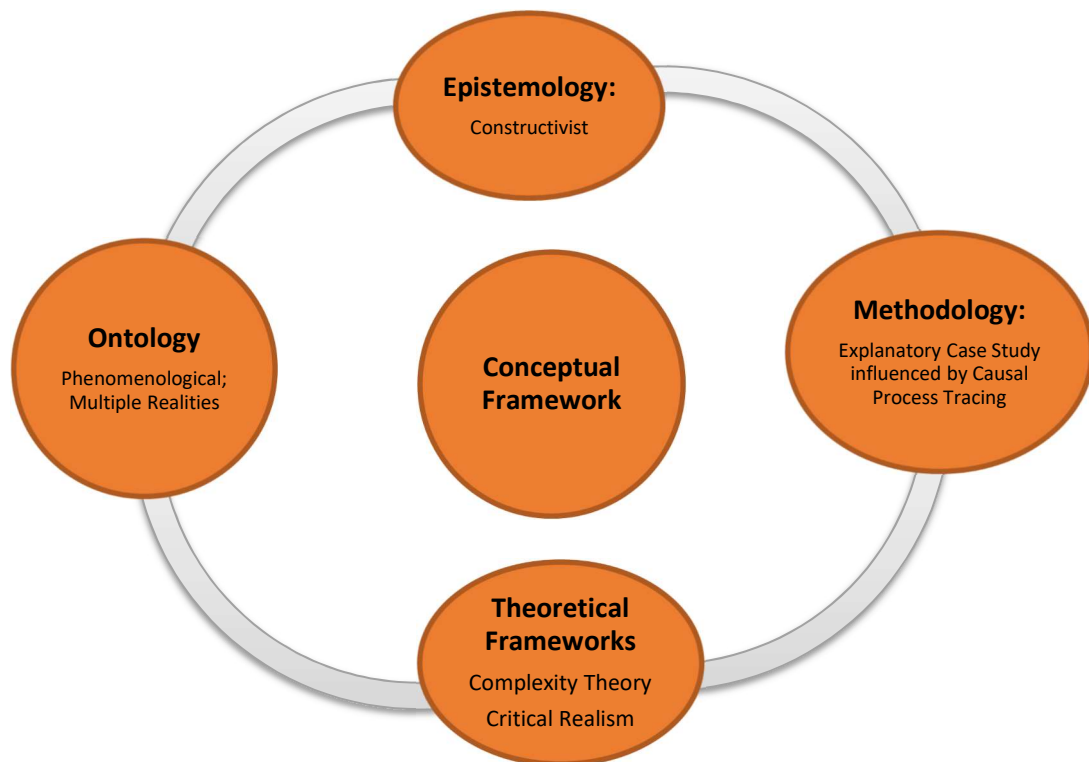
Figure 3.2 Conceptual Framework

The epistemological stance and ontological stance adopted are informed by a constructivist paradigm. Epistemology is concerned with how knowledge is generated and ontology focuses on the nature of reality. Creswell & Plano-Clark (2011), define epistemology as the relationship between the researcher and what is being researched. In this study, the researcher was close to the data site and participants, but data was collected to represent different perspectives. Constructivism states that knowledge is socially constructed by the people involved in the research activity (Mertens, 2010). It is predominantly "associated with qualitative approaches to research and understanding the meaning of phenomena formed through participants and their subjective views" (Cresswell & Plano-Clark, 2011, p. 40). It also holds that there are multiple realities and data collected provides evidence of different perspectives. Table 3.1 presents a brief summary of the key elements of the four main worldviews encountered in research contexts. It is worth noting that Crotty (1998), holds that

these stances are not watertight but offer a general orientation to a study and a constructivist stance in general was the most suited to this study. The use of an exclusively inductive methodology did not prove suited to data analysis and as discussed later elements of the deductive approach were necessary.

Table 3.1 Characteristics of Four Worldviews used in Research (Cresswell, 2009; Cresswell & Plano-Clark, 2011)

Post Positivist Singular Reality	Constructivist Multiple Realities	Participatory Political Reality	Pragmatist Singular and Multiple Realities
Determination, unbiased	Understanding, bias present.	Political, negotiated.	Consequences of actions, multiple stances.
Reductionism	Multiple Participant Meanings	Empowerment and issue Orientated	Problem centred
Empirical observation and measurement. Deductive methodology	Social and historical construction. Inductive Methodology	Collaborative. Cyclical review of data involving participants	Pluralistic Combining quantitative and qualitative
Theory Verification	Theory Generation	Change Orientated	Real-World Practice Oriented

3.4 Teacher Learning

Teacher learning, according to the literature, particularly after ITE is varied and inconsistent. The emerging literature on teacher learning in assessment has focussed upon pedagogical approaches that support teacher learning at ITE level but this study focuses on the learning of serving teachers. Indeed, Popham (2004, 2011), has argued that additional research into pedagogical approaches may contribute to more developed assessment literacy in teachers.

Two main ideas underpin this study. The first is the paucity of research in the pedagogies that result in effective teacher learning about assessment during professional development activities. The second idea that underpins the study is drawn from the seminal work of Loughran (2006), which states that pedagogy is the predominant force that leads to teacher learning and ultimately change in the

classroom. In addition, the role of the researcher as teacher educator an online facilitator-researcher adds another perspective to the research. The researcher believes that teacher learning cannot be considered in isolation. Teacher learning is complex and teacher educators are dealing with multiple influences in conjunction with the use of effective pedagogies. The pedagogical approaches best suited to teacher learning are only part of a complex system. Opfer & Pedder (2011), believe that professional development programmes are ineffective because they focus on individual aspects of teacher education in isolation and fail to take account of the fact that teacher learning is deeply embedded in the lives and working conditions of the individual teacher. Hetherington (2013), argues that a researcher located within the teaching and learning site should choose complexity theory to reflect the messiness of the context.

3.5 Complexity Theory and Teacher Learning

Opfer & Pedder (2011), adopted a complexity theory framework to review literature on teacher professional development practices and the impact that learning experiences have on teacher knowledge and changes in classroom practices. Also, they emphasised that research into teacher learning must go beyond identifying a list of effective professional development processes that result in teacher learning. Rather, explanations must be developed why teacher learning may or may not occur as a result of professional development activity as opposed to evaluating a specific programme or learning technique. Three overlapping and recursive systems (Opfer & Pedder, 2011), are linked to teacher learning: the individual teacher, the school and the teacher professional learning activity. These systems intersect and interact and may or may not result in teacher professional learning. Furthermore, they argue that the complex and non-linear nature of teacher learning should impact upon how research into teacher learning is conducted. This is reinforced in the work of Walton,

Nel, Muller & Lebeloane (2014), whose study illustrates the complexity of teacher learning. Both studies reflect the thinking of Carless (2005), who suggests that there is a three-level framework which influences assessment practice.

- Level One is the personal domain of the teacher and relates to the beliefs and practices of the teacher.

- Level Two is the micro level change environment which is affected by the school support and parental beliefs and values.

- Level Three is the macro level change environment made up of factors such as societal teaching, learning and assessment culture, reform climate, impact of governmental or quasi-governmental agencies, and role of high-stakes tests.

Davis & Sumara (2012), argue that complexity theory is at point where it can be of great use to educators, particularly those in teacher education as they are simultaneously dealing with multiple levels of organisation, dynamics and complex associations. The organisations that can affect teacher education are individual learners, classrooms, schools, school districts and society. In an Irish context, individual teachers are not required to undertake professional development in assessment but teach in classrooms where standardised testing is mandated by national policy (DES, 2012). Furthermore, the co-specifying dynamics (Davis & Sumara, 2012), between teachers and learners and between knowledge and action are part of the teacher educator's system. Complexity theory rejects the idea of linear and causal models of understanding phenomena, but regards phenomena as having non-linear and interconnected components. Non-linear behaviour results in a lack of predictability; the causes and effects are multiple and often independent, although

underlying patterns can possibly emerge within the system (Johnson, 2007). Teacher

learning is regarded as a non-linear process. In contrast, with a complex system,

complexity is displayed at the level of the system itself; it results from the interactions

and nonlinear relationships of constituent parts and from feedback loops in the system

(Cilliers, 1998).

Stanford, Hopper & Star (2015), argue that complexity theory cannot be used

as a conceptual framework for educational research without mapping features of the

terrain under research to key features of complexity theory. They suggest the

following framework to aid mapping. Table 3.2 offers a summary of the key factors of

complexity theory as they apply to this study informed by the framework proposed by

Sandford et al (2015).

Table 3.2 Mapping the Features of Complexity Theory (Stanford, Hopper & Star, 2015) applied to Professional Development Activity in Assessment (Adapted from Davis & Sumara, 2006; Ramiah, 2014)			
Term	Key Aspect	Features from this study: Online Assessment Professional Development Activity	Data Collection
Self-Organised	Interaction leads to transformation; Not centrally controlled	Student interaction with each other, with course material and with facilitator-researcher. Students specify learning objective related to their teaching context	Online interaction from discussion boards; Assignment posts; Survey
Emergent Qualities	Quality arises from the synergy of factors	Teacher learning emerges from the sharing of practice the interaction through discussion of practice, policy and research. Individual teacher beliefs and attitudes influence interaction. Learning emerges through shifting beliefs about assessment and accountability.	Online discussion posts; Reflective Journal Posts; Response to Academic Readings Assignment Posts Questionnaire; Individual Facilitator-researcher Emails Observing practice; Classroom Artefacts
Short Ranged Relationships	Close Interactions; Group Coherence	On-going connection between students and facilitator-researcher; Electronic forum to create coherence; Scheduled contact; Social presence.	Online postings from discussion boards; Facilitator-researcher Postings to Create Social Presence, Individual Facilitator-researcher Emails
Nested Structure	Students Nested within an Overall Structure	National Policy of Teacher Education; National Structure of Online Professional Development; Course Nested within Assessment Policy Context; Course structure nested with National Qualification Framework; Course Content nested with the reality of classroom practice, WSE reports, school based policies and school based culture and beliefs.	Course material & Resources; Online discussion; Policy Documents; Assignment Postings.
Ambiguously Bounded	Complex forms Open; In flux with Surroundings; Adapting through feedback loops	Continuous link with discussion of classroom practice and planned future assessment practice	Online discussion content. Individual emails from facilitator-researcher
Organisationally Closed	Retain own identity; Constantly Interacting; Exchange energy and matter with their dynamic contexts	Course maintained focus on developing teacher assessment in literacy but relating to teachers' individual context; Common understanding of having strong assessment skills while maintain a sense of the individual teaching context.	Course Materials; Facilitator-researcher Responses; Assignment Postings
Structurally Determined	Behaviour limited by structure; To survive change from successive autonomous restructuring	Students select assignments with reference to class level, school structure and context needs. Assignments are determined by choice of accreditation level e.g. Summer Professional learning, Masters, Professional Diploma	Assignments; Facilitator-researcher Contributions
Far from Equilibrium	Always in Flux	Curriculum of Course is dynamic and responds to policy changes, student feedback and current research	Reflective Journal; Participant / facilitator-researcher emails

3.6 Complexity Theory and Critical Realism

There are drawbacks to using complexity theory in education. Cochran-Smith, Ell, Ludlow, Grudnoff & Aiken (2014), argue that the usefulness of complexity theory as a conceptual framework in education should be questioned for three reasons. The first difficulty they point out is that complexity theory yields primarily post-hoc descriptions or "stories of what has happened" with limited use to inform policy and practice in teacher education. The second difficulty is that given its rejection of linear causality it cannot provide explanations to drive practice. Thirdly, they claim complexity theory is value free and does not recognise power inequalities and therefore is not suited to educational research. They suggest the use of Critical Realism alongside Complexity Theory as conceptual framework for teacher education research as it allows the rich holistic view of education and the potential to explain phenomena. As teacher learning at in-service level is regarded as complex and influenced by more factors than teacher learning the use of critical realism alongside is very suited to this study.

Critical realism is a philosophical viewpoint that studies how human action interacts with the enabling and constraining effects of social structures (Houston, 2010). Corson (1991), argues that critical realism can be enacted in an educational research context by using a discovery approach. The discovery approach in educational research consists of a structured approach with four discrete stages (Corson, 1991). The first stage is that an effect is identified and described in this case the effect is teacher learning in assessment. Then a creative model of the 'mechanism' is proposed as an explanation i.e. the pedagogical approaches used during professional development. Stage three involves isolating instances of the mechanism and observe the mechanism in action and collect data to eliminate alternative mechanisms. Finally, the postulated mechanism becomes available as evidence followed action to replace

unwanted with wanted mechanisms i.e. visible use and explication of pedagogies used during online CPD in assessment.

Critical realism was originally proposed by Bhaskar (1978; 1997), and sees reality as layered. Table 3.3 identifies and defines the features of critical realism alongside an indication of how the features of critical realism apply to this study. Critical realism is also referred to as a stratified ontology. Bhaskar's critical realism holds the idea that, in order to understand and change the world, structures and mechanisms must be identified (Corson, 1991). Critical realism seeks to explore causative mechanisms for what is experienced and observed. Bhaskar (1978; 1997), argues for three levels of ontology or nature of being: the empirical, the actual and the real.

Dyson & Brown (2005), argue that the 'empirical' reality is what can be measured and liken it to the branches of a tree that can be seen by a viewer over a wall. 'Actual' reality is like a tree trunk behind the wall and is what is known but cannot be seen by the viewer. 'Real' reality is comparable to tree roots; they are hidden but necessary for the empirical and actual reality. Bhaskar (1978; 1997), also states that the 'real' reality underpins the 'actual' and contains 'generative mechanisms' that contribute to our understanding of the 'actual' reality but which are not completely explanatory. They are referred to as tendencies or causative agents. Fletcher (2016), states that the real level consists of causal mechanisms within structures that cause events at the empirical level to occur. Critical realism holds that phenomena cannot be studied in isolation (Walshe & Evans, 2014).

The combination of complexity theory and critical realism accommodates the situated nature of teacher learning which implies that teaching cannot be separated from the context in which it takes place. Although Cochran-Smith et al. (2014), have focussed on initial teacher education as a complex phenomenon, teacher learning through professional development is

still suited to the lens of complexity theory and critical realism as learning during teacher professional development is more varied than at pre-service level (Tang, 2010). Given that Complexity Theory and the Critical Realism form the conceptual framework for this study data collection must ensure that the features of each are evident in the data gathered.

Table 3.3 Features of Critical Realism Bhaskar (1978; 1997) as mapped to this study

Critical Realism Domain	Description	Features of this Study
Empirical Domain	Empirical Evidence of Events Event is actually experienced and observed Teacher Learning change of practice, belief or knowledge of assessment Cognitive Presence No learning is evident	Open ended questionnaire contributions; replies to postings in online discussion boards; online postings in response to reflective questions; response to theoretical readings; responses to survey evaluating participants' current practice in assessment; individual email between facilitator-researcher and student
Actual Domain	Actual Events Actual Level: Events that occur whether observed or not. They are generated by the mechanisms. Teacher Reading, Viewing Material, Composing Responses, Cognitive Presence.	Participants prior experience of Assessment Education; Individual Participant Teaching Context; School culture; parental expectations; participant motivation; DES Summer Course Guidelines; University Requirements; CPD National Policy
Real Domain	Generative Mechanism: Real Level: Mechanisms that cause events at Empirical Level Pedagogical Approaches during course that lead to teacher learning, activities and processes that result in teacher learning.	Choice of instructional approaches; Discussion; Facilitator-researcher Probes; Planning for Classroom Practice; Responding to Theoretical Readings; Refection on Teacher Learning; Quizzes; Examining Current Classroom Practice; Facilitator-researcher Reflection on Practice; Facilitator-researcher's use of Formative Assessment Approaches

3.7 Rationale for Case Study Design

Traditional experimental research procedures may not be suitable for researching complex phenomena such as teacher learning (Yin, 1994). A qualitative case study approach may be more suitable but Yin (1999), argues that there may be a lack of rigour and difficulty in the generalisation of such findings. However, Ziviani & Fisher (2004), state that such a view is based upon a limited and conventional view of the nature of a case study approach to research, where case study is perceived as descriptive and exploratory. Descriptive case studies describe interventions. Explorative case studies explore situations where there is no single outcome. Explanatory case studies seek to explain causal relationships that result in an outcome. In this study, the outcome of teacher learning in assessment through online professional development is being examined. Teacher learning is a complex phenomenon and cannot be attributed to one factor. Teacher learning is affected by several factors including the pedagogical approaches used during online learning. Stake (1994) believes

generalisability to a population is not considered necessary or relevant in a case study. Uniqueness of a case selected for study is the principle criteria (Cresswell, 1998). Descriptive and exploratory case study approaches also allow research to be conducted where previous research to guide the enquiry is limited (Ziviani & Fisher, 2004). However, if case study research can be used to extend to a population it will be of more use to teacher learning. It will help provide further insight into the pedagogical approaches and conditions that support teacher learning about formative assessment in an asynchronous online course format and may then provide a framework for asynchronous online assessment education. Description can progress to answering "how" and "why" questions. Answering "how" and "why" questions as part of the explanatory case study approach (Yin, 1999), it can be argued is very suited to research into teacher learning in assessment as it is recommended for settings where multiple variables which cannot be controlled are an unavoidable impediment. Multiple variables such as pedagogical approaches and student characteristics are features of online learning environments.

3.8 Characteristics of Explanatory Case Study Research

Yin (1994), a key developer in case study research, provided a theoretical framework supporting the applicability of explanatory case studies as a valid and rigorous research methodology. Yin (1999), listed eight desirable characteristics for a rigorous explanatory case in research conducted in a healthcare setting. These characteristics, it can be argued, provide a framework for establishing the rigour of the explanatory case study approach in an education setting. It is important to bear in mind that the framework can serve as a guide rather than a rigid framework. Table 3.4 offers a summary of each of the eight characteristics associated with the explanatory case study approaches used in healthcare. The table (3.4) also provides a short analysis of the features of this study to offer a rationale for the use of the explanatory case study approach. The characteristics necessary to ensure rigour in the

explanatory case study approach are a structured case design, the ability to generalise, a clear case description and clear procedures to operationalise the design. Also included in the characteristics of rigorous explanatory case study include maintaining discovery and flexibility, exploring rival explanations, triangulation and distinguishing evidence from interpretation.

Table 3.4 Characteristics of Explanatory Case Study (Yin, 1999)

The Case Study has a Research Design: Case studies are concentrated focus on a single phenomenon. Qualitative and quantitative data are important for data analysis. However, methodological choice may be restricted by participant numbers. Nonetheless, the more structured and purposeful the approach the more rigorous the explanatory case study is deemed to be

Generalising from case studies. Each case may be considered equivalent to a single experiment (Yin, 1999) and multiple cases could be viewed as like multiple experiments. Other online professional development activities in assessment can be investigated.

Identifying the case. The formulation and description of a theoretical model or principles prior to data collection provides guidelines for defining the case (Yin, 1999). This ensures that the findings reflect the true case under investigations and provide a structure for comparison. The case in this instance involves a five module online professional development course in formative assessment. This type of online professional development is a single case design "representative or typical case" (Yin, 2009) as it is a widely-used model of professional development in an Irish primary Education context.

Operationalising the case study. In keeping with quantitative research, explanatory case studies need to have key research priorities, topics and concepts defined within a complete and thorough framework. This ensures that both the required and accurate information collected through suitable data collection method, enabling the research questions to be answered.

Maintaining discovery and flexibility. Even though a comprehensive framework of concepts and topics is necessary, a unique component if the explanatory case study is flexibility. This means that the process of case selection allows for the researcher to discover and test as sampling is part of the ongoing process.

Using rival explanations as a design strategy. testing of 'rival explanations' for competing themes and explanations. The case study analysis is more rigorous if plausible explanations are tested. In the case of assessment, it can be difficult to ascertain whether the knowledge of assessment has been learned originally elsewhere. In this instance tasks are designed so as students need to demonstrate application of knowledge rather than existence of knowledge. explanations must be developed as to why teacher learning may or may not occur as a result of professional development activity as opposed to evaluating a specific programme or learning technique

Triangulation. This means that data is collected from multiple sources such as questionnaires, course documentation, individual emails, artefacts and follow-up questionnaires No one method can accurately provide satisfactory information for testing rival explanations. The existence of rival explanations and the acknowledgement of such a phenomenon is very important to establish validity and reliability in an explanatory case study.

Distinguishing evidence from interpretation. Experimental inquiry protocol requires that evidence or results should be presented independently of the researcher's own interpretation of the data. Traditional case study research has been presented in narrative format. The use of a case study data base is recommended into which data is collated so they can be presented separately from interpretations, thereby allowing more rigorous critique and analysis by others. This is facilitated using NVivo 11 (QSR, 2015) so that the data collected can be presented and inspected separately from the researcher findings. Yin (1999) also highlights the importance of a comprehensive literature review prior to data collection to reflect previous research and develop a theoretical model. Once again, the use of NVivo 11 has partially facilitated the formation of a literature review. Non-electronic sources are referred to individually.

3.9 Explanatory Case Study Model

Fisher & Ziviani (2004), expanded upon the work of Yin (1999), to develop a model "to depict the systematic explanatory case study approach of Yin and illustrate how case studies can be used to explain and inform theoretical models" (p. 189). Furthermore, they argue that the model can be used as a benchmark against which the explanatory approach can be evaluated. Sato, Fisette & Walton (2013), used an explanatory case study approach to describe and explain the experiences of African American Physical Education Teachers in secondary urban schools. The study focussed upon how candidates developed both conceptual understandings and specific practices for teaching physical education to that specific context. The authors argued that because the study was an explanatory case study design situated in a descriptive-qualitative methodology it was best suited to understand and explain a complex educational or social phenomenon. Yin (2003), also maintained that the explanatory case study approach preserved the holistic and meaningful characteristics of real-life settings. Explanatory case study is also suited to research locales where there are many variables that are beyond the control of the researcher but nonetheless are of interest to the phenomenon under research.

An explanatory case study approach relies on explanation building by identifying a set of causal links. Yin (2014), argues that the causal links are used to build explanations[19] and can offer critical insights into public policy and can lead to recommendations for future policy actions about teacher learning and professional development. Currently in Ireland continuing professional development policy is under review with the aim of developing a framework for practice. Alongside the framework development undertaken by the Teaching Council is a reform plan now being implemented by the inspectorate (DES, 2012). This

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[19] Explanation building is also referred to as process tracing or causal process tracing (CPT). The researcher starts with the assumption that a plurality of factors work together to produce an outcome.

reform plan includes active promotion of "encouraging better use of different forms of assessment in schools and more effective analysis and use of assessment information at school level and on a national level" (DES, 2012, p.20). Thus, a study of the kind proposed here could contribute valuable knowledge for policy formation in the area of the provision of online education about course structure, pedagogical features and professional development of facilitators. An explanatory case study can be used to describe and explain how teachers develop conceptual understandings and specific practices in teacher education (Sato, Fissette & Walton, 2013). Developing specific practices of assessment literacy in teachers is a complex and non-linear process. In order to be considered assessment literate a teacher should develop conceptual understandings and specific practices in classroom assessment (Abell & Siegel, 2009). The outcome of developing teacher assessment literacy is dependent upon several variables (McGee & Colby, 2014; Popham, 2004, 2011; De Luca et al., 2013) including characteristics of the learner, location of the assessment education, method of delivery and pedagogical approaches employed by the assessment educator. It can also be argued that the outcome of teacher learning in assessment is also dependent upon how the teacher transforms the learning into classroom practice and demonstrating the new learning (Shulman, 1986). Therefore, follow-up interview data is necessary to investigate teacher learning.

3.9.1 Explanatory Case Study Designs

The explanatory case study approach is a broad term and has three distinct approaches. Blatter & Haverland (2014), subdivide the explanatory case study approach in small scale studies into three distinct categories: the co-variational approach (COV), the causal tracing process approach (CPT) and the congruence analysis approach (CON). Table 3.5 identifies the features of each explanatory case study approach and compares the individual attributes. The approaches are distinguished by their research goals, their focus,

and selection of cases, data generation, data analysis and the understanding and direction of generalisation. CPT takes account of the social and situated nature of teaching where interplay and timing affect outcome. COV is underpinned by the assumption that independent variables have autonomous influence and this cannot be applied to teaching and learning. COV results in theoretical outcomes whereas CPT outcomes are possibilistic related to the configuration of causal mechanisms, much more suited to teaching and learning. CPT emphasises social mechanisms rather than independent variables as is evident in COV approach or explanatory frameworks as is the outcome in the CON approach.

Table 3.1 Three Explanatory Approaches in Case Study Research (Blatter & Haverland, 2014)

Types of Explanatory Case Study	**Co-Variational Analysis (COV)**	**Causal Process Tracing (CPT)**	**Congruence Tracing (CON)**
Research questions and goals	Does variable X make a difference? Testing whether different value X leads to different outcomes.	What makes the outcome possible? Revealing temporal interplay among conditions or mechanisms that lead to specific outcomes.	Which explanatory approach offers more / new insights by comparing the descriptive and explanatory merits of different theories.
Focus	Independent Variables as factors that have an autonomous influence.	Causal Configuration as sequential and situational combinations of causal conditions or social mechanisms.	Theories understood as comprehensive interpretative and explanatory frameworks that complement each other.
Selection of Cases	Select multiple cases according to strong differences in respect of the variable of interest.	Select one or more cases according to accessibility and the practical or theoretical relevance of the outcome.	Select multiple theories according to their place in the scientific discourse and the researcher's theoretical aspirations.
Data Generation	Observations: Information corresponding to the indicators specified for the variables.	Observations: Information on the temporal unfolding of the causal process. Information on spatial-temporal distance and proximity between causes and consequences. Information on perceptions and motivations of important actors.	N/A
Data Analysis	Necessary Content of Data: Co-variation among scores of the dependent variable (Y) and scores of the independent variable of interest (X). Conclusion: X has a causal effect on Y.	Necessary Content of Data: Causal chains and conjunctions. Confessions. Conclusions: The causal configuration consisting of the conditions A, B and C is sufficient for outcome Y.	Necessary Content of Data: A full set of confirmations and contradictions for each theory. Conclusion: Relative importance or specific role of selected theories in explaining the case.
Generalisation	Statistical Generalisation: Drawing conclusions about the causal effect of X on Y from the selected cases and generalising to a population of cases that are similar in respect to all control variables.	Possibilistic Generalisation: Drawing conclusions from the identified causal configuration and mechanisms to the set of potential configurations and mechanisms and / or to the set of proven causal configurations and mechanisms.	Theoretical Generalisation: Drawing conclusions from the explanatory power of theories in 'crucial' cases to the relevance of theories.

This study focussed upon explaining "how" and "why" pedagogical processes support teacher learning in an asynchronous online professional development activity. The study aimed "to reveal the temporal interplay among conditions or mechanisms that lead to specific outcomes" (Blatter & Haverland, 2014, p. 26). The CPT approach to the explanatory case study is suited to research questions that focus upon asking what makes an outcome possible. Blatter & Haverland (2014), also state that CPT is particularly suited to the search for the necessary and sufficient conditions that lead to a specific outcome. In this study, the outcome is teacher learning in assessment in literacy in the classroom that resulted in improved classroom practice in assessment. In addition, Blatter & Haverland (2014), argue that CPT is suited to questions such as "Which combination of conditions make an outcome possible" or "Which underlying mechanisms effectively make the cause creating outcome?" It is noteworthy that Blatter & Haverland (2014), describe the result of a CPT study as "a full-fledged recipe" for making an outcome possible. It can be argued that the CPT explanatory case study approach will provide a valuable contribution to teacher educators' practice and policy planning in the area of assessment education for serving teachers.

Systematic Literature Review

The literature review in a research study "sets out what the key issues are in the field to be explored, why they are key issues and identifies gaps that need to be plugged in the field" (Cohen et al., 2011). Several areas were addressed in the literature review. The first topic was that of classroom assessment. The literature review synthesises several sources of material into an ongoing argument that concluded with what needed to be researched. Database searches were conducted through Dublin City University library to retrieve articles related to assessment. The following search terms were used: 'assessment', 'formative assessment', 'assessment for learning' (AfL), 'assessment policy', 'assessment capacity', 'assessment literacy' 'assessment capability', 'assessment pedagogy', 'professional

development in assessment' and 'assessment education'. In addition, the reference list of each

article was reviewed to find further articles, books, and conference presentations. The articles

were uploaded to Nvivo and the main findings were noted alongside the type of study and the

date. Any 'research gaps', lack of clarity or failure to address topics was noted. A similar

approach was used in the areas of professional development, teacher learning and

asynchronous online learning. Table 3.6 provides an overview of the search terms used.

Table 3.6 Search Terms used During Literature Review

Area	Search Terms
Professional Development	'teacher professional development' 'continuous professional development' 'CPD' 'professional education' 'in-service education'
Teacher Learning	'teacher learning' 'teacher knowledge' 'teacher education' 'teacher agency' 'teacher beliefs' 'teacher identity' 'teacher education pedagogy' 'pedagogy of teacher education'
Online learning	'asynchronous learning' 'online professional development' 'online pedagogy' 'technology affordance'

3.10 Sampling

Purposive sampling is a key part of qualitative research (Cohen, Mannion &

Morrison). The CPT case study approach is characterised by the accessibility of the

participants. In this case, a non-probability, purposive sample was used, as a group of in-

service teachers availing of a five-module asynchronous online course in classroom

assessment was required. A random sample of teachers is of little benefit as they may be

unable to comment on matters of interest to the researcher (Cohen, Mannion & Morrison,

2011). A further advantage of non-probability purposive sampling is the possibility of

maximum variation sampling within a purposive cohort (Teddlie & Tashakkori, 2009). This

allowed the researcher to achieve representativeness by including participants that had a wide

range of characteristics e.g. varied ITE experience in assessment learning, varied teaching

experience and varied teaching context. Table 3.7 offers a summary of the key characteristics of the study sample.

Table 3.7 Composition of Participant Cohorts

Cohort 1(n=35) 39 students; 35 consented to take part	Cohort 2 (n=12) 12 students; 12 consented to take part	Cohort 3 (n=0)
Serving teachers demonstrating twenty hours of meaningful engagement and completing online tasks. Three days of EPV granted by the DES in return for facilitator-researcher evaluation of contributions	Serving teachers undertaking a module in classroom assessment as part of the MTP. Three days of EPV granted by DES in return for facilitator-researcher evaluation of contributions. Five-thousand-word assignment.	Module from the Diploma in Education (Classroom Assessment) Serving teachers undertaking a module in classroom assessment as part of the Diploma in Education. Three days of EPV granted by DES in return for facilitator-researcher evaluation of contributions. Five-thousand-word assignment.

One cohort consisted of serving teachers engaged in a five-module online course in classroom assessment. This cohort completed the asynchronous online tasks which were evaluated by the course facilitator-researcher. Once the "meaningful engagement" (DES, 2017) of the participant had been established by the facilitator-researcher, a course certificate was issued. Where the facilitator-researcher was unable to establish meaningful engagement, follow up emails requested extra contributions or clarification of content. The timing of the coursed corresponded to the traditional demand for "Summer Courses" which grant primary teachers three days of extra personal vacation (EPV) during the following academic year provided the course is completed to the satisfaction of the course facilitator-researcher. The second cohort comprised of students on the Masters in Teaching Programme (MTP) undertaking a module in classroom assessment. Alongside the online contributions, students from the MTP cohort were required to complete a five-thousand-word assignment focussing on the use of assessment and the teaching of literacy. This cohort was also eligible for EPV. In addition, the course was offered in part fulfilment of the award of Certificate and Diploma in Classroom Assessment run by the HEI. However, there were no students in this category during this iteration of the course.

3.11 Data Collection Instruments

The following data collection approaches were used to reflect the phenomenological philosophical position adopted in this study.

Table 3.8 Data Collection Instruments

Data Collection Instruments	
Questionnaires	• The first questionnaire (Appendix A1) was administered at the beginning of Module 1. The questionnaire collected participant demographic data and data indicating participant levels of use of assessment practices in the classroom. Forty-seven participants completed this. • The second questionnaire (Appendix C) administered after Module 5 collected data about teacher learning. Questionnaire 1 and questionnaire 2 were mandatory for course completion purposes. Forty-seven participants completed this. • Questionnaire 3 (Appendix D) was administered when participants returned to the classroom. It collected data on classroom practices following professional development. The questionnaire was not mandatory and did not form part of course requirement for participants as it was in addition to the twenty-hour obligation. Ten participants completed this.
Online Forum Posts	Each of the five modules required a forum post. Forty-seven participants completed this.
Reflective Coursework	Each of the five modules required a reflective journal entry. Forty-seven participants completed this.
Tasks that Plan for Future Practice in Assessment	Each of the five modules contained a task that required participants to plan for future practice in the classroom. Forty-seven participants completed this.
Facilitator-researcher Fieldnotes	The facilitator-researcher made field notes throughout the professional development activity.
External Inspection Report	The professional activity was run as per Summer Course provider guidelines and was inspected externally by a Department of Education and Skills inspector. A written report was provided.

Data sources were authentic learning tasks combined with facilitator-researcher fieldnotes and external inspection reports. Table 3.9 provides an overview of the data sources

and the tracking codes used to ensure trustworthiness and reliability during the causal process tracing.

Table 3.9 Sources of Data in this Study

Tracking Code	Data Source
Participant Cohorts	
MT	Master of Teaching Participant 1-12
SC	Summer Course Participant 1-37
Reflective Questionnaires	
RQ1	Reflective Questionnaire 1 administered at the beginning of Module 1 (Task1a)
RQ 2	Reflective Questionnaire 2 administered at the end of Module 5 (Task 5d)
RQ 3	Reflective Questionnaire 3 administered on return to the classroom (Voluntary)
LR	Completed at the end of Module 5 (DES Requirement)
External Sources	
IR	External Inspection Report
FN	Researcher Fieldnotes
Reflective Coursework	
RC1c	Assessment Journal
RC2a	Response to Professional Reading
RC2b	Formative Assessment Strategies
RC2c	Assessment Journal
RC3c	Assessment Journal (Writing)
RC3b	Forum on Assessment of Writing
RC5b	Forum on Assessment of Reading
RC5c	Assessment Journal (Reading)
RC4b	Forum on Assessment of Oral Language
RC4c	Assessment Journal (Oral Language)
Learning Tasks	
LT2d	Self-Assessment Quiz
LT1b	Response to Assessment Guidelines and Podcast
Planning for Future Classroom Teaching	
P3a	Planning for the Assessment of Writing in the Classroom
P4a	Planning for the Assessment of Oral Language in the Classroom
P5a	Planning for the Assessment of Reading

3.11.1 Three Reflective Questionnaires

Three reflective questionnaires were used to collect data. Prior to completion, and as part of the registration process, participants were asked to provide informed consent.

Participants were asked to complete a reflective questionnaire (Appendix A1) as part of Module 1. Participants completed a second reflective questionnaire (Appendix B) as part of Module 5 of the asynchronous online professional development in assessment. The third questionnaire (Appendix D) was completed by participants on return to the classroom, following the completion of the asynchronous professional development activity. The first two questionnaires were mandatory for course completion purposes. The third questionnaire was optional as it did not form part of the required participant engagement. This questionnaire was included as the literature on teacher learning indicated the importance of follow up in the classroom environment.

Although the reflective questionnaires were a source of research data, they were also a pedagogic tool which allowed participants to reflect upon assessment practice. The first reflective questionnaire collected data about the participant demographics, current practice in assessment, knowledge of assessment and sources of learning about assessment to date. Two principal sources were drawn upon to develop the data collection instrument. The first source was the audit instrument (Lysaght & O'Leary, 2013) developed in an Irish context to evaluate the extent to which serving teachers use key AfL strategies. This instrument was proven to be reliable and valid with an alpha reliability of between 0.83 and 0.92. The second source was the work of De Luca et al. (2013), which studied the pedagogies that supported pre-service teachers' learning in assessment. The survey used in this study focused upon the four key areas of assessment practice in the classroom namely, sharing learning intentions and success criteria, questioning/discussion, feedback and peer- and self-assessment. Participants responded to statements describing how each strategy is implemented in the classroom. Participants were asked to choose the response that most accurately reflected their current AfL practices. The categories provided included Embedded or used 100% of the time;

Established or used 75% of the time; Emerging used 50% of the time; Sporadic used 25% of the time or Never which equated to 0% usage. Participants were also asked about their learning to date in assessment and what approaches best facilitate their learning as teachers. The survey also contained a number of open ended questions about teacher perception, motivation and confidence about using formative assessment. The survey was piloted by serving primary teachers who did not form part of the participant cohort for this study. The second questionnaire contained items relating to participant learning and participant responses to the professional development activity. The third questionnaire asked participants to reflect upon their learning and change of practice if any on return to the classroom. Once again each of these questionnaires was piloted on serving teachers who did not form part of the study cohort.

3.11.2 Online Forum Posts

The advantage of collecting data from online discussion posts is that interaction can be observed but the researcher must account for chronology (Cohen et al., 2011). Participants were required to make posts during each module. A reflective prompt was provided by the facilitator-researcher. Posts included responses to course material and discussions about teaching and assessment contexts. The data were collected electronically by task and transferred to Nvivo for analysis. The posts were uploaded to Nvivo by discussion topic and by participant as it was necessary to have an overview of each participant's learning and contributions. As discussed in the introduction (Table 1.1), affordances and constraints of technologies were considered before selection.

3.11.3 Reflective Coursework

Reflective journals feature prominently in adult and professional education. In addition, reflective writing is an established component of data collection in qualitative

research. In this study, reflective coursework in the form of pre-course readings with reflective prompts, online discussions and postings were used as both a pedagogical approach and a data collection instrument. However, the quality of the reflective material may affect the construct validity of the research as Cowan (2014), argues that the process and purpose of reflective writing may not clearly understood or articulated. Moon (1999), has stated that for many reflective writing as a mysterious activity and unless the writer is allowed to develop a concept of reflective writing the process is meaningless.

Yin (2014), argues that the most important use of documentary data is to corroborate data from other sources. If the reflective writing is to complement the open-ended questionnaire and focus group data the perceptions, motivations, context and processes must feature in the reflective material. A strength of reflective writing is that it is a document; therefore, it can be specific and can contain exact details of an event. It is also stable and can be reviewed repeatedly (Yin, 2014). However, it can be argued that reflective writing, like interviews is very dependent on the questions prompting the participant (Cowan, 2014). Reflective contributions by students suit this study as the researcher has used the reflective writing as a component of coursework for the entire student cohort. Questions (Appendix E) that aim to corroborate data from the questionnaires were used along with current best practice in reflective writing.

Participants completed five reflective contributions as part of their course assignments. Each contribution is made at the end of the modules. The final contribution is a reflection on the overall course learning. Students from the M Ed cohort completed a reflective assignment based upon six professional reading in assessment. Prompts were provided by the facilitator-researcher. In addition, follow up reflective data were collected

when participants returned to their teaching contexts. Moon (1999), argues that it is not sufficient to ask students to make reflective contributions without guidance. Guidance was given in the form of prompts (Appendix E). The reflective writing prompts were piloted on serving teachers who had already completed a classroom assessment course but did not form part of the study cohort.

3.11.4 Tasks that Plan for Future Practice in Assessment

Course participants were required to submit plans for future teaching and assessment activities in the classroom using the Primary Language Curriculum (DES, 2014), PDST manuals on the teaching of oral language (PDST, 2014a), reading (PDST, 2014b) and writing (PDST,2014c), Drumcondra Profiles (Murphy & Shiel, 2000), professional readings and strategies modelled by video clip followed by reflection.

3.11.5 Facilitator-researcher Fieldnotes

Observation offers an opportunity to observe a phenomenon in a real-world setting (Yin, 2012). Observations and reflection were noted the researcher fieldnotes (Appendix F) However, participant observation allows the observer to assume a variety of roles and actually participate in the actions being studied. In this study, the researcher was also the course facilitator-researcher.

3.11.6 External Inspection Report

As part of the course provider accountability procedures, an external inspection was carried out by a member of the Department of Education and Skills (DES) inspectorate. A written report (Appendix M) was furnished to the course provider. The inspector had access to all participant contributions, facilitator-researcher contributions and course material. Even though CPT does not set out to evaluate a phenomenon, but rather offer causal explanations,

this document offered insight from an outsider perspective into the context of the teacher

learning during a professional development activity.

3.12 Data Analysis

The data gathered from this study were qualitative and quantitative. The data were

gathered from the course contributions that formed part of the normal interactions in an

online professional development activity. The research questions ask how teacher learning

takes place during an asynchronous professional development activity. When questions ask

how or why something happens in a particular context where variables are difficult to control

and measure a qualitative study is best suited (Trainor & Graue, 2014). The qualitative data

were generated from reflective course work, planning tasks, reflective questionnaires,

researcher fieldnotes and external inspection reports. The quantitative data were collected on

the first and second reflective questionnaires. The quantitative data were ordinal in nature

consisting of responses to Likert type items asking participants to indicate the level of usage

in the classroom of assessment strategies. Items from this survey, had been developed by

Lysaght & O'Leary (2013), as part of an audit instrument for classroom teachers. As the

instrument was also used as a pedagogy by the researcher, the focus was on establishing

levels prior teacher learning and practices in assessment, teaching experience and teaching

context. However, the data collected were used to profile the participant cohort using

descriptive statistics. These data were analysed using Excel to identify frequencies and

generate graphs indicating which strategies had been Embedded[20] in classroom practice,

which were Established, which were Emerging which were used Sporadically and which

were Never used by the participants. Links were made between the quantitative findings and

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[20] Embedded used 100% of the time, Established used 75% of the time, Emerging used 50% of the time,
Sporadic used 25% of the time and Never used 0% of the time.

qualitative data for triangulation purposes. Table 3.10 provides an overview of the

quantitative and qualitative data sources that were used for triangulation.

Table 3.10 Data Sources used for Triangulation Purposes

Quantitative Data	Qualitative Data
Answers from the Reflective Questionnaire 1 Likert statements prompting participants to reflect upon their classroom practice.	Answers from the Reflective Questionnaire 2 which contained open ended questions reflecting on strengths and weaknesses of classroom practice in assessment
	Open ended answers from the DES reflective task.
	Open ended answers from Reflective Questionnaire 3 when participants returned to the classroom.
	Facilitator field notes.

It is important to note that Yin (2009), when identifying the characteristics of rigorous

explanatory case study research, states that following analysis, evidence should be

distinguished from researcher's interpretation (Table 3.3). This is perhaps what differentiates

an explanatory case study from an experimental inquiry and the narrative reporting in

traditional case study. Cohen et al. (2011) however, point out that there is no one correct way

to analyse and present qualitative data but that the researcher must take account of the issue

of fitness for purpose of the analysis and presentation of findings. In this study, it was

necessary to use both inductive and deductive reasoning in order to identify learning from

previously developed frameworks in conjunction with allowing for emergent themes.

Yin (2012), notes that a type of pattern matching called explanation building, also

referred to as process tracing, is suited to explanatory case study data analysis. To "explain"

a phenomenon, in this case teacher learning in assessment, is to "stipulate a presumed set of

causal links about it, or how or why some thing happened. The causal links may be complex

and difficult to measure inn in any precise manner" (Yin, 2014, p. 147). Stronger case

studies, Yin (2014), argues, tend to reflect existing theoretical propositions. In this study, theoretical propositions relating to assessment learning, teacher learning, and online learning informed the data analysis. The data were analysed using a framework (Fig 3.3) informed by literature on pedagogy in professional development and teacher learning.

Professional Development Pedagogy Processes

Processes that engage participants in learning; Activities constructed to promote learning (Timperley, 2007)

1. Cognitive Presence (Garrison, Anderson & Archer, 2000)
2. Modelling;
3. Reflection;
4. Research Based Course Material;
5. Exploring Assumptions, Korthagen (2010) Loughran (2007)

Explanatory Case Study & Causal Process Tracing

Analytical Framework

Impact of Professional Development

Develop Teacher Knowledge Shulman (1986)

Develop Teacher Knowledge Base for Assessment (Xu & Browne, 2016)

Shift in Beliefs and Practice (Cochran-Smith & Zeichner, 2005; Tan & Nashon, 2013)

Level of Concern Hall & Hord (2006

Desired Outcomes (Harland & Kinder, 2015)

Identity, Agency, Community of Practice (Lave, 2008)

Complexity Theory (Opfer & Pedder, 2011); Critical Realism (Bhaskar, 1978; 1997)

Figure 3.3 Analytical Framework used to analyse evidence of teacher learning, to identify processes that result in learning.

To answer the question about pedagogies reference is made to the definition developed by Timperley et al. (2007), in their best evidence synthesis iteration review of professional learning in New Zealand where pedagogy is defined as the activities constructed to promote professional learning which result in a specific set of processes. Loughran's (2007), work

identifying a pedagogy for teacher educators also influenced the framework together with Korthagen's (2010), model of ITE. Identification and analysis of instances of professional learning was informed by theories relating to teacher learning and online learning. In particular, teacher learning as knowledge development (Shulman, 1986), teacher learning as a shift in belief, practice or concern (Hall & Hord, 2006), and learning as indicated by cognitive presence in online settings have informed the data analysis. Any analysis of data relating to factors that impact upon teacher learning is based upon the theory of Opfer & Pedder (2011), who state that professional learning takes place in a complex environment made up of interconnected systems of the individual teacher, the school and the teacher professional learning activity. Critical realism (Bhaskar, 1978; 1997), states that causative mechanisms for a phenomenon that is both experienced and observed can be explored. Even though teacher learning as a phenomenon takes place within a complex setting, the actual pedagogies that bring about such learning can be viewed as a causative mechanism.

Bazeley (2013), points out that Hume argued that we cannot prove causation; all we can do is observe a conjunction of events and such observation is a sufficient basis for empirical science. Indeed, Miles & Huberman (1994), consider qualitative analysis to be a powerful method of assessing causality as "with its close-up look, can identify mechanisms" (p.147). As complexity theory and critical realism form part of the conceptual framework for this study it is worth noting that Bazeley (2013), argues that causation in a qualitative study may not be a physical mechanism; beliefs, values and concepts can be seen as integral parts of a context in which a mechanism functions and the context in which the process occurs is critical to the process. Complexity theory as interpreted by Opfer & Pedder (2011), states that teacher learning in influenced by factors from the teacher's personal domain, the immediate school environment and wider societal and policy spheres.

Theoretical thematic analysis was conducted using both deductive and inductive approaches. The deductive analysis was bounded by reference to teacher learning frameworks and a literature review. Deductive or theoretical analysis has six discrete phases (Braun & Clarke, 2006).

Phase 1: Familiarising yourself with your data: Immersion, repeated reading with a view to identifying patterns, making notes, marking ideas for coding. The researcher needed to identify evidence of teacher learning and eliminate causes other than processes or activities during the professional development activity.

Phase 2: Generating initial codes: Codes identify a feature of the data (semantic content or latent) that appears interesting to the researcher, and refer to most basic part or element, of the raw data that can be assessed in a meaningful way about the phenomenon in question.

Phase 3: Searching for themes: All data have been coded and collated; Analysis of codes begin. A thematic map begins to emerge.

Table 3.10 provides some insight into the thinking of the researcher as the data analysis process proceeded. During the data analysis process the researcher was informed by the analytical framework underpinned by research on teacher learning, assessment learning and teacher education. This analysis was conducted using data collected and uploaded to the NVivo and sorted by task and module into folders. Folders were opened for each cohort along with a folder for fieldnotes and facilitator-researcher observations. Some pieces of text were assigned multiple codes.

Phase 4: Reviewing themes: Initial themes may have to be discarded of developed further by sub division into additional themes.

Phase 5: Defining and naming themes: Each theme must have a story but still relate to one another within an overall structure. Appendix O contains the code book generated in Nvivo that informed defining and naming the final themes to structure the final report.

Phase 6: Producing the report: producing convincing analytical narrative to make an argument in relation to the research question.

Table 3.11Data Analysis (Braun & Clarke, 2006)			
Data Sample	**Phase 1** **Immersion, repeated reading making notes and marking ideas for coding**	**Phase 2** **Generating Initial Codes**	**Phase 3 Searching for Themes: A thematic map begins to emerge**
1 & 2. I referred to the "Drumcondra Writing Indicators", "The Primary Language curriculum" and the "Writing Genre- a structured approach" (PDST) in drawing up the success criteria for this specific writing lesson. The PDST book discussed using these headings to create an effective piece of recount writing; who, where, when, feelings. Both points 1 & 2 in the success criteria drawn up below aim to achieve the following outcome " children should be able to use the writing process when creating texts collaboratively and independently." (EPV2B)	Evidence of engagement with course material which will foster an awareness of current best practice Description planned future practice not sure whether there is a change or affirmation of current practice. Evidence of awareness of language of assessment and structures and conventions necessary in the classroom. If used proximal outcome present	Engaging with Content; Influencing Practice; Affirming Practice; Demonstrating Knowledge; Proximal Outcome	The research question asks what are the pedagogies that best support teacher learning and what is the role of online learning. The use or researched based course material leads to raised awareness of current best practice. As a pedagogical approach, it appears to have an impact.
My use of feedback has been shamefully generic in my practice to date. Having reflected upon my feedback practice, the words "good, very good, super, fantastic" etc. spring to mind, with little recollection of any constructive criticism. I have rarely been specific with my praise. Furthermore, I have never afforded an opportunity for any useful feedback to be acted upon, finding myself continuously correcting the same mistakes again and again in my correction of written work. Finally, my feedback has been consistently grade heavy; with pupils only checking their end of test score as opposed to the comment. My current practice must seek to become more informative and specific with my use of feedback. This is something that I must improve for my future teaching practice. (MTQM1)	The affect is stimulated with the participant experiencing cognitive dissonance about current practice. Reflection on practice is evident along with engagement with course material. Knowledge of practice is evident with a recognition of areas of difficulty. Change in beliefs and attitude to classroom personal practice. Teacher agency and personal responsibility to improve and change can be seen	Affect; Cognitive Dissonance; Reflection; Demonstrating Knowledge; Change in Belief; Teacher Agency	Reflection on practice leads to planning for change, awareness of the need to change and awakening the affect all parts of teacher learning Avalos (2011) sees change as professional development
I think this is good work, but it would be better if you coloured inside the lines/completed the task faster etc. In the next activity, I have noticed that the pupils might ask; is my colouring better now? or how much time is left? They are aware of what they need to do to achieve success as a result of my detailed feedback. (FUQ)	Change as this is from the same participant. Awareness of assessment beyond the strategy. Change in belief and attitude. Knowledge of assessment demonstrated. Positive impact upon the process of learning and metacognition of the classroom pupils. Evidence of teacher learning. Attributable to the professional learning activity as the change came about following the course and reflective.	Change; Impact upon Student; Impact Upon Learning Process; Teacher Learning from this Course.	Change as professional development Change in practice in the way the teacher relates to the students and how the students have changed in the way they think about their learning.

3.13 Ethical Issues

Since the research is being conducted by the researcher as part of a course requirement there is a risk that the researcher may be motivated by self-interest and bias may be evident. Cohen et al. (2011), state that feelings of anxiety and powerlessness in the participants can interfere with obtaining valid informed consent. Informed consent is the basis of ethical research (Howe & Moses, 1999). In addition, coercion, or the perception of coercion to participate or continue with the research is a questionable practice (Robson, 1993). All participants were reassured that there was no coercion to participate and participation in the study was voluntary. Participants were also informed that all data collected formed part of coursework. Coursework however, did not include the follow-up questionnaire, which did not form part of course completion requirements. A plain language statement and consent form were provided to all participants (Appendix A). The MTP cohort were provided with a hard copy during the initial face-to-face session and the EPV cohort were provided with a digital copy before the first module. Cohen et al. (2011), state that seeking formal informed consent may lead to a narrow range of data and a reduction in authenticity as participants may become more guarded in what they disclose. However, in this study disclosure and raising awareness of teaching context forms part of the learning process as teachers become aware of the contextual factors that influence their own learning and practice in assessment. The facilitator-researcher scaffolded discussions for the purpose of teacher learning in an authentic teaching setting rather than to promote disclosure for data collection. To adhere to ethical guidelines in an online setting all participants were enabled to correspond with the facilitator-researcher or course administrator in private via email should they wish to withdraw from the study at any point. Participants were assured verbally and in writing that the data collected would be kept confidential, stored securely and would only be used for the purpose of the study to develop a greater understanding of teacher learning.

Assuming multiple roles during data collection can present challenges. Even though there are distinct advantages in relation to access and the opportunity to observe the reality from the inside standpoint, there is a challenge in relation to bias. Yin (2012), highlights the threat to credibility if certain challenges relating to participant observation are not acknowledged. The threats relevant to this study may include the time available to carry out observation alongside participatory duties and the difficulty in remaining neutral towards the group being studied. Cohen et al. (2011), argue that most educational research involves sensitivities and by extension, it can be argued, that bias is inherent.

The power differential between facilitator-researcher and participant along with the motivation of the researcher could contribute to a threat to credibility of the findings. Because the research is being conducted as part of a course requirement and there is a risk that the researcher may be motivated by self-interest and result in bias. Cohen et al. (2011), state that feelings of anxiety and powerlessness in the participant can interfere with obtaining valid informed consent. Informed consent is the basis of ethical research (Howe & Moses, 1999). In addition, coercion, or the perception of coercion to participate or continue with the research is a questionable practice (Robson, 1993).

3.14 Validity and Reliability Audit Trail

The qualitative nature of this study is evident in the fact that it that seeks to understand a phenomenon, namely that of teacher learning, in a specific context namely the asynchronous online professional development activity. The researcher does not manipulate the phenomenon under investigation but allows the phenomenon to emerge from an authentic setting (Patton, 2001). In a qualitative study validity is defined as the honesty, depth, richness and scope of the data achieved, the participants approached, the extent of triangulation and the objectivity of the researcher (Cohen et al., 2007). The authors also maintain that absolute validity is impossible, but the researcher should strive to ensure maximum validity. Indeed,

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Le Compte & Preissle (1993), state that validity in qualitative work can be ensured by confidence in the data, the ability of the researcher to report the participant perspective authentically, the cogency of the data, the soundness of the research design, the auditability of the data and the confirmability of the data. Cohen et al., (2007), also raise the issue of the researcher effect and state that the observer needs to become part of the context.

In his discussion of reliability in qualitative research, Golafshani (2003), identifies the examination of the trustworthiness of the process, as the key approach to ensuring reliability in qualitative research. There are suggestions that the term reliability should only apply to quantitative research where the assumption of possibility of replication exists (Cohen et al., 2007). However, Le Compte & Preissle (1993), argue that although qualitative studies seek to distinguish themselves from quantitative work by their unique treatment of a subject, the researcher should still strive for replication in order to ensure reliability. They state replication can take place by repeating the status of the researcher, the choice of participants, the social conditions, the analytical constructs used and the methods of data collection and analysis. Cohen et al. (2007), also highlight the eclectic use of data collection instruments to ensure reliability in qualitative research. Table 3.12 outlines the steps taken during the study to ensure reliability and validity. These steps were informed by Cohen et al. (2007) and LeCompte & Preissle (1993).

Table 3.12 Steps taken to Ensure Validity and Reliability in this Study

Validity (Cohen, et al., 2007; LeCompte & Preissle, 1993)	Reliability (Cohen et al., 2007)
Honesty: Participant contributions were made in the authentic context of interactions in an asynchronous online setting	Replication: Description of researcher, participants, conditions, constructs used, data collection and analysis.
Depth: Data was collected from contributions during and after learning.	Eclectic use of Instruments: Variety of sources
Richness: Sources included forum contributions, planning for the classroom, reflective assignments, surveys, facilitator-	Triangulation: Questions posed in several instruments, data sources compared.

researcher field notes and external inspection reports	
Scope: The entire professional development activity was included	
Participants: Serving Teachers experiencing asynchronous online professional development in an authentic setting.	
Research Design: Clearly recorded research design influenced by the phenomenon and extant literature on teacher learning	
Auditability: Clearly marked audit trail for all data	

3.15 Conclusion

Investigating teacher learning as it happens is different to researching teacher learning as a historical phenomenon. In order to identify triggers or causal mechanisms that bring about teacher learning, the explanatory case study method rather than an exploratory or descriptive case study method is most suited. In particular, the causal process tracing category of explanatory case study is of use, as it purports to trace the learning in a situated context rather than as an 'after-the-fact' event. Given the situated nature of teacher learning, the data collection instruments used contained the actual course contributions of participants during the asynchronous online professional development activity. Such contributions document the thinking and beliefs of the participant with regard to classroom assessment and can therefore be used to identify instances where teacher learning has either occurred or perhaps not occurred.

The contributions however, must form part of a planned task structure with a clear rationale as discussed in Chapter One (p.13). Otherwise, the data collection process is difficult to replicate and compromises the reliability and validity of the research outcome. The data collection instruments have been selected with reference to the affordances and constraints of the technology available. The data analysis used both inductive and deductive approaches as the facilitator / researcher needed to refer to existing frameworks to identify

instances and depth of participant learning from the online contributions. In addition, the facilitator / researcher identified emerging themes as the data set was analysed. Given the nature and quantity of the data a clear audit trail was established. Once again clear procedures added to the replicable quality of the research study.

The methodology was also informed by the theoretical frameworks of complexity theory and critical realism. These frameworks help conceptualise teacher learning by outlining key features of the environment in which teacher learning takes place. Given the complex and variable nature of in-service learning during professional development, the frameworks inform the data analysis process as to the levels and interlocking systems that impact upon teacher learning. The levels and interlocking systems in which teachers operate as learners are conceptualised by complexity theory and critical realism. Such frameworks also help to situate the pedagogies used during professional development and explicate the tensions that exist in the landscape of teacher learning at in-service level.

Chapter 4 - Findings

4. 1 Introduction

This chapter sets out the findings from the study with a view to identifying the generative mechanisms or pedagogical processes that bring about learning during interactive asynchronous online[21] professional development. The impact of the interactive asynchronous online environment (Means et al., 2010), on teacher learning is also considered. The findings begin with a description of the case under investigation, and participant profiles.. The findings are presented in the main themes following the learning journey of course participants in the interactive asynchronous learning setting during professional development. Throughout the journey the key processes that trigger teacher learning are identified, together with significant factors that influence teacher learning in assessment.

The findings of this study are presented with a view to answering the following research questions:

1. What are the pedagogical approaches that best support teacher learning in assessment, during interactive asynchronous online professional development in classroom assessment in literacy?

2. What is the impact of the interactive asynchronous learning environment on teacher learning?

In keeping with the explanatory case study approach (Yin, 1999), the findings will be used to describe and explain the learning of participants during the five-module online professional development activity.

It is noteworthy that Cochran-Smith et al. (2014) commented that the use of critical realism in addition to complexity theory helped the educational researcher move beyond

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[21] Interactive asynchronous online professional development is defined by Means et al. (2010) as an online activity with a time lag between the presentation of instructional stimuli and student responses with interaction between students, between facilitator and students and between students and course content.

using the data "to tell the story of what happened". Critical realism, they argue helps the researcher identify explanations and in turn use the explanations to drive practice. Critical realism (Bhaskar, 1978, 1997) identifies three levels of reality in which a phenomenon exists: the empirical level, the real level and the actual level. Table 4.1 offers an outline of the characteristics of each of the three levels of critical realism and how they in turn level relate to teacher learning during professional development. Each level of critical realism has been used to inform the findings of this study.

Table 4.1 Levels of Critical Realism (Bhaskar, 1978; 1997)

Level	Description	Examples from this Study
Empirical Level	Experienced and Observed Event	Teacher learning in the form of changed knowledge, practice and beliefs; No change in practice or belief; Evidence of failure to learn
Actual Level	Event Occurs whether observed or not	Teacher reading, viewing asynchronous facilitator-researcher presentations, viewing video clips, listening to podcast, teacher thinking, composing responses
Real Level	Causal Mechanisms within Structures that cause events to occur at Empirical Level	Underlying Mechanisms that explain teacher learning in Assessment: Pedagogical processes such as reflective course work, planning for teaching, online discussion posts

The findings commence with a description of the case under investigation. This section is then followed by analysis of the key findings. The findings are set out in themes that reflect the learning journey of participants. The findings also reflect the focus of the research questions. The areas for consideration include beginning the learning by establishing participant profiles. The next area for consideration is the progression of the learning journey using assessment as pedagogy, modelling, research based course materials as generators of learning and writing as pedagogy. Following on from progressing the learning, deepening the learning is discussed with a focus on the use of reflective coursework. The asynchronous setting, the agentic response to professional development and a typical learning journey are also examined. Finally, the role of complexity theory and critical realism is considered.

The data sources and the corresponding codes used in the following section are summarised in Table 4.2. The sources include reflective questionnaires, planning tasks,

responses to professional readings and podcasts, assessment journal contributions, emails and

forum contributions. Researcher field notes and external inspection data are also used.

Table 4.2 Data Source Codes for Asynchronous Online Professional Development

Code	Source
Participant Cohorts	
MT	Master of Teaching (Participant 1-12)
SC	Summer Course (Participant 1-37)
Reflective Questionnaires	
RQ1	Reflective Questionnaire 1 administered at the beginning of Module 1 (Task1a)
RQ 2	Reflective Questionnaire 2 administered at the end of Module 5 (Task 5d)
RQ 3	Reflective Questionnaire 3 administered on return to the classroom (Voluntary)
LR	Completed at the end of Module 5 (DES Requirement)
External Sources	
IR	External Inspection Report
FN	Researcher Fieldnotes
Reflective Coursework	
RC1c	Assessment Journal
RC2a	Response to Professional Reading
RC2b	Formative Assessment Strategies
RC2c	Assessment Journal
RC3c	Assessment Journal (Writing)
RC3b	Forum on Assessment of Writing
RC5b	Forum on Assessment of Reading
RC5c	Assessment Journal (Reading)
RC4b	Forum on Assessment of Oral Language
RC4c	Assessment Journal (Oral Language)
Tasks	
T2d	Self-Assessment Quiz
T1b	Response to Assessment Guidelines and Podcast
Planning for Future Classroom Teaching	
P3a	Planning for the Assessment of Writing in the Classroom
P4a	Planning for the Assessment of Oral Language in the Classroom
P5a	Planning for the Assessment of Reading

4.2 Case Description

The case under investigation in this study is an asynchronous online professional

development activity in the use of formative assessment strategies in oral language, reading

and writing. Yin (1999), states that quality research in explanatory case studies requires a

clear definition of the case, and principles connected with the case. In this case, the

professional development activity was broken into five modules (Appendix G), and ran from 4th July to 18th August 2016, with interactive asynchronous learning, using an online platform provided by the HEI. A total of forty-seven participants took part in the professional development activity; forty-two participants were female (89%) and five participants (11%) were male. The total consisted of two separate groups. One group consisted of students from the Master of Teaching Programme (MTP). The second group was the Summer Course (SC) cohort. Each cohort completed the professional development activity using similar course material and tasks on separate digital platform pages provided by the HEI.

The MTP cohort (n=12) had been formed the previous year and this professional development activity was deemed to be module five of their overall two-year programme. Completion of this module was in part fulfilment of the academic award of Master of Teaching and included a one-day, face-to-face session prior to the asynchronous online portion. The SC cohort (n=35) was formed from serving teachers who had elected to complete a twenty-hour asynchronous online professional development activity during the months of July and August. Thirty-seven of the thirty-nine participants who registered, agreed to take part in the research. The pie-chart in Fig. 4.1 shows the breakdown of the overall number of participants.

PARTICIPANTS

MTP, 12, 26%

SC, 35, 74%
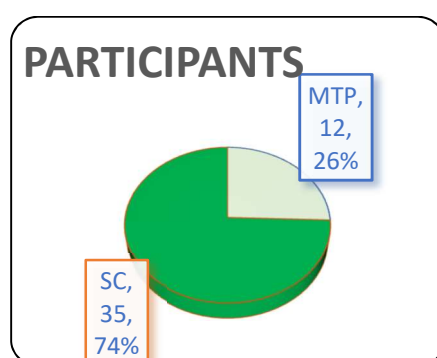
Figure 4.1 Study Participants

In an Irish context, this type of professional development is often referred to as a "summer course" and is a well-established elective form of professional development for

serving primary school teachers. Eighteen thousand primary school teachers undertake this type of PD activity every year, ten thousand of whom complete the PD online. Of the ten thousand that complete asynchronous online PD, many teachers undertake three such courses. Serving teachers who complete this type of professional development to a satisfactory level, as determined by the facilitator-researcher, are awarded three days of extra personal vacation (EPV). Both cohorts in this study were eligible for EPV.

The DES required participants in the SC cohort to demonstrate twenty hours of meaningful engagement, of which a minimum must be ten hours' online engagement. The other ten hours of independent learning, took place offline. The MTP cohort participants were required to demonstrate a similar breakdown of the twenty-hour engagement, read and reflect on six professional readings prior to Module 1 and submit an additional five-thousand-word assignment, based on classroom assessment in reading, writing and oral language . Figure 4.2 outlines the sequence of the components of the professional development activity. Components included assessment theory, and the assessment of writing, oral language and writing. Reflection on teacher learning and the application of new learning in the classroom also featured. The model indicates the tasks and interactions undertaken by participants as they progressed through the professional learning structure. In addition, the model identifies the processes that were incorporated as part of the learning trajectory. Compulsory and non-compulsory aspects of the coursework are highlighted in conjunction with the separate requirements for each participant cohort.

Professional Readings and Reflective Assignment.

MTP Group

Processes: Reading; Writing; Reflecting.

Task: Written Responses to Reflective Prompts for each article (Appendix E).

Face-to-face Session - One day.

MTP Group

Processes
Questioning; Discussion; Exploring Assumptions; Modelling; Assessment as Pedagogy.

Tasks: Identify key themes from professional readings.

Module 1 Formative Assessment an Overview: Examining Practice (Online)

MTP and SC Groups

Processes: View asynchronous facilitator presentation; Reflection using Audit Instrument; Listen to Podcast; Respond to Podcast; Assessment Journal; Read Assessment Guidelines.

Tasks: Respond to podcast; identify key ideas from Assessment Guidelines; Assessment Audit Instrument: (**Reflective questionnaire no. 1**); Assessment Journal.

Module 5 Assessment of Reading and Reflection on Learning (Online)

MTP and SC

Processes: Read course material; plan to assess reading; Writing Assessment journal: Reading; Reflection.

Tasks: Plan for the assessement of reading; Forum contribution; Journal Contribution; Refelection on My Learning in Assessment as a Teacher (**Reflective Questionnaire no. 2; DES Learning Record**)

Module 4 Assessment of Oral Language Online

MTP and SC
Processes: View asynchronous facilitator presentation; Reading course material; Watch video clip.

Tasks: Classroom plan to assess oral language; Oral language forum post; Assessment Journal.

Module 3 Assessment of Writing (Online)

MTP and SC Groups

Processes: View asynchronous facilitator presentation.

Professional reading: providing feedback; Watch Video on writing conference; Response to Video; Plan lessons.

Tasks: Plan success criteria for writing; Forum contribution; Assessment Journal.

Module 2 Assessment Theory: Specific Strategies for Formative Assessment (Online)

MTP and SC Groups

Processes: View asynchronous facilitator presentation.

Read professional readings; Reflection on professional readings;writing; self-assessment.

Tasks: Identify assessment strategies; respond to podcast; journal contribution; respond to professional reading; take self-assessment quiz on assessment strategies.

Inspectorate Feedback to Course Facilitator.

Follow-Up Questionnaire (**Reflective Questionnaire No. 3).** MTP and SC (Optional).
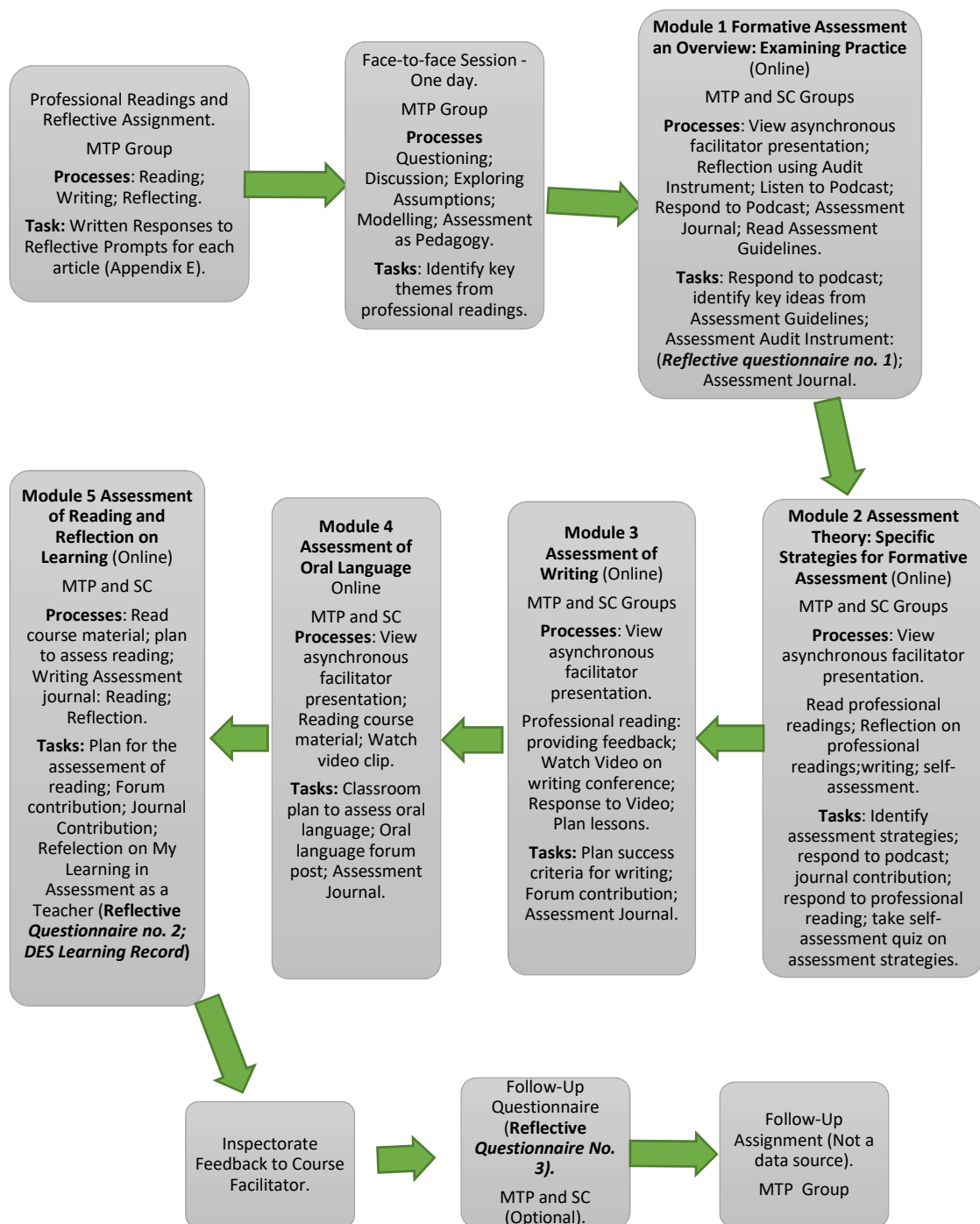
Follow-Up Assignment (Not a data source). MTP Group

Figure 4.2 Model of Learning Journey During Professional Development

Key: MTP = Master of Teaching Programme; SC = Summer Course

4.3 Beginning the Learning: Establishing Participant Profiles

The literature highlighted the variable and non-linear nature of teacher learning and, the variability in learning for in-service teachers. Indeed, many authors have referred to the influence of learner characteristics on teacher learning (McGee & Colby, 2014; Popham, 2004, 2011; De Luca et al., 2013). Data from the first questionnaire (Appendix A1), collected at the start of the learning journey, indicated variations among participants in teaching experience, teaching context, prior learning in assessment and current classroom practice in assessment. The questionnaire contained three sections. Part one, questions one to seven, collected demographic data. Part two, questions eight to sixty-five, was based on the assessment audit instrument developed by Lysaght & O'Leary (2013). Part three contained reflective questions about the participants' current practice in assessment concerning the audit instrument questions. The following section describes the findings and are grouped into broad categories of beginning, progressing and deepening the learning followed by the impact of the interactive asynchronous learning setting. This section looks at the elements of beginning the learning journey such as teaching experience, teaching context, prior learning in assessment and participants' current practice in assessment in the classroom.

4.3.1 Experience

Data provided in question one of Reflective Questionnaire 1 (Appendix A1), indicated the length of teaching experience of participants, varied more among the SC cohort than the MTP cohort. The graph in Fig 4.3 shows the summary of the number of years teaching experience of the course participants. No participant in the MTP cohort had more than ten years of teaching experience, while fifteen participants in the SC cohort had more than ten years of teaching experience. Overall fifteen participants had up to five years' teaching experience, eighteen participants had between six and ten years' experience and fifteen

participants had ten or more years' experience. The influence of participant teaching

experience will be discussed in greater depth at the end of the chapter in section 4.8.
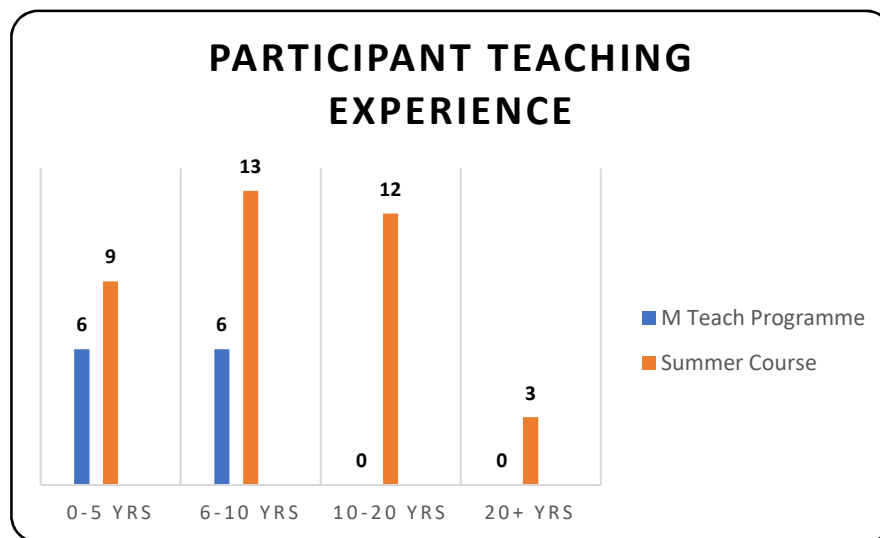
Figure 4.3 Participant Teaching Experience

4.3.2 Teaching Context

Question two asked participants to identify their current teaching role. Participants

indicated a total of seven different teaching contexts. The pie chart in Fig 4.4 displays the

teaching contexts of the MTP participants and Fig. 4.5 shows the teaching contexts of the SC

participants. As can be seen from the pie charts a higher percentage overall of participants

were in mainstream class teaching contexts with 9 MTP participants and twenty eight

participants teaching in mainstream classroom settings.
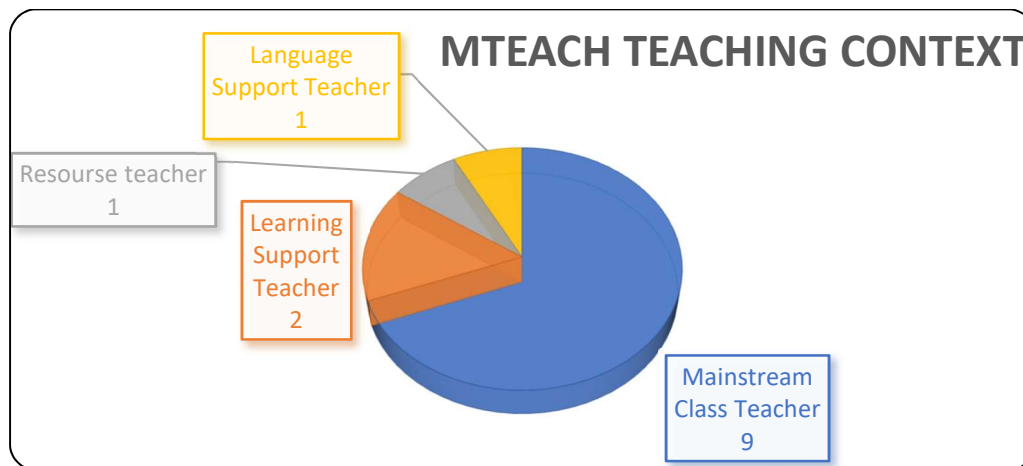
Figure 4.4MTP Teaching Context
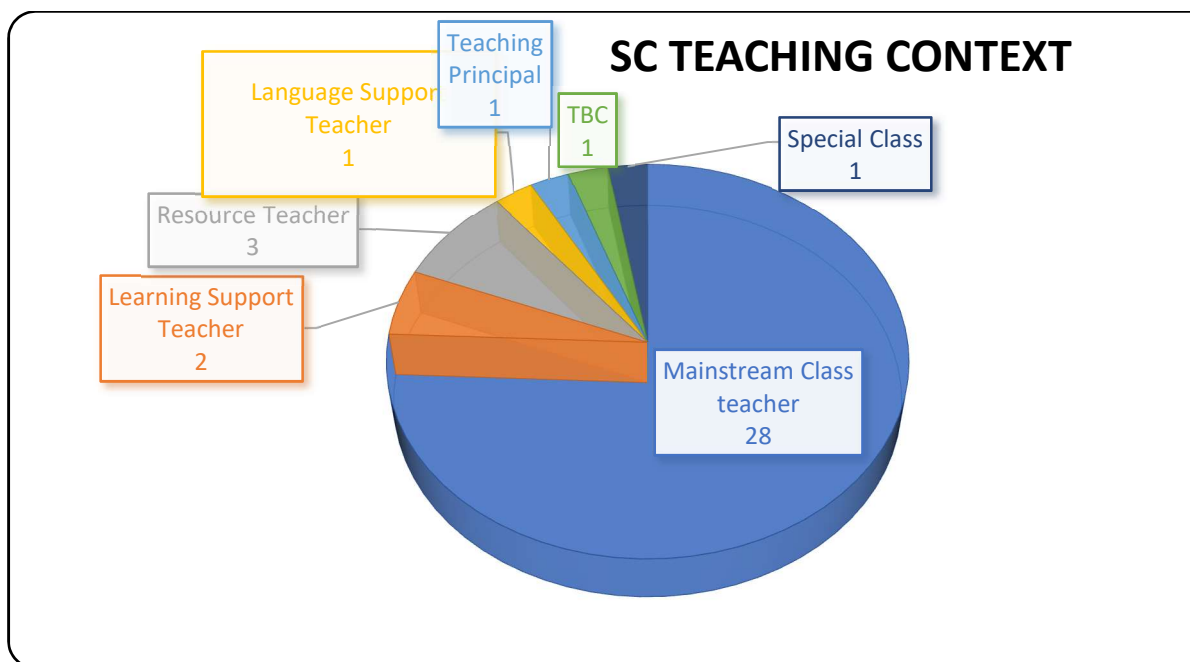
Figure 4.5 SC Teaching Context

4.3.3 Prior Learning in Assessment

Question three and four asked participants their views on preparation they received for carrying out assessment in the classroom during their own ITE. The pie charts in Fig. 4.6 and Fig. 4.7 provide a breakdown of participants' views of their own ITE relating to

assessment education and its role in preparing participants for the everyday reality of classroom practice.
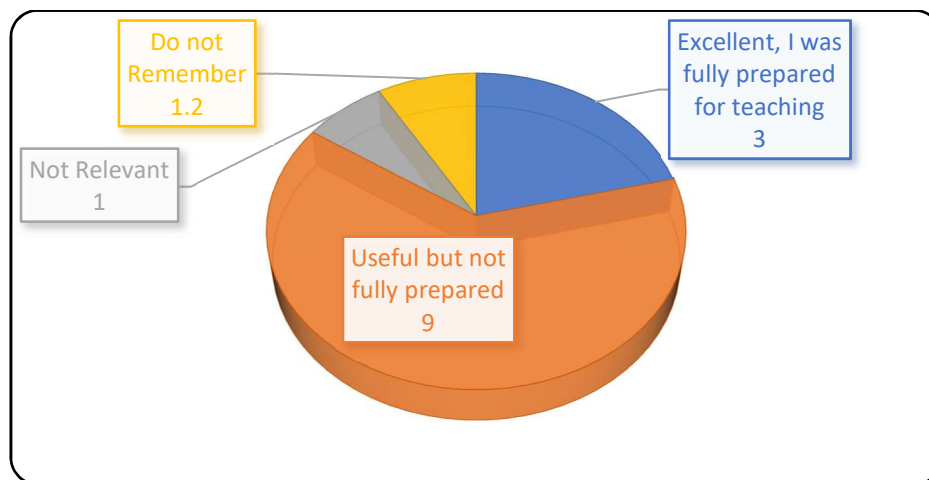
Figure 4.6 ITE in Assessment MTP Participants
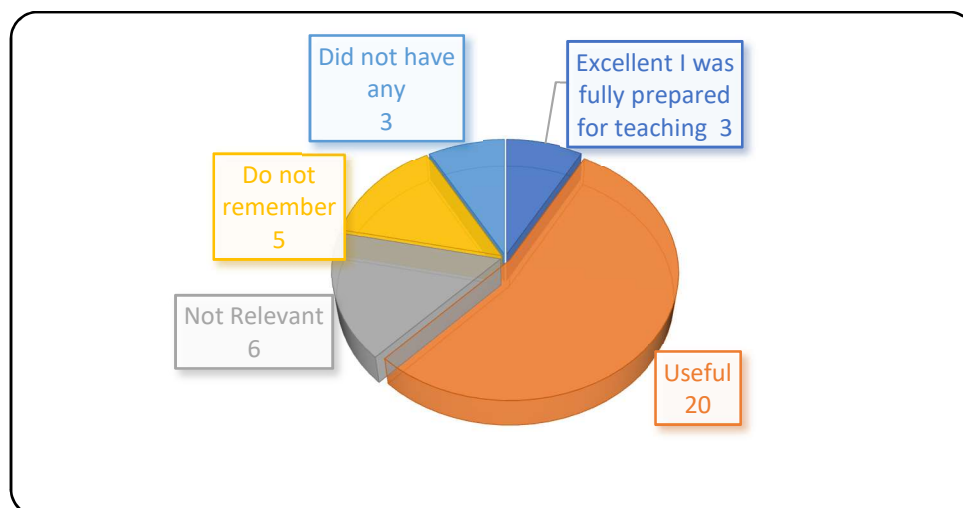
Figure 4.7 ITE in Assessment for SC Participants

From the MTP cohort 12 participants reported that ITE had prepared them for assessment practice, with 9 participants indicating their practice was useful and 3 participants

said that they were excellently prepared for classroom practice in assessment. In the SC cohort, 23 participants indicated that ITE had prepared them for assessment practice with 20 teachers saying it was useful and 3 indicating they were fully prepared for teaching. The difference in the two cohorts can be attributed to the length of time since ITE as the participants in the SC participants were longer out of ITE. Only six participants in total, three from each cohort, indicated that they were fully prepared for teaching following their learning in assessment during ITE. Participants also indicated that teacher learning in assessment occurred following classroom practice, colleague interaction, inspectorate visits, interaction with the school psychological services and learning as part of another professional development activity.

4.3.4 Current Classroom Practice in Assessment

Following on from the demographic details and data on prior learning, the questionnaire contained descriptor statements of formative assessment in a classroom or teaching context. Figure 4.7 provides a summary of classroom practice in assessment as indicated by MTP and SC participants following completion of survey items. The survey items were grouped into four scales (Appendix A1) according to the key approaches to formative assessment in the classroom. The questionnaire was based upon the validated AfL Audit Instrument developed by Lysaght & O'Leary (2013), to gauge teachers' base line understanding of assessment and the extent to which assessment practices were embedded in their teaching. Additional questions were added by the researcher to gather demographic detail and reflections on the survey instrument. Originally, the instrument was designed for use by teachers in schools to identify individual and combined levels of understanding and use of AfL in teaching and learning and to develop customised on-site teacher professional development. The four scales used by the original authors were:

- Learning intentions and success criteria (LISC)

- Questioning and classroom discussion (QCD)

- Feedback (FB)

- Peer- and Self-Assessment. (PASA)

Participants were required to estimate and self-report the frequency of use of assessment strategies in their own classroom and teaching context (Appendix A1). If a strategy was used 100% of the time the participant indicated that the strategy was Embedded. The choices available were Established 75%; Emerging 50 %; Sporadic 25% and Never 0%. Participants were also given the option of indicating that they did not understand what was being asked. From the data in Fig 4.8, it is apparent that certain assessment strategies were more Embedded and Established in classroom use than others. For example, the use of questions to elicit pupils' prior knowledge on a topic (q 23)[22] was reported as either Established or Embedded by 92% of participants in both cohorts. Item 18 refers to the use of learning intentions as a method of checking pupil progress and recording the outcome during the lesson. This was the least used strategy with no participants from the MTP cohort indicating regular use and only 19% of the SC cohort indicating usage.

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[22] T Q 23 Questions are used to elicit pupils' prior knowledge on a topic.

Assessment Practices Embedded or Established

LISC = Leaning Intentions and Success Criteria; QCD = Questioning and Classroom Discussion; FB = Feedback; PASA = Peer Assessment and Self-Assessment
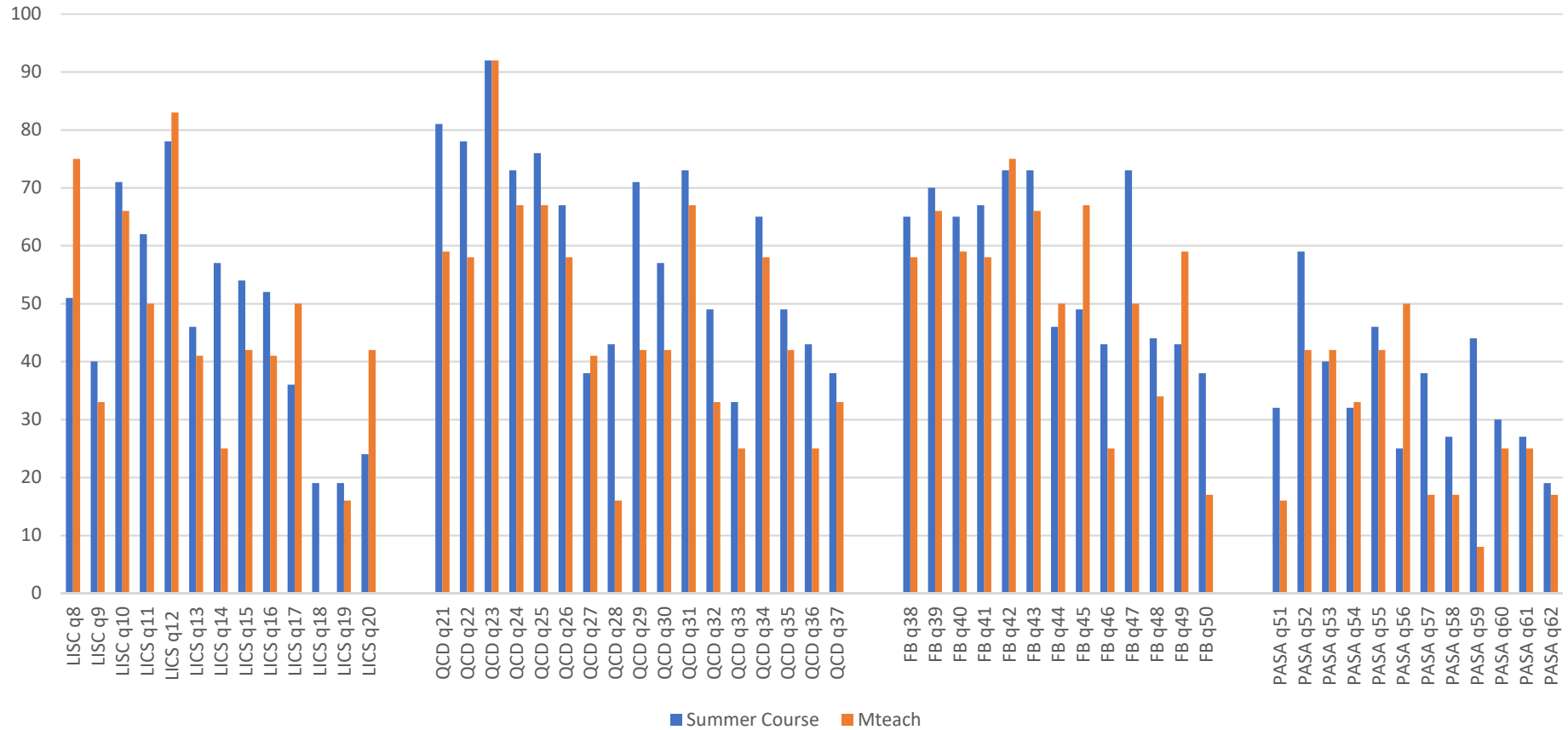
Figure 4.8 Embedded and Established Practice Comparison

Table 4.3 Key to Audit Instrument Items

Q. 8T Learning intentions are shared with pupils at appropriate times during lessons (e.g., Halfway through the lesson, the teacher might say: "Remember, we are learning to distinguish between 2D and 3D shapes").

Q9 T Learning intentions are stated using words that emphasise knowledge, skills, concepts and/or attitudes i.e., what the pupils are learning NOT what they are doing.

Q10T Pupils are reminded about the links between what they are learning and the big learning picture

Q 11 P Pupils are provided with opportunities to internalise learning intentions by, for example, being invited to read them aloud and/or restate them in their own words.

Q 12 T Child friendly language is used to share learning intentions with pupils e.g. we are learning to make a good guess (prediction) about what is going to happen in the story.

Q 13 T Success criteria relating to learning intentions are differentiated and shared with pupils.

Q 14 P Samples of work are used to help pupils develop "a nose for quality".

Q 15 T Assessment techniques are used to assess pupils' prior learning (e.g., concept mapping…).

Q 16 T Pupils are reminded of the learning intentions during lessons.

Q 17 P Learning intentions are available throughout lessons in a manner that is accessible and meaningful for all pupils (e.g., written on the black/whiteboard and/or in pictorial form for junior classes).

Q 18 T Pupils' progress against key learning intentions is noted and/or recorded as part of lessons

Q 19P Pupils demonstrate that they are using learning intentions and/or success criteria while they are working

Q 20 P Pupils are given responsibility for checking their own learning against the success criteria of lessons.

Q 21T When planning lessons, key, open-ended questions are identified to ensure that pupils engage actively in lessons

Q 22 T Assessment techniques are used to facilitate class discussion (e.g., brainstorming)

T Q 23 Questions are used to elicit pupils' prior knowledge on a topic.

T Q 24 During lessons, hinge questions are used to determine pupils' progress in lessons

Q 25T Assessment techniques are used to activate pupils /get them thinking during discussions and/or questioning

Q 26 T Assessment techniques are used that encourage all pupils to engage with questions e.g. no hands up, names out of a hat

Q 27 P Assessment techniques are used to encourage questioning of the teacher by pupils (e.g., using hot-seating or a Post-Its challenge).

Q 28T Questioning goes beyond one right answer style

Q 29T The pace of discussion is slowed down and pupils are encouraged to think before responding e.g. wait time.

PQ 30 Pupils are asked to explore their own ideas with others, using think-pair-share, for example.

Q 31 P Pupils are encouraged to share the questioning role with the pupil i.e. teacher routinely invites pupils to question their peers' contribution to discussion.

Q 32P Individual answers to questions are supplemented by pupils taking an answer round the class so that a selection of responses from the pupils is used to build a better answer.

Q 33T Pupils' incorrect responses are used to guide teaching and learning (e.g., a pupil is asked to explain why he/she gave a particular answer).

Q 34P Pupils are asked to evaluate their peers' responses to questions

Q 35 P Pupils can explain to others what they are learning

Q 36P Pupils are asked to explain why they are undertaking particular tasks

T q.38 Feedback to pupils is focused on the original learning intention(s) and success criteria

T Q 39. Assessment techniques are used during lessons to help the teacher determine how well pupils understand what is being taught

T Q. 40 Written feedback goes beyond the use of grades and comments such as "well done"

T Q 41 Teacher's praise of pupils is deliberately specific about the nature of the progress e.g. this paragraph really helps me visualise the characters.

T Q. 42Teacher made tests are used diagnostically to identify difficulties and identify strengths and needs in teaching and learning e.g. common mistakes in the teaching of fractions

T Q. 43 Diagnostic information from standardised tests is used to identify strengths and needs in teaching and learning.

P Q. 44 pupils are involved formally in providing information about their learning to parents / guardians e.g. through portfolios or learning logs taken home.

T Q. 45 Feedback focuses on one or two specified areas for improvement at any one time e.g. in written work punctuation errors will not be marked if the focus is adjectives.
T Q. 46 Closing-the-gap-feedback is used to focus pupils' attention on the next step in their learning
T Q. 47 When providing feedback, the teacher goes beyond giving pupils the correct answer and uses a variety of prompts to help them progress
T Q. 48 In preparing to provide pupils with feedback on their learning, the teacher consults their records of achievement against key learning intentions from previous lessons
T Q. 49 Pupils are provided with information on their learning on a minute-by-minute, day-by-day basis rather than end of week/month/term.
P Q 51. Pupils are encouraged to record their progress using, for example, learning logs.
P Q. 52. Lessons on new topics begin with pupils being invited to reflect on their prior learning
P Q. 53. Pupils are provided with opportunities to reflect on, and talk about, their learning, progress and goals
P Q. 54. Pupils assess and comment on each other's work
P Q. 55 pupils are encouraged to use a range of assessment techniques to review their own learning e.g. rubric, traffic lights, thumbs up.
P Q. 56. Time is set aside during lessons to allow for self- and peer-assessment.
P Q. 57 Assessment techniques are used to create an environment in which pupils can be honest about areas where they are experiencing difficulty
P Q 58 When pupils have difficulty in their learning they are encouraged to draw on a range of self-assessment strategies and techniques to overcome the problem e.g. an exemplar on the bulletin board.
P Q. 59 Pupils use each other as resources for learning
P Q. 60 Time is set aside during parent/guardian-teacher meetings for pupils to be involved in reporting on some aspects of their learning
P Q. 61 Pupils use differentiated success criteria to self- and/or peer-assess
P Q. 62. Pupils have ready access to exemplar materials showing work at different levels of achievement across a range of subject areas

Other single strategies had high values for being either Established or Embedded in both cohorts. These included the use of child friendly language to state learning intentions (q 12) where 78% of SC participants and 83% of MTP indicated that this practice was either Embedded or Established. The use of teacher made diagnostic tests to identify difficulties (q 42)[23] was Embedded or Established by 75% of MTP participants and 73% of SC participants. It is also worth noting that although the number in each cohort varied (SC=35; MTP=12) when percentages were used, there seemed little variation between the cohorts in the proportion of responses in the five main categories of Embedded, Established, Emerging, Sporadic and Never. (Appendix A1) Fig. 4.8 shows that for the MPT cohort and the SC cohort Emerging and Established were the largest categories with Never being the smallest category.

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[23] Q. 42Teacher made tests are used diagnostically to identify difficulties and identify strengths and needs in teaching and learning e.g. common mistakes in the teaching of fractions

Summer Course Participants: STRATEGIES

Embedded 20%, Established 31%, Emerging 28%, Sporadic 15%, Never 6%

- Embedded ■ Established ■ Emerging ■ Sporadic ■ Never

MTeach Programme: STRATEGIES

Embedded 18%, Established 26%, Emerging 29%, Sporadic 18%, Never 9%

- Embedded
- Established
- Emerging
- Sporadic
- Never Used the Strategy
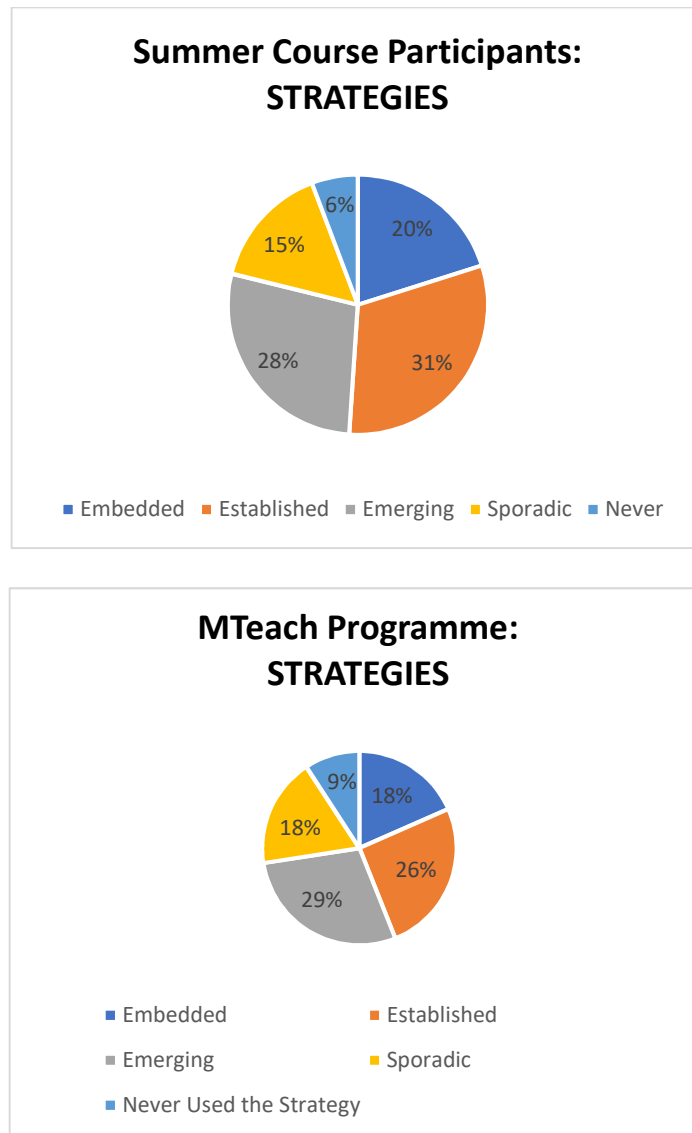
Figure 4.9 Overall Level of Classroom Use of Strategies

For the MTP cohort, the categories of sporadic and never came to 27% and for the SC cohort sporadic and totalled 21%. In addition, when the mean was calculated for each scale the main approaches to classroom assessment were found to be either Established or Emerging. Table 4.4 summarises the findings from both cohorts and for the group as a whole. A value was allocated to each response category from one up to and including five and the mean of the responses to each item were calculated (Appendix J) followed by the overall mean for each scale.

Table 4.4 Mean Scores for Each Scale

Group	Scale 1 Learning Intention and Success Criteria	Scale 2 Questioning and Classroom Discussion	Scale 3 Feedback	Scale 4 Peer- and Self-Assessment
SC	2.57 Emerging	2.35 Established	2.35 Established	3.06 Emerging
MTP	2.71 Emerging	2.59 Emerging	2.40 Established	3.17 Emerging
Total	2.64 Emerging	2.47 Established	2.38 Established	3.12 Emerging
1 = Embedded	2 = Established	3 = Emerging	4 = Sporadic	5 = Never

The numbers were then examined to identify the category to which they were closest.

These findings reported here differ from the findings arrived at during the development of the original AfL Audit Instrument (Lysaght & O'Leary, 2013). Given the difference in size of each cohort and the difference in design between this study and the original study (Lysaght & O'Leary, 2013), it is not possible to establish if the difference is statistically significant. The original study concluded that the first three scales, LISC, QCD and FB were closer to Emerging and scale four, PASA was Sporadic.

However, the findings from the group of participants in this study indicated that scale one, LISC and scale four PASA are Emerging while scale two, QCD, and three FB are closer to Established. Nonetheless, both studies indicated that when the strategies were rank ordered by participant rating (Appendix A1) it was found that the majority of the lower ranking items came from the PASA scale. In the current study, nine of the thirteen lowest ranking strategies were from the PASA scale. When the SC and MTP rank orders were compared (Appendix K) the findings were similar. The original study (Lysaght & O'Leary, 2013), concluded that ten of the thirteen lowest ranking items came from the PASA scale "suggesting that this particular AfL strategy features most infrequently in the classrooms surveyed" (p.43).

This ranking is also reflected in the items with high rank ordering in this study which indicates that of seven the thirteen highest ranked strategies came from the QCD scale, three from FB and three from SCLI. Item 49[24] from the PASA scale was ranked the highest of the PASA items at twenty-three out of total of fifty-four items. The qualitative data reflected similar thinking from the participants themselves who post-survey observed, that self- assessment and peer-assessment were areas that they needed to develop as teachers. Responding to item 65 of reflective questionnaire one, a participant commented that:

> "I also need to work on peer and self-assessment as these were the questions in particular, I found myself ticking " sporadic". I need to teach specific self-assessment strategies to help equip the children with the What I can do when I'm stuck skill." (MT4; RQ1; q65)[25]

Another participant indicated that "from these questions I understand I am not using enough peer assessment in my teaching. I do not allow the children to examine other children's work and make worthwhile comments" (SC3; RQ1; q65). More comments reflecting the same thinking from participants indicated a heightened awareness of the need to develop PASA including "I will definitely concentrate more on giving the pupils in my class more time to assess and discuss their work. Also, to encourage more peer assessment" (SC36; RQ1; q65).

It was also interesting to note that even though participants indicated that strategies were Embedded or Established, qualitative data did indicate that participants may not have been aware that this constituted assessment before taking the survey. This situation was evident when on participant remarked:

> Brainstorming methods, questioning children on how and why they gave an answer and feedback comments are all forms of assessment I constantly use

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[24] Q. 49 Pupils are provided with information on their learning on a minute-by-minute, day-by-day basis rather than end of week/month/term.

[25] Participants are coded SC1-35 for Summer Course students and MT 1-12 foe the Masters in Teaching cohort. A reflective questionnaire was completed by the participants at four points in the PD activity.

> in the classroom without even thinking that I am assessing the children. These are natural teaching methods that I have not thought as of assessment methods. (SC10M1Q64)

Another teacher said she "forget[s] that by discussing what the children know and brainstorming before a lesson is assessing what they know (even though it sounds obvious!)" (SC6; RQ1; q64). While another response indicated a shift in the value placed on a classroom activity saying "general discussions before and after lessons that talk about what we will/did learn are more valuable than I had thought"(SC5; RQ1; q64) and a separate response demonstrates a similar outcome with a teacher stating "I have realised that a lot of the questioning I have been doing is assessment and I need to take more note of this as this provides a basis from further [pupil] learning"(MT8; RQ1; q64). Researcher fieldnotes from the face-to-face session with the MTP cohort also provided evidence of participants being unaware that classroom practice such as gathering information to plan for learning constituted assessment (FN, June 30th Appendix F).

Cognisance must be taken of the fact that there are significant differences between this study and the original study. The original instrument was developed using a larger sample; between 473 to 463 participants responded to each item. In addition, the statistical treatment of the data was inferential, whereas this study has used descriptive statistics. Participants in the original survey were drawn from thirty-six schools where principals had responded to an invitation to take part in the study or staff members were already known to the researchers. The participants in this study however, were enrolled on a professional development activity and the data collected from the survey instrument was part of a reflective task. It is also worth noting however, that there are some similarities. The original sample was mostly female (89%) working as mainstream class teachers or teaching principals (70%). The sample in this study were 89% (n=42) female with 80% (n=38) of participants working in

mainstream classrooms or as teaching principals. The remaining 20% (n=7) worked as learning support teachers, resource teachers or substitute teachers. This is slightly less than the value of 25% for the overall teaching population. The difference in findings cannot be attributed definitively to any particular factor, but several issues may warrant further investigation. These factors could include an investigation into assessment education as part of other professional development activities that have been offered to the teacher population in the past three years since the original study was conducted. Indeed, many participants in this study referred to assessment education as part of another professional development activity as a source of recent learning in assessment.

4.3.4.1 Teacher Led Assessment / Student Led Assessment

It is interesting that responses on the questionnaire show that participants indicate higher levels of Embedded and Established use of teacher orientated or teacher led assessment strategies, than strategies that are student orientated strategies. For example, participants show high level of teacher led use of learning intention (q 12)[26] but much lower levels of embedded or established practice when students are required to lead the strategy use (q 18 and q 19)[27]. These items refer to pupil progress being compared to success criteria and learning intentions and pupils demonstrating the use of learning intentions and success criteria throughout the lesson. Data from Fig. 4.7 indicate a similar situation with the use of questioning as an assessment strategy. Items that require teacher-led use of questioning have higher reported values of being Embedded or Established than those strategies where students are required to

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[26] Q 12 T Child friendly language is used to share learning intentions with pupils e.g. we are learning to make a good guess (prediction) about what is going to happen in the story.
[27] Q 18 T Pupils' progress against key learning intentions is noted and/or recorded as part of lessons.
 Q 19P Pupils demonstrate that they are using learning intentions and/or success criteria while they are working.

be more actively involved. For example, the sharing the questioning role with the teacher (q 27)[28] was reported as Embedded or Established by 38% of SC participants and 41% of MTP participants. Questioning the teacher (q 28)[29] was reported as Embedded or Established by 43% of SC participants and 16% of MTP participants. One possible explanation for questioning the teacher being more Embedded among the SC participants could be the higher levels of experience among the SC participants. The findings overall reflect the conclusion of Lysaght & O'Leary (2013). They commented that the challenge for improving assessment lies in involving the student more in the assessment process moving away from the teacher as assessment instigator.
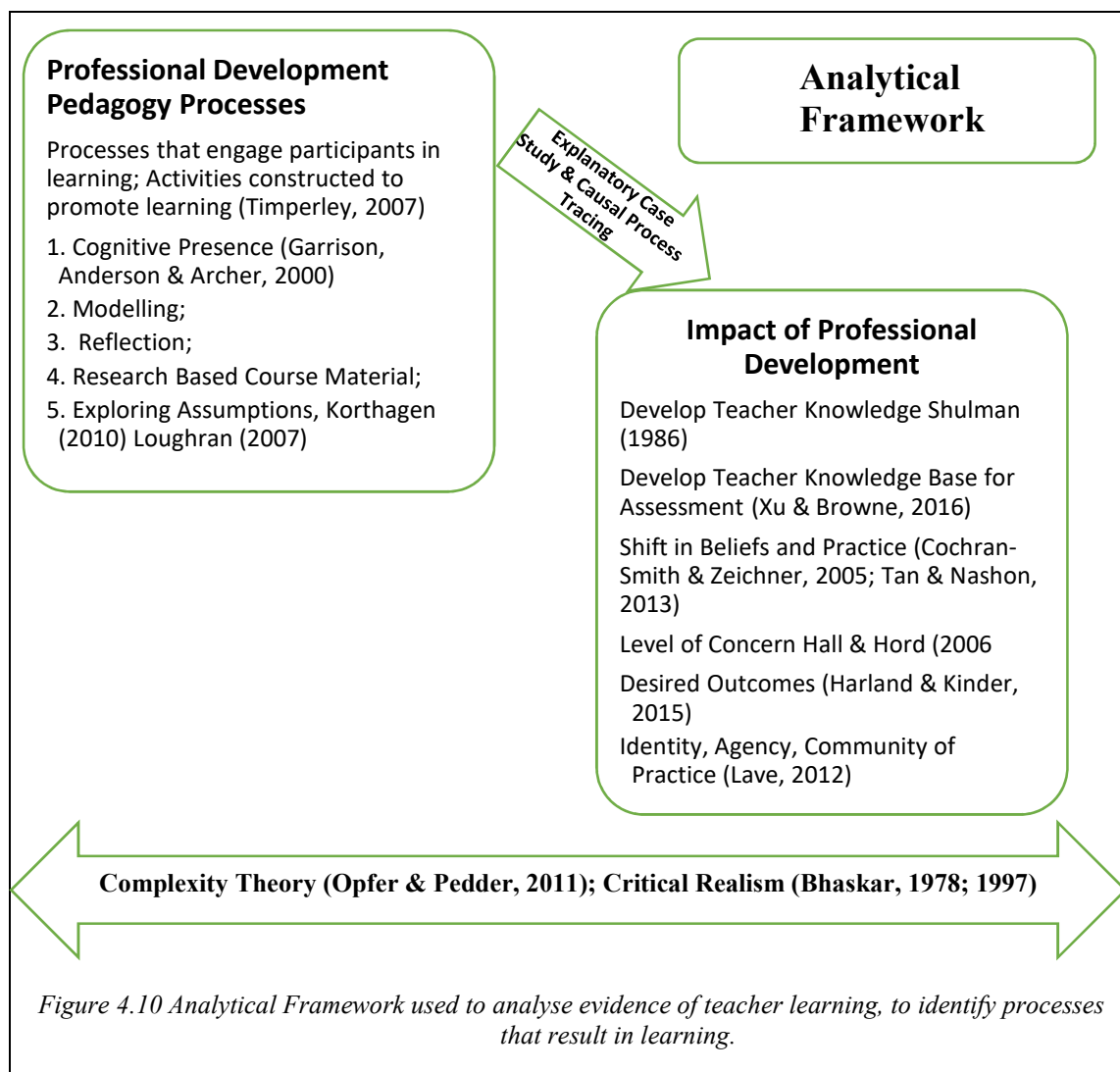
The data collected to establish the profile of the participants in the study as a whole, indicated that prior learning has taken place in assessment and participants have identified sources of learning other than formal instruction at ITE. Sources of learning included classroom practice, colleagues, inspectorate, psychological services and assessment education as part of another professional development activity. However, in keeping with the data from the original survey instrument (Lysaght & O'Leary, 2013), teacher led assessment strategies are a more established part of classroom practice than pupil led assessment strategies. Variations in teaching context and teaching experience were evident from the participant data with the MTP cohort having less experience than the SC cohort. The next section presents findings the key findings with regard to the pedagogical processes that bring about learning in the interactive asynchronous professional development setting.

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[28] Q 27 P Assessment techniques are used to encourage questioning of the teacher by pupils (e.g., using hot-seating or a Post-Its challenge).
[29] Q 28T Questioning goes beyond one right answer style

4.4 Progressing the Learning: A Move Beyond Established Profiles

Teacher learning became evident in several ways during and following professional development. These included a shift in teacher thinking or beliefs (Cochran-Smith & Zeichner, 2005), development of teacher knowledge (Shulman 1986), and levels of classroom and school impact following a professional development activity (Hall & Hord, 2006; Harland & Kinder, 2015). Teacher assessment identity and agency also formed part of the framework. The analytical framework (Figure 4.10) used in this study contains the key elements utilised to examine participant contributions, researcher fieldnotes (Appendix K), and inspectorate feedback (Appendix M), for evidence of teacher learning and identifying the processes that have resulted in teacher learning.

Professional Development Pedagogy Processes

Processes that engage participants in learning; Activities constructed to promote learning (Timperley, 2007)

1. Cognitive Presence (Garrison, Anderson & Archer, 2000)
2. Modelling;
3. Reflection;
4. Research Based Course Material;
5. Exploring Assumptions, Korthagen (2010) Loughran (2007)

Explanatory Case Study & Causal Process Tracing

Analytical Framework

Impact of Professional Development

Develop Teacher Knowledge Shulman (1986)

Develop Teacher Knowledge Base for Assessment (Xu & Browne, 2016)

Shift in Beliefs and Practice (Cochran-Smith & Zeichner, 2005; Tan & Nashon, 2013)

Level of Concern Hall & Hord (2006

Desired Outcomes (Harland & Kinder, 2015)

Identity, Agency, Community of Practice (Lave, 2012)

Complexity Theory (Opfer & Pedder, 2011); Critical Realism (Bhaskar, 1978; 1997)

Figure 4.10 Analytical Framework used to analyse evidence of teacher learning, to identify processes that result in learning.

This section examines the pedagogical approaches that have initiated the learning process for teachers. The approaches discussed included assessment as pedagogy, modelling in an asynchronous setting, and the use of research bases assessment materials and writing as pedagogy. The second research question focuses on the effect of the asynchronous online learning environment on teacher learning, is discussed in the sections online practices and teacher agency and identity.

4.4.1 Assessment as a Pedagogy

The literature identifies the importance of modelling assessment practices, providing explicit instruction in assessment practices (De Luca et al., 2013; Abell &

Siegel, 2009), and teachers experiencing assessment as learners (Crowe & Berry, 2007), to develop assessment literacy. During interactive asynchronous online professional development, modelling is done by way of direct use of assessment strategies, direct instruction and video demonstrations of classroom techniques followed by reflection. Table 4.5 provides a brief outline of the assessment approaches used during the professional development activity. As can be seen in Table 4.5, during the course, a variety of assessment approaches were used during modelling and direct instruction on assessment. These included use of learning intentions and success criteria, feedback, self-assessment, questioning and discussion and planning for new learning.

Table 4.5 Assessment Features of Professional Development Activity

	Modelling Assessment Practices	Explicit Instruction	Participant Experience of Assessment
Module 1 Introduction to Assessment	Research based questionnaire; Podcast; Learning Intentions and Success Criteria;	Research based questionnaire; Podcast; Professional Readings; Facilitator-researcher Presentation	Feedback, Self-Assessment, Questioning, Writing, Reflection; Individual Email if Needed
Module 2 Classroom Strategies	Professional Readings; Video Clip; Learning Intentions and Success Criteria	Professional Readings; AfL Checklist	Feedback; Self-Assessment Quiz; Self-Assessment Writing, Reflection. Individual Email if Needed
Module 3 Assessing Writing	Video Clips; Professional Readings; Learning Intentions and Success Criteria	Research based Assessment Tools; Professional Readings; Facilitator-researcher Presentation.	Feedback on planning task; Reflection, Writing. Individual Email if Needed
Module 4 Assessing Oral Language	Learning Intentions; Video Clip How to Assess Oral Language; Checklist to plan Oral Language Teaching	Facilitator-researcher Presentation; Professional Reading; Taxonomy of Verbs to Devise Learning Tasks	Feedback on forum contributions; Self-Assessment; Writing; Reflection, Individual Email if Needed
Module 5 Assessing Reading	Learning Intentions; Video Clips Self-Assessment and Peer Assessment of Reading; One Minute Fluency Probe; Reading Tasks Video Clip	Professional Readings; Research Based Course Material;	Feedback on forum contributions; Self-Assessment; Questioning; Writing; Reflection, Individual Email if Needed

4.4.1.1 Modelling

The idea of modelling in teacher education is taken to mean a demonstration of exemplary practice alongside the opportunity to critique and interrogate to learn about teaching (Loughran, 2006). In an asynchronous learning environment, this

principle was enacted through the direct use of assessment approaches such as the use of success criteria, learning intentions, questioning and feedback during the professional development activity combined with reflection on the techniques experienced. Modelling was explicated through the use of video clips of exemplary practice, followed by opportunities to reflect.

The data from the asynchronous online discussions, online tasks and final questionnaire indicate that demonstration of assessment practices along with direct instruction of assessment theory and practice resulted in teacher learning about assessment. The learning was evident in the discussion forum contributions and reflection on learning. However, the learning was deeper when the participant was required to reflect upon the content, relate the content to their own professional context and plan for changes. In particular, the comments made during discussion fora indicated learning about assessment of writing. For example, this comment reflected the typical response to assessing writing:

> I agree with Seán's comment about the video clip on "conferencing" advocating a respectful approach when engaging in discussion with a child about their work. It was such a worthwhile engagement with a pupil to witness, as well as the teacher being so respectful, it also was completely empowering the pupil to take ownership of their learning. The learning that took place within that space of time was so much more beneficial to the pupil than being handed back a copybook page marked with red pen, that the pupil won't look at and took a lot of time out the teacher's evening to correct. Having the success criteria stuck into the child's writing book allows for constant self-assessment and peer assessment and it was so inspiring to see the pupil and teacher use it together to set new learning goals. The writing conference allowed for complete differentiation as the teacher could model the skills necessary for that pupil, for example in the case of the girl in the video, she needed to work on using richer vocabulary and the teacher introduced the use of a spider diagram and thesaurus. I have used "conferencing" when I had sixth class but not since but I feel this module will enable me to be more specific and focused when engaged in conferencing with a pupil. (M6; RC3b)[30]

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[30] Task 3b Forum Post in Response to Video clip on Assessment of Writing during a writing conference

The participant is able to envision new learning in assessment in their own context while at the same time interrogating the practice presented in the video. The contribution allows the participant to explore the teacher and student perspective. Another forum contribution from a different discussion thread about the modelling of the writing conference as a method of assessment, indicated that modelling of an assessment strategy through the use of video, is effective as a method of developing assessment literacy:

> I agree James - I thought the video was an excellent demonstration of a writing conference. I have some experience of conducting writing conferences in my classroom and in a third/fourth class setting, it works very well. I agree that it would be a good idea to introduce the concept of conferencing with the children early on in their schooling to make the conferences more productive as the children move up through the school. In my experience, it does take practice, patience and time to establish conferencing as routine but it is time well spent. The children generally demonstrate a wide range of writing abilities and that is exactly why it is so important to conduct individual conferences with the child and provide learning directions tailored to their own individual learning needs – there is no "one size fits all" model when it comes to writing! (M3; RC3b)

The participant is able to relate the modelling to their own experience of assessing writing and acknowledges the challenge of introducing a new strategy in the classroom. The contribution also shows an awareness of the role of the individual teacher in new learning and of the need to respond to the individual learning needs of each student. The responses from the SC cohort indicated fifteen participants would use the conferencing approach to assess writing in response to video. Others indicated they would use group or class writing conferences having watched the video. The data from the second reflective questionnaire administered as part of Module 5 (Appendix C), and the follow-up questionnaires (Appendix D), indicated that learning had taken place following assessment tasks set by the facilitator-researcher, however, apart from the reflection, none of the participants indicated that that their experience of

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assessment techniques on the course contributed to their learning in assessment. Indeed, many participants expressed frustration following the self-assessment activity, as the quiz was not in a multiple choice or short answer format. Participants were required to describe the key elements of formative assessment. Following submission participants were required to compare their answer to the professional reading and indicate whether they thought their answer was correct. Participants wanted instant feedback and found the task of carrying out self-assessment by comparing their answer to the original source, frustrating as it was, untypical of the type of responses required during asynchronous online professional development activities. However, the facilitator-researcher did see evidence of learning following the self-assessment activity, and noted in her reflective journal that participants did not indicate directly that their experience of self-assessment contributed to their learning as teachers.

4.4.2 Use of Research Based Assessment Materials as Generator of Learning

Creating an assessment discourse through the use of research based course materials in the classroom, such as the *Drumcondra English Profiles* (Shiel & Murphy, 2000), resulted in developing knowledge about assessment of oral language. One participant commented that:

> I have no experience of using the Drumcondra English Profiles. From reading the manual, it appears to be a very thorough way to assess literacy and manages also to integrate formative assessment with summative assessment. I would be interested to hear from anyone who has used the Drumcondra English Profiles, how it worked for them in the context of their own class. (MT3; RC4b)

The contribution resulted in a discussion of experiences, exchange of practice and contributions from participants planning to use the profiles as an assessment approach in the teaching of reading, writing and oral language. For example, one comment that reflected the attitude of other participants was "The checklists from the Appendix of the Drumcondra English Profiles will definitely be a resource I will use." (SC17;

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RC4c) Another participant added "The checklists are very helpful as they not only provide a tool for assessment of oral language, but they can also serve as criteria for success for students, particularly when used for peer assessment." (SC25; RC4c) Teachers are able to envision the integration of the new assessment material to develop assessment approaches in their own classroom settings along with an understanding of the assessment purpose. Checklists from the indicators as a method of assessment may not be of any benefit to a student if the information gathered from the instrument is not used to plan for the next stage of learning.

The format of the new Primary Language Curriculum (DES, 2015) was also identified as a structure that could support assessment. Participants were asked to plan for, and identify assessment strategies to support learning from the new curriculum document it became evident that participants were able to envision the structure as a basis for assessment.

One participant contribution perhaps sums up the overall reaction:

> I like the idea of assessing through the use of the milestones in the new language curriculum, and can use this as a guide to create my own rubrics and analysis tools, to make my assessment of oral language more meaningful, have to say that the new Primary Language Curriculum will be of huge help to me in the area of oral language. It will be so much clearer as to what exactly I am assessing and what the next step in learning will be. I always felt, as have my colleagues, the oral language was the one area of the English curriculum we struggled to assess effectively. It was an area that was difficult to pin down, to assess subjectively. I will feel much more confident now with the new curriculum to guide me as the progression milestones are very clear and precise. (SC29; RC4c)

The participant is ready to adapt the research based material for their own context, while at the same time acknowledging an area of practice that needs to be developed. This goes beyond transmission of knowledge and results in creating a discourse around assessment practice. A willingness to share and collaborate with others is also

identified and as learning, this disposition is discussed later in the chapter when the process of deepening the learning through reflection is explored in greater depth.

4.4.3 Writing as Pedagogy

Presenting new assessment information or strategy to teachers is not sufficient to bring about learning. Loughran (2007), maintained that effective pedagogical processes involve moving beyond technical competence but developing and understanding of the purpose and theory behind new strategies. Korthagen (2010), extends this idea by advocating the use of writing tasks as an opportunity to develop metacognition and process reactions to uncover gestalts and articulate new understandings as schemas. Even though Korthagen's (2010), research is based in a pre-service ITE setting, and not referring to learning in assessment, the process of engaging in writing tasks to learn can be equally useful in a professional development setting as the comments below provide evidence of the participants' reaction to the written contributions in response to the modelling and direct instruction.

"Writing the assignments kept me focused but very aware that have alot more to learn about assessment". (SC7; RQ2; q1)[31]

"The reflective journal and forum post essentially forced me to reflect." (SC33; RQ2; q1)

"I also found that writing a journal entry, posting to the forum, and completing an assignment at the end of each module greatly helped me to assess my own teaching in light of my reading" (SC29; RQ2; q1)

Apart from the process of writing as a method of progressing the learning, writing also form part of the reflective process and was a way of deepening teacher learning.

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[31] RQ2; q1: Describe how you learned best during this course.

4.5 Deepening the Learning: Reflection as Pedagogy

Different types of reflective tasks were undertaken by the participants. These included the reflective question in section three of the first questionnaire (RQ1) designed to prompt reflection upon classroom practice, response to professional readings, response to a video clip of assessment practice and reflection on learning during the course. The data generated from the participant responses was then analysed to identify evidence of learning using the frameworks devised by Hall & Hord (2006), and Harland & Kinder (2015). The first framework views learning a concern and the second framework categorises learning as outcomes.

The use of reflective coursework is important during professional development irrespective of the setting (Leahy & Wiliam, 2009). According to the literature the use of reflection appeared to have different functions. In the study conducted by De Luca et al (2013), reflective coursework was used more as feedback for the course organisers, than as a learning tool even though participants were asked if they considered it useful. In contrast Korthagen (2010), and Loughran (1997, 2007), saw reflection as a direct tool to support teacher learning by helping teachers gain insight into practice. In this study, reflection was used as a learning tool. But the use of reflection emerged as having two distinct functions. Table 4.6 provides an overview of the reflective tasks required for course completion during each module.

Table 4.6 Reflective Coursework Tasks

Module		Task Number
Module 1	Formative Assessment An Overview	1a Practice based questionnaire; RC 1c Assessment Journal
Module 2	Specific Strategies for Formative Assessment	RC 2a Response to Professional Reading; RC2c Assessment Journal
Module 3	Assessment of Writing	RC3b Forum Post; RC3c Assessment Journal;
Module 4	Assessment of Oral Language	RC4b Forum Post; RC4c Assessment Journal;
Module 5	Assessment of Reading	RC5b Forum Post; RC5c Assessment Journal; RQ5d Questionnaire; DES Learning Record

The first four modules contained two reflective tasks and the fifth module had four reflective tasks. All tasks were required to be completed in sequence before the participant could progress to the next module or be eligible for a certificate of completion.

Previous research into teacher learning about assessment, based in an ITE setting, concluded that reflective coursework was not viewed by participants as beneficial to their learning about assessment (De Luca et al., 2013). However, the forty-seven participants in this study who were all serving teachers, each indicated through specific reflective course work responses, or direct questioning that written reflective activities helped their learning. In response to the question of how you learned best one individual commented "I liked that I was given the opportunity to reflect on my own practice through the classroom practice surveys. This gave me a chance to identify areas where my assessment practice could be improved." (SC23; RQ2; q1)[32] Another participant, when asked to comment on their learning throughout the five modules, commented "During this course, I learned best when encouraged to think reflectively on my current practice. This reflective thinking came from reflective questions" (MT12; RQ2; q1).

Evidence of learning by engaging with the reflective pedagogical process initiated by the instructor was clear. This was separate from the self-reported benefit of reflection as commented upon by the participants. Participant responses which contained evidence of knowledge development, change in belief, change in practice and cognitive presence were identified. Some responses contained overlapping evidence.

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[32]Describe how you learned best during this course.

4.5.1 Learning as *Concern*

As referred to earlier, the data were a source of information about the nature of participant learning during the professional development activity. In the literature, reaction or response to professional development is described as a "concern" by Hall & Hord (2006) who categorised seven stages of concern shown by teachers in response to a professional development activity (Table 4.7). The seven stages of concern began with the teacher being unconcerned, progressing to the informational stage where the teacher has knowledge of the new learning. This is followed by the personal stage where the teacher alludes to their individual ability to carry out a new strategy which leads to the management stage where the teacher is concerned with the logistics of trying out new learning. The level of concern for new material and new practices was outlined in a continuum format. Table 4.7 provides a descriptor of each stage of concern indicating the level of learning attained by teachers.

Table 4.7 Level of Concern in response to professional Development (Hall & Hord, 2006)

Level of Concern	Description
6 Refocusing	Considering making modifications to the innovation
5 Collaboration	Working jointly with others to benefit students
4 Consequence	Concerned about the impact of the innovation on students
3 Management	Concerned about management and logistics of new innovation
2 Personal	Concern about ability to carry out task; personal investment required
1 Informational	General awareness of the innovation and desire to learn more
0 Unconcerned	Little or no interest in innovation

This framework was used to examine the data generated by reflective coursework. The first task was a sixty-nine-item questionnaire (Appendix A1), designed to allow participants to reflect upon their current classroom practice. As noted earlier, the questionnaire was based upon the AfL Audit Instrument developed by Lysaght &

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O'Leary (2013); additional items added by the researcher asked participants to reflect on the assessment descriptors in the four scales and following reading the descriptors they might change their classroom practice in assessment and why. Changes in belief and practice indicate a level of teacher learning (Hall & Hord, 2006; Shulman, 1986). Of the forty-seven participants that completed the task only two participants replied that they would make no changes to their current practice in classroom assessment. The second questionnaire (Appendix C), required participants to reflect upon the learning processes, change in beliefs and planned change in practice. The follow up questionnaire (Appendix D), was administered when participants returned to the classroom. Figures 4.11 to 4.13 summarise the findings regarding teacher learning as evident from the questionnaire responses. At the outset, the teacher learning was focused upon the impact of present assessment methods on students as can be seen in Figure 4.11. This changed however, as the professional development activity progressed to concern as to how the new learning can be implemented from a personal stance or from a management stance (Figure 4.12). The follow-up data, even though it is collected from a smaller cohort (n=10) indicated that Personal and Management issues were no longer to the fore, but Collaboration and Consequence (Figure 4.13) emerged as the learning levels.
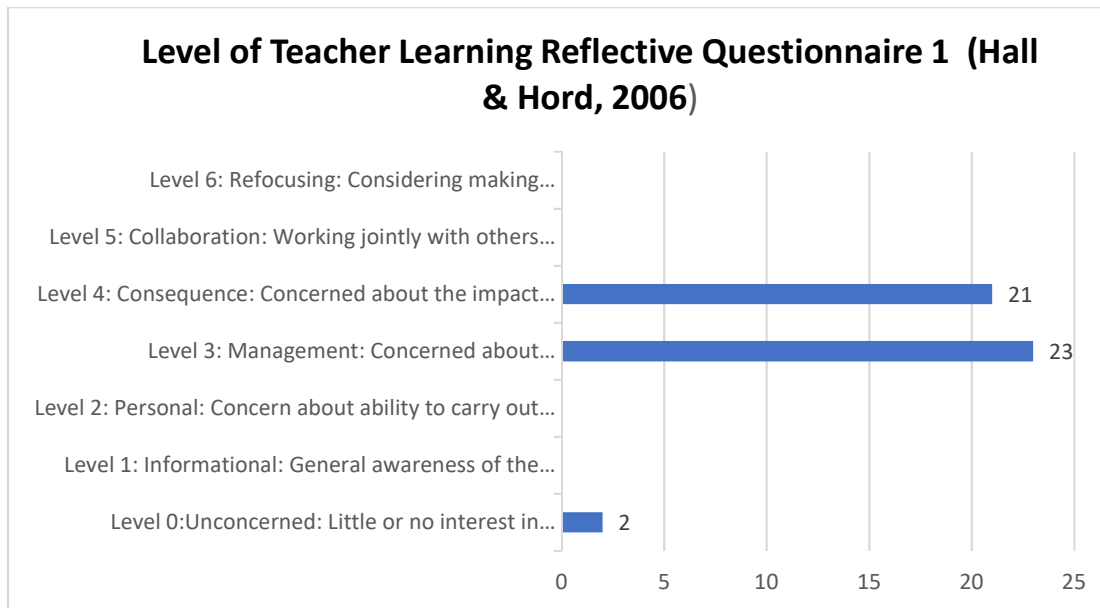
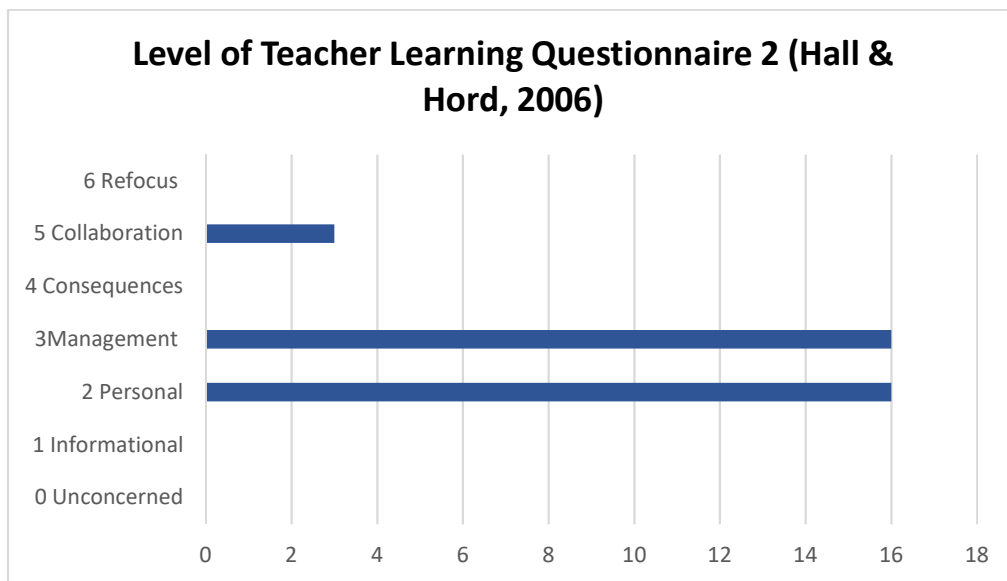**Level of Teacher Learning Reflective Questionnaire 1 (Hall & Hord, 2006)**

Level 6: Refocusing: Considering making…
Level 5: Collaboration: Working jointly with others…
Level 4: Consequence: Concerned about the impact… 21
Level 3: Management: Concerned about… 23
Level 2: Personal: Concern about ability to carry out…
Level 1: Informational: General awareness of the…
Level 0:Unconcerned: Little or no interest in… 2

0 5 10 15 20 25

Figure 4.11 Level of Teacher Learning in Reflective Questionnaire 1 (Hall & Hord, 2006)

Level of Teacher Learning Questionnaire 2 (Hall & Hord, 2006)

6 Refocus
5 Collaboration
4 Consequences
3Management
2 Personal
1 Informational
0 Unconcerned

0 2 4 6 8 10 12 14 16 18

Figure 4.12 Level of Teacher Learning Reflective Questionnaire 2
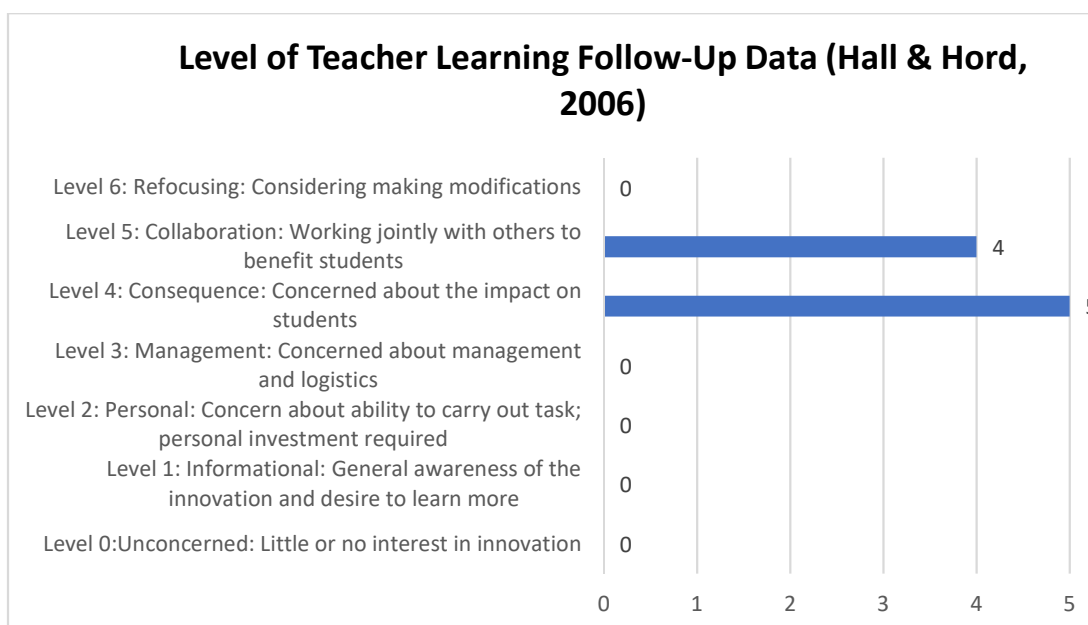
Figure 4.13 Level of Teacher Learning Follow-Up Data (Hall & Hord, 2006)

The response given by one participant indicated a shift in beliefs of what assessment

should look like and a planned shift in practice of classroom assessment:

> "As a mainstream teacher, the Friday "spelling test" became my
> primary form of assessment. It did very little to further inform my
> teaching, apart from working with specific children to aid them with
> phonics skills. Having reflected upon my practice, I would now
> criticise my lacking versatility as an assessor. Furthermore, I would
> be mindful of pupils having only ever been officially assessed in
> their spellings. How did this impact the self-esteem of those for
> whom spelling was not a strength? Why didn't I assess other areas
> of the curriculum more cohesively, favouring feedback over a
> grade?" (MT6 RQ1, q6)[33]

It is worth noting that the participant referred to the impact of the classroom practice

on the self-esteem of the students in her care. This level of teacher learning can be

interpreted on a continuum of reaction to the professional development activity. The

participant in this study is at the next stage of concern, namely consequence, where

the teacher expresses concern for the impact of previous practice of new learning on

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[33] How have you learned about classroom assessment up to now?

students following the teacher's own learning in assessment. The last two stages as described by Hall & Hord (2006), are collaboration and refocusing. Collaboration is characterised by showing interest to work with others to improve practice with the student in mind. Refocusing is modifying the new learning. The participant also shows evidence of adaptive expertise by responding to new learning and being open to leave old routines and assumptions behind (Schwartz et al., 2005; Lysaght, 2012)

 The participant responses following the validated audit instrument (Fig. 4.11) demonstrated learning at the management (n=23) stage and consequence stage (n=21). Learning at the stage of collaboration was demonstrated by three participants. However, it is noteworthy that the follow-up data, collected from ten participants towards the end of September in the classroom, demonstrated learning at consequence (n=5) and collaboration (n=4) stage. The provision of follow-up data was not part of the required course work and this possibly accounts for the lower participation rate compared to the mandatory coursework required to demonstrate meaningful engagement. The participants at the Consequence level in the follow-up data had not progressed, however, the participants at the Collaboration level had progressed from Consequence to Collaboration. One participant was still at management stage citing context and the general busyness of school as barriers to using assessment stating:

> I have had little opportunity so far this year to implement many of the approaches as I am teaching in language support with infants with little to no English. Many of the answers below reflect this fact – I am certain that if I were in a mainstream class or LSRT that it would have a much greater impact …the start of the school year is so busy that starting new whole school initiatives would be a challenge. (M9RQ3)

However, it is notable that earlier, the same participant had stated that:

> I wouldn't necessarily say my beliefs have changed, but more so that they have been reinforced. I have always agreed with the AfL and AoL approaches that we were taught in college, and have implemented them bit by bit, but following this course, I need to place much greater

emphasis on integrating and adding the assessment approaches to the
whole package of teaching and learning. (MT9; RQ2; q8)[34]

The follow up data allowed the facilitator-researcher to identify the level of use of the

new learning in the classroom setting. The participants who provided follow up data

(n=10) ranged from level I Orientation to level V Integration. One participant was at

orientation level, three at routine level, three at refinement and three at integration

level. There was more variation among the level of use than the level of concern (Hall

& Hord, 2006), during the professional development activity.

4.5.2 Learning as *Outcome*

In addition to the framework determining the level of concern and use in

response to a professional development activity, as set out by Hall and Hord (2006),

the outcome of the professional development can be bounded in terms of desired

outcomes. Harland and Kinder (2014), identified a hierarchy of desired outcomes of

CPD, with first order being the most desirable and indicating impact in schools and on

teacher learning. Unlike Hall and Hord's (2006), linear conceptualisation, Harland &

Kinder (2014), suggest that the outcomes are non-linear and non-hierarchical and that

individual teachers develop discrete profiles following professional development

provision. Table 4.8 provides an overview of the outcomes for a sample participant of

using a research based survey instrument as a reflective prompt. The table (4.8)

identifies the outcome achieved by a participant as determined by a reflective

coursework contribution on the first reflective questionnaire (RQ1; q6).

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[34] RQ2; q8: Have your beliefs or thinking about assessment approaches changed after this course? If so
describe what activity, task or resource resulted in this change?

Table 4.8 Outcomes of CPD (Harland & Kinder, 2014)

3rd Order	**Provisionary** Descriptors that can be used later in the classroom.	**New Information** Gained from reading the survey instrument.	**Awareness** "I would now criticise my lacking versatility as an assessor". "I would be mindful of pupils having only ever been officially assessed in their spellings". "It did very little to further inform my teaching".
2nd Order	**Motivation** Participant appears to be motivated to change assessment practices in literacy.	**Affective** "How did this impact the self-esteem of those for whom spelling was not a strength?"	**Institutional** No evidence of school practices.
1st Order	**Value Congruence** "Why didn't I assess other areas of the curriculum more cohesively, favouring feedback over a grade?" "It did very little to further inform my teaching".	**Knowledge** Maybe this will develop throughout the professional development activity.	**Skills** Unsure.

Learning was evident from the contribution suggesting that the process of reflecting using a validated research instrument is worthwhile for participants. Similar contributions were identified from other participants (Appendix A1). Follow-up data provided evidence of institutional outcome and skills outcomes. During the professional development activity, Institutional Outcomes and Skill Outcomes may be more aspirational than actual. Table 4.9 provides a brief summary of the outcomes identified in the follow up data using framework of Harland and Kinder (2015).

Table 4.9 Outcomes of PD Activity from Follow-Up Data

	Provisionary	New Information	Awareness	Motivation	Affective	Institutional	Value congruence	Knowledge	Skills
	3rd Order	3rd Order	3rd Order	2nd Order	2nd Order	2nd order	1st Order	1st Order	1st Order
MT1	Yes	Yes	Yes	Yes	Yes	Somewhat	Yes	Yes	Emerging
MT5	Yes	Yes	Yes	Yes	Yes	Needs more support	Yes	Yes	Yes
MT9	Yes	Yes	No	No	No	No	Yes	Yes	Unknown
SC35	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
M3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SC31	Yes	Yes	Yes	Yes	Yes	Beginning	Yes	Yes	Yes
SC5	No*	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
M7	Yes	Yes	Yes	Yes	Yes	Beginning	Yes	Yes	Yes
M4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SC10	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes

*As reported by the participant

It is worth noting however, that the self-reported follow up data collected in this study differs from the data collected by Harland & Kinder (1991; 2015) which was a combination of observational and self-reported data. The authors do conclude tentatively "that in order to maximise the chances of CPD leading to a change in classroom practice, all nine 'outcomes' need to be present as pre-existing conditions or be achieved by the INSET[35] activities" (Harland & Kinder, 2015). Nonetheless the framework does provide a worthwhile analytical tool to examine data collected from teachers returning to classroom practice following professional development.

In some instances, it was difficult to align the response provided to any particular framework. Participants demonstrated learning at a level where the

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[35] In-service training and education

participant was aware of the need to change and then offered suggestions based on the new learning as to how the change could be affected in the classroom setting. One participant referred to his current classroom practice and commented

> "I would say that I would not always plan for questioning effectively and would be guilty of not always including higher order questions in lessons. In relation to feedback I would always comment on the pupil's work and highlight areas for improvement. I would normally give grades for projects however, I think I will now focus more on target setting rather than giving grades." (MT8; RC2b)

Even though it is difficult to identify the exact level of concern (Hall & Hord, 2006), it is evident that learning has taken place as Cochran-Smith & Zeichner (2005), argue that a change in knowledge or belief indicates teacher learning and indeed argue particular attention should be paid to processes that bring about such change. In addition to evidence of intention to change practice, such as "I will use more exemplars and teach the children to assess and hopefully broaden their understanding of assessment" (SC32; RQ2; q65)[36] the responses to the questionnaires indicated a change in teacher belief which helped to strengthen teacher justification for existing classroom practice in assessment. It was interesting to note, that of the forty-seven participants, twenty-six indicated they were already engaged in strategies which they did not realise were formative assessment strategies. For example, one participant commented that

> "when I look at some of the questions I realise I'm am assessing unknown to myself for example the open-ended questions, the brain storming I thought of these techniques as just part of my lesson not actual assessment" (SC12; RQ1; q64)[37]

Another participant replied

> "I never really thought of the traffic light and thumbs up as assessment. Ditto with pupils reflecting on prior knowledge with

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[36] Based on the descriptors of Assessment in the questionnaire what changes do you think you will make in your classroom practice?

[37] RQ2; q64: Based on the questions you have just answered, is there anything you have been doing but did not realise it was assessment?

brainstorming and mind maps. Actually, this causes me to reflect on my own definition and understanding of assessment." (SC13; RQ1; q64)

The shift in belief to align with a teacher's classroom practice shows a deepening of teacher knowledge about assessment and indicates teacher learning has taken place as a result of the reflective coursework task. Even though Shulman's (1986) idea of equating teacher learning to developing knowledge necessary for the classroom, that is pedagogical content knowledge (PCK), Hill et al (2008), commented that teacher learning could only be identified if the knowledge base to be acquired by the teacher was specified and in turn evaluated. The knowledge base used for the reflective questionnaire has been specified and researched indicating a development of Shulman's (1986), original PCK. It has also been evaluated in a professional learning setting.

4.5.3 Reflection to Make Learning Visible: The Teacher Educator Perspective

The contributions made by participants in response to reflective coursework not only progressed the learning, but provided an opportunity for the teacher educator to identify evidence of learning and examine the processes that trigger learning. The responses from participants to the research based reflective questionnaire in Module 1 (Appendix A1), suggest the conceptualisation of effective pedagogy as determined by Timperley et al. (2007). In their wide ranging meta-analysis of professional development activities, pedagogy is defined as the activities and processes constructed to promote learning. Specifically, an activity must link theory to the teaching context and the process must consolidate prior knowledge, introduce new information and create dissonance and repositioning. In the responses, the participants made specific mention of their own teaching situations. They consolidated prior knowledge by

indicating their use of assessment strategies and providing detailed descriptions of their practice, for example one contribution read:

> Personally, in my own practice in the senior classroom, I used to put the curriculum objectives straight up on the board and discuss with the class what we were looking for. This was particularly useful in history in getting pupils to demonstrate the skills of synthesis and time and chronology when they could see that these were historian skills. (MT9; RC2b)

Dissonance and repositioning were also evident with one teacher realising that it is not enough to use talk-partners if the assessment information goes unheeded, "once the children have spoken with their partners or responded with the boards I have failed to pick up on what I see/hear and use it to modify my teaching or use it in feedback" (MT4; RC2b). Follow up tasks when the participants had resumed teaching asked participants to reflect on the impact of the professional development activity when they returned to the classroom. Allowing participants to reflect while working in the classroom environment prompted one participant to comment:

> Fortunately, my colleague and I both teach fourth class and work very closely together. I have shared the strategies I learned with her and she is also implementing them in her fourth class. We stream both classes for Maths and Literacy and so I think it is important that there is a consistency between both our methods of assessment. In addition, I intend to conduct further research into my practice of assessment and as the said colleague is also my critical friend, I am confident that our learning journeys will continue to be intertwined. I also intend on sharing my findings and any insights gained with all staff, later in the year. At that stage and with the support of management, I would be interested in reviewing our school assessment policy and making any amendments required to ensure best practice of assessment (both formative and summative) (M3; RQ3)

Reflective comments following professional development allowed the teacher educator to trace the learning trajectory and identify aspects of learning that may remain theoretical and speculative during the asynchronous activity. However, on return to the classroom reflection affords the teacher educator the opportunity to identify learning progression.

4.5.4 Reflection as a Learning Process: The Participant View

It is noteworthy however, that comments about reflective coursework were not particularly prominent in the responses to the second reflective questionnaire (Appendix C). This required participants to reflect upon their professional learning throughout the five modules of the course. When participants were asked to select which instructional approaches, they felt best supported their learning throughout the course, the majority of participants, forty-three out of forty-seven in total, indicated that video clips of assessment practices such a reading conferencing were the most helpful. However, when asked directly about the assignments, which were for the most part reflective in nature the overall response was that reflection did bring about learning as it "allows you to recap on the Module covered and express what you have learned" and "did prompt me to reflect on the course content in a way I probably would not have if I hadn't been doing assignments" (SC23; RQ2; q18)[38]. Other responses to this question included

> The assignments made me reflect on the whole module and I went back over my notes to do each assignment. It was a form of self-assessment! (SC13; RQ2; q18)

> The assignments helped me learn as I really had to dig into the information to try answer the questions efficiently. I found some of the assignments quite difficult and challenging to answer. (SC10; RQ2; q18)

> The assessments caused me to really study the material and read a lot around the course. (SC34; RQ2; q.18)

As a facilitator-researcher, the researcher noted that even though participants expressed a preference for videos to model practice in assessment, it was difficult for the course facilitator-researcher to assess the learning from viewing a video clip

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[38] RQ2; q18: Describe any way in which the assignments helped you learn.

without a reflective assignment. In a reflective assignment, the learner deliberately

thinks about past or forthcoming actions, with a view to implementing future

improvement (Hatton and Smith, 1995). Boud et al. (1985), believe that such

reflection can take place within a written reflective journal and should lead to new

understandings and appreciations. Such reflective journal contributions allowed the

researcher to gain insight into the learning of the participants. Commenting in a

reflective journal contribution (Task 5b), following a video on reading conferencing,

one participant said

> "I found the individual conferences, and the self-assessment
> board used as a follow up to these conferences as extremely
> interesting, and imagine that they would be hugely beneficial.
> However, I would seriously doubt the ability to incorporate this in
> an already packed timetable. I will try it with one or two pupils from
> September who I will choose based off last year's Micra-T results.
> It will be interesting to track the progress of these and try to see the
> effectiveness of such conferences, feedback, self-assessment etc."
> (SC29; RC5b)

The reflective contribution following the video allowed the researcher to

assess the level of learning that had taken place. This is a complex response as the

participant appears to be at the Personal Level of concern (Hall & Hord, 2006)

indicating uncertainty about whether the change is possible or even worthwhile. The

participant indicates that reading conferencing is interesting to track progress, which

may be of benefit to the teacher but does not indicate that it will be of benefit to the

students. Whereas other participants commented that "the conferencing really appeals

to me and I like how it was clearly displayed and easily understood and used by all

involved" and "the idea of the teacher pupil conference was also fantastic. I liked the

way the pupil could identify using the colour coded posters how where they were

excelling and struggling with their reading" (SC10; 5b) …. "I am feeling very

inspired by witnessing the implementation of this Writing Conference. I am

considering ways in which it could be implemented in the Junior Infant classroom

(MT1; 3b). Another example of a response to the use of modelling through video demonstration as pedagogy included

> "I thought the idea used in the self-assessment demonstration video was fantastic. It consolidated the reading conference and allowed the teacher and pupils to see where they were in their learning and where to go next. It also highlighted the reading strategies so that the children could understand what they were and how to improve their learning." (SC6; 5b)

These contributions indicated a higher level of concern (Hall & Hord, 2006), where the consequence for the student was considered important. It can be argued, that the data indicated that the participants found the video clips of practice an enjoyable way of learning and effective method of modeling practice and a way of linking course material to their own teaching context. However, there is no opportunity for the facilitator-researcher to assess the level of learning or for the participant to articulate new learning, without a reflective contribution. It is also difficult to consider video clips without follow up reflection, as pedagogy. The facilitator-researcher is unable to establish whether new information has been presented, prior information has been consolidated or whether there has been any dissonance or repositioning by the teacher (Timperley et al., 2007).

4.5.5 Centrality of Purpose for Reflection

Nevertheless, there was a sense among participants that not all reflective tasks in the asynchronous setting were equally beneficial. Issues relating to the unnecessary nature of the reflective tasks that formed part of the DES evaluation were prominent in the data. This reflective exercise was imposed externally upon course providers as a condition of completion for participants. It was not set by the course facilitator-researcher and did not connect directly to any particular learning activity or assessment topic. The participants were asked to make an "overall reflective comment". One participant stated that

"this sheet itself is tedious. I really don't see the benefit of copying and pasting forum contributions. I am aware that we are required to keep a record of Learning. I have created a folder with readings, PowerPoints and links from this course so that I can refer to it in the future" (SC17; LR)[39]

Echoing this sentiment, another participant complained that "I also don't think we should have to put our responses on this form as they are already on the loop[40] page" (SC19; DES). It can be argued that this type of reflective task has no clear purpose other than accountability does not appear to be valued by the participants. Moon (1999), has argued that reflective writing becomes meaningless unless the purpose is valued by the writer. Elaborating upon this Cowan (2014) commented that quality reflection also depends upon the prompts given to the writer. Previous reflective writing tasks contained specific prompts (Appendix E), provided by the course facilitator-researcher-influenced by the findings of the work of Cowan (2014). We also know that reflection that is "cut-off" as can happen in a time bounded synchronous learning setting hampers learning (Gorman, 2017).

Taken together, the data from this section would seem to indicate that reflective tasks if properly structured with a clear purpose other than accountability alone support both participant learning and facilitator-researcher insight into the learning taking place. Even though the accountability task was less challenging it was not seen as useful or necessary or promoting learning by the participants. This may seem to contradict the findings of Darabi et al (2013), who commented that learners favoured less complex strategies. It would seem that purpose and structured prompts support learning and the perception of enjoyment or easiness by the participant is not

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[39] DES Learning Record required to be completed by all participants in Summer Course professional development activities. Participants are required to make "an overall reflective comment" on their learning. (LR)
[40] LOOP is the interactive online learning platform used to support the professional development activity

an indicator of learning. Such a perception may enhance the learning experience of the participant, but without the more complex task of reflective engagement, learning is compromised. Reflective tasks deepen engagement with course material and encourage participants to relate new learning to their own professional circumstances. However, the facilitator-researcher must be in a position to assess the contributions made by participants in order to identify learning. Several frameworks are available to facilitate this task. The contributions made by course participants during the modules provided evidence of learning, but only if cognitive presence (Garrison & Arbaugh, 2007), was strong.

4.6 The Interactive Asynchronous Online Learning Environment: Impact on Teacher Learning

The second research question focused on the area of online learning and in particular the effect if any, the interactive asynchronous online environment had on teacher learning during professional development. The literature indicates that the ability of the instructor to facilitate critical thinking is a key factor in quality online learning (Reushle & Mitchell, 2009; Means et al., 2010). It has also been argued that the actions and input of the facilitator rather than the technology or media result in learning (Means et al., 2010; Freidhoff, 2008; Bernard, 2004). It is however, more accurate to claim that the operationalisation of the facilitator's technology, pedagogy and content knowledge (TPCK, Thompson & Mischa, 2007) is the key factor. Indeed, the literature indicates that knowledge of the features and affordances of technology (Kemp & Giskin, 2014; Woodward & Machado, 2017; Elliot, 2017; Holmes et al 2010) are crucial to bringing about learning along with active evaluation of the technology available (Freidhoff, 2008). In addition, social presence, teaching presence and cognitive presence are key features of online learning settings that form the

community of inquiry (CoI) necessary for learning (Garrison and Akyol, 2013, Garrison and Arbaugh, 2007). Nonetheless, the literature falls short in explicit description of the processes required in the asynchronous online environment apart from some specific pre-conditions to ensure learning. These included, student-to-student interaction (Northey et al., 2015), discussion and critical thinking (Coppola et al., 2002), and prior experience of the teacher educator of teaching in an asynchronous online environment (Adnan & Boz, 2015). The following section explores the pedagogical processes that promote cognitive presence and offer a critical interpretation of teaching presence. Exploring assumptions about assessment and participation in a community are also discussed.

4.6.1 Cognitive Presence in the Asynchronous Setting

Cognitive presence is the level to which course participants in online asynchronous settings can contribute meaningfully to tasks and discussions and develop their own learning. To bring about teacher learning in assessment the data seems to suggest that cognitive presence is a requirement. Garrison & Arbaugh (2007), in their work on online learning, define cognitive presence as the "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse" (p. 161). The authors state that cognitive presence has four key phases: a triggering event (a concern is identified for inquiry), exploration (exploring the topic through discussion and critical reflection), integration (constructing meaning from the thinking developed through exploration), and resolution (applying new knowledge into a real-world setting).

Lack of cognitive presence was evident as the contributions of participants to a forum (Task 1b), consisted of unreflective, descriptive responses, documenting existing practice. Responses consisted of descriptions of practice as explained in an

expert podcast about questioning in the classroom as an effective assessment technique.

> Dr. Doyle (pseudonym) suggests that rather than traditional teacher asks a question, child answers, teacher asks a question, child answer.... that in our classrooms we should pose a question to the class and get the children to pair up. In their pairs the children should then discuss the question and try to come up with a suitable answer or answers. The teacher then picks a child randomly so that each child is prepared and has an answer in mind. (SC12; T1b)

> James discusses the idea of "ping-pong" questioning. He suggests that talk partners are a more productive tool to use during questioning particularly higher order questioning, and open-ended questioning. He states that quality questioning can be integrated seamlessly into AfL strategies allowing teachers to build on responses. (SC2; T1b)

The participants described practice as recommended by an expert but have not related the podcast content to their own classroom use of questioning or offered any critique. This finding would seem to support the work of Baran et al (2011), indicating that a barrier to reflection and by extension cognitive presence was the repetition of class material. This in part is due to the nature of the prompt offered in the assignment which did not direct the participant to explore the knowledge or apply it to a real-world setting. Prompts which do not break down each component required to promote cognitive presence, elicit descriptive and non-critical contributions.

Even though knowledge of the strategy is demonstrated an action has taken place namely listening and writing, it cannot be equated to quality teacher learning. As alluded to previously, participants implied that podcasts and other visual media help them learn. Participants said "I found the podcast by Dr. Doyle in the first module to be very informative and useful. I liked how he explained assessment in clear terms" (SC23; RQ2; q1)[41] and "during this course I felt that I learned best through the podcasts and videos". (SC13; RQ2; q1) However, the facilitator-

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[41] RQ2; q1: Describe how you learned best during this course.

researcher noted the lack of cognitive presence in the responses to the podcast; the participant had not been directed explicitly to compare the content of the podcast to their own professional context or explore the material in depth. The responses provided were influenced by the quality of the prompts provided by the facilitator-researcher. However, cognitive presence was more evident in the responses provided by participants to the professional readings.

Each of the two groups of participants was given a research based academic article on formative assessment to read. A very direct prompt was given by the facilitator-researcher which read "When you read this article identify area in your practice that reflect the ideas in Black et al. (2004) What would you change and why after reading this article?" (SC1; RC2a). Even though the podcast and the professional reading both focused on the use of questioning as a classroom assessment strategy, cognitive presence was much more evident in the responses to the professional reading. The participants related the reading to practice and examined their own way of questioning. One quote reflected the overall contributions:

> One of the points that struck me in the article was that research showed that teachers tend to wait less than a second for the child to respond, they will change the question or answer the question for the child. I have definitely been guilty of this in the past with questioning. I did implement a point system in the classroom for participation and class discussion to encourage the class to answer questions and give feedback. I feel this helped a bit with my questioning strategies as it forced me to be a little more patient as I wanted to give the child a point for discussion and participation and the child also wanted to gain the point. (SC15; RC2a)

Another response indicated that the article and the prompt made the participant think about their own approach to questioning:

> From reading this article it has made me aware that I must work on my questioning. I tend to ask questions and jump straight in if I find that they are having difficulty in answering the question. I like the wait time and no hands idea and will definitely implement these in my classroom in September. (SC36; RC2a)

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The data from these participants suggested that bringing about cognitive presence requires very specific input from the facilitator-researcher, reflecting strongly the findings of Garrison et al. (2010), who concluded that teaching presence is key in bringing about cognitive presence. The concept of teaching presence has been defined as activities that guide the learning (Sheridan & Kelly, 2010). However, the components of teaching presence as provided by Sheridan & Kelly (2010), do not provide enough focus upon the actual tasks to bring about learning. They argue indicators of teaching presence include responding in a timely manner to queries, making course requirements clear, participating in discussions, providing feedback, being empathetic and being friendly.

However, this data suggested that effective teaching presence needs to be broadened to include the specific attribute of relating the course material to the practice of the teacher by prompting the participant to explore their current classroom practice in assessment and identifying and planning for change in the future. These results are consistent with the findings of the meta-analysis of Means et al. (2010), who concluded that instructor led guiding tasks that facilitated reflection led to cognitive presence which in turn improved learning outcomes for asynchronous online learners. They also concluded that promoting student engagement had no positive influence on participant learning. Perhaps promoting student engagement may enhance student experience but it cannot be said to lead to teacher learning. It can be argued that Sheridan & Kelly's (2010), conceptualisation of teaching presence is more akin to promoting student engagement than inciting reflection and that an additional presence should be defined in terms of the ability to provide skilled reflective prompts to participants, a reflective presence.

4.6.2 Insight into Practice: Exploring Assumptions

As Opfer & Pedder (2011), have claimed, professional development will not result in learning, if the individual teacher traits are not taken into consideration. Part of a teacher's individual traits, it can be argued, are made up of the assumptions held by a teacher about assessment. Indeed, Hammernass et al. (2005), believe that an integral part of professional development involves developing teacher dispositions which include the habits of thinking and action regarding children and teaching. Similarly, Xu & Brown (2016), identify teacher conceptions of assessment, views of cognitive and affective dimensions, and beliefs about learning theory as significant influences on the assessment capacity of the teacher. Developing dispositions about assessment therefore involves exploring existing thinking and actions regarding assessment.

Exploring assumptions is also a key part of teacher education (Loughran, 2006) and assessment education (Xu & Browne, 2015). The asynchronous online setting impacted upon this process. The researcher fieldnotes (FN15[th] July), noted the efficacy of individual email to students from the facilitator-researcher to explore and clarify assumptions. The reflective data offered understanding about assumptions held by participants about assessment. The contributions made by participants during the discussion forum often revealed assumptions about assessment and allowed the facilitator-researcher to probe and develop participant learning. When asked to comment on the role of standardised testing a participant observed in an online forum post "I do feel the Micra-T can give a fairly accurate reflection of a child's ability …. I often doubt the validity of results" (SC; LR;). The facilitator-researcher was then able to respond to the forum post by individual email clarifying the idea that a standardised reading attainment test is not measuring ability but attainment in reading. The issues

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of reliability and validity were also clarified. Individual emails allowed the facilitator-researcher to probe and challenge assumptions that were evident in practice. One participant said that, in her school, assessments are used to allow students "showcase" what they know. Assessment needs to be more than showcasing; it has to be used to plan for teaching. The facilitator-researcher responded:

> In your journal entry, you say that "assessments we use with our pupils should allow them to showcase what they know in a style that suits them". Assessment is more than just showing what you know. It has to help the teacher and student plan for the next stage of learning. (E; MT2)

Another assumption highlighted by the asynchronous online forum contributions was the idea that only mainstream class teachers could carry out formative assessment. Teaching English as an additional language (EAL) was not viewed as a valid setting for implementing formative assessment. Even though the participant cited a very clear example of formative assessment through the use of data to plan for teaching and learning, formative assessment was only seen as specific strategies like traffic lights.

> "As an EAL teacher, I have been primarily concerned with the administration of the Primary School Assessment Kit (PSAK). This summative assessment documents the English language proficiency of pupils. I used the results to inform my planning, determine withdrawal groups and determine in-class intervention content. I would also use oral questioning and observation during EAL lessons to assess for learning, however, I found it difficult to implement a traffic light system with pupils who did not understand anything that I was saying. This made it more difficult to assess!" (MT1; RQ1; q6)[42]

The same assumption was put forward by another participant in a follow-up questionnaire on practice following the professional development activity.

> I have had little opportunity so far, this year to implement many of the approaches as I am teaching in language support with infants

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[42] How have you learned about classroom assessment up to now?

> with little to no English. Many of the answers below reflect this fact
> – I am certain that if I were in a mainstream class or LSRT that it
> would have a much greater impact. (MT9; RQ3)

Once again, such a post allowed for a prompt and further exploration of the EAL classroom as a setting for formative assessment. Even though the facilitator-researcher could recognise and challenge assumptions, as they were identified, the evidence suggested that the facilitator-researcher did not explicitly set out to elicit and examine assumptions in the asynchronous online setting.

In order to develop assessment capacity and drawing on the work of Box et al. (2015), identifying the contextual factors that both facilitate and prevent assessment are an important part of the process. This can be extended to thinking about assessment by the participant. A synchronous discussion forum, using the chat feature on the learning platform, was organised by the facilitator-researcher to raise some of the assumptions identified. However, it was very difficult to obtain student engagement as contributing to the chat feature was not a compulsory element of the course. Participation was not required by teachers for progression or completion purposes. Of the two students who did log-on for the scheduled synchronous discussion, one student wanted to ask questions about assignments and the other wanted to resolve a technical issue. Little if any change was brought about in the assumptions of participants. The facilitator-researcher has perhaps failed to take enough cognisance of the difficulty of engaging participants in non-compulsory, responsive discussion opportunities in the asynchronous setting no matter how well planned or how strong the rationale. However, in the initial face-to-face session with the MTP group, assumptions were much easier to challenge.

As a facilitator-researcher, the challenges to assumptions that did not align with assessment theory were reactive and unplanned but a well-established part of the researcher's practice. One participant suggested that AfL was only really suited to

infants as pupils soon got fed up of traffic lights as they got older. As facilitator-researcher, it was then possible to allow other students to join in the discussion.

The data from this section would suggest that exploring assumptions is viewed by the facilitator-researcher as important but was not planned for explicitly and proved difficult to operationalise in an asynchronous online setting. In a face-to-face setting, it was more intuitive and responsive but should have been more planned. Even though the facilitator-researcher did respond and challenge any assumptions that were not in alignment with research and theory about assessment, the facilitator-researcher did not include explicit tasks to elicit and challenge assumptions about assessment. This type of behaviour by the facilitator-researcher would seem to support the work of Korthagen (2010), indicating with preservice teachers there is a need to progress from unconscious and triggered behaviours to planned conscious set of behaviours. This progression of learning from the unconscious automatic gestalt to the conscious cognitive schema is important it can be argued for the teacher educator in order to develop deeper professional learning for the teacher participants.

4.6.3 Participation in a Community

The concept of community features widely in the literature on teacher learning but little reference is made to the standing of community in the asynchronous professional development setting. The literature suggests that participation in a community promotes professional learning (Smith, 2015; Hargreaves, 2013; Schneider & Randel, 2010; Timperley et al., 2007; Bernard, 2004; Hammernass et al., 2005; Garrison et al., 2000). However, Timperley et al., (2007), focus on the necessity of a common purpose in a community in any professional development activity. They also alluded to the idea that a common purpose can limit development and lead to retention of the status quo. This could be interpreted as consensus rather than

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discussion and critical evaluation to establish a purpose. Teacher learning also occurs through classroom experience (Loughran, 2006; Korthagen, 2010; Berry, 2009; Stiggins, 2010). Hammernass, et al., (2005), argue new teachers learn to teach in a community that enables them to develop a vision for their practice and a set of understandings about teaching, learning and children; they also develop dispositions about how to use the knowledge and practices that allow them to act on their intentions and beliefs along with tools that support their efforts.

Bernard (2004), and Garrison et al. (2000), focus on the nature of the interaction in the community, particularly in an online synchronous context. Means (2010), emphasises the role of individual reflection and engagement in promoting professional learning and has criticised the emphasis on community in online settings. In the asynchronous setting the use of technologies such as video (Woodward & Machado, 2017), online forums (Kemp & Giskin, 204; Freidhoff, 2008), and email (Elliot, 2017), promote individual reflection. Becoming a member of a community of practice without reflection does not lead to quality learning and teachers become socialised into existing practice rather than making critically evaluated decisions about existing practice.

The data from this study suggested that the community attribute of asynchronous online professional development has two manifestations. One is connected to individual participants reflecting upon their own community of practice as assessors. The second manifestation of community is establishing a common purpose among the participants during the asynchronous online professional development. Contributions to the assessment journals (RC1c), revealed the dominance of standardised test data as an indicator of learning in schools. The data from Module 5, as reported by the participants confirmed the tensions experience by

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teachers resulting from colleague and parental views that standardised test data is the most valued source of assessment data. The researcher noted the emergence of a common purpose of the individual teacher needing to learn how to negotiate their own contexts regarding testing (5b). A similar identification of a common purpose was observed during the face-to-face session of the MTP cohort. The structure of the community allowed participants to identify the features of their assessment procedures, assessment context and reflect upon their own community of practice in their school setting and in turn plan for assessment.

Developing a vision for practice was also clear in Module 3 through in participant interaction in the discussion forum about assessing writing (5b). Following the modelling of conferencing as an assessment method, eight SC participants showed that while they agreed with the method, they would be unable to use it because of time constraints and large numbers. However, two participants indicated that modifying the method to assess writing in the video, to use in a group setting or as a peer-assessment framework would be feasible. The community of practice facilitated discussion and creation of vision for practice. During the forum in Module 4 (4b) there was evidence of community with a common purpose around the need to learn to assess oral language and the development of a vision for practice. Twenty-six of the SC participants and all of the MTP participants expressed the idea that assessing oral language was important and referred to course materials such as Drumcondra Oral Language Indicators (Murphy& Shiel, 2000), PDST Oral Language Manual and The Primary Language Curriculum as new tools to facilitate the assessment of oral language. A similar dynamic was also evident in the forum for Module 5. Individual learning was visible and reflects Means et al. (2010), idea that individual reflection is the driver of learning not the actual community, as was evident is this study.

4.6.4 Facilitator-Researcher Feedback

In response to the question asking participants to indicate the instructional approaches that helped them learn in the asynchronous setting, only eight participants of the forty-seven responded that they thought written facilitator-researcher feedback supported their learning when asked to choose from a list. However, when the same question was asked without suggestions, none of the participants referred to facilitator-researcher feedback as supporting learning in an asynchronous setting. The participants seemed to view the writing itself as the learning activity and that the writing was for themselves as teachers rather than to be the subject of feedback. All contributions to each of the seventeen written tasks were read by the facilitator-researcher, but feedback was only provided when there was evidence of misconception, lack of engagement with course material or failure to respond to a particular aspect of a question. Feedback was provided by individual email contact between the facilitator-researcher and the participant. This proved effective in the asynchronous setting, as the nature of this course did not allow for individual responses to all items posted and the external inspector commented that "responses to learner queries, submissions and participation are prompt and relevant". Facilitator-researcher fieldnotes also identified the effectiveness of individual email and the change of tone in communication between task contributions and individual participant email replies. Much of the writing during the professional development was prompted by reflective questions or email responses initiated by the facilitator-researcher. Even though writing was required, participants viewed the writing as reflection.

This section has examined the teacher learning with particular emphasis on the asynchronous learning environment and how it relates to teacher learning. Ensuring

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cognitive presence is imperative during asynchronous professional development.

Cognitive presence is established through the reflective presence of the facilitator-researcher, not just teaching presence or social presence, which may provide a pleasant experience for the asynchronous participant but does not lead to learning. The asynchronous setting also requires judicious planning for exploration of assumptions about assessment. The responsive process of challenging assumptions is easier to implement in a face-to-face setting or even a synchronous online setting; this is not possible in the asynchronous setting and the onus is on the facilitator-researcher to purposefully initiate exploration. Individual email proved very effective to respond to and challenge assumptions however, a more structured approach is required. The role of community in the asynchronous setting centred on the ability of the teacher to reflect on involvement in their own community of practice as assessors.

4.7 An Agentic Response to Asynchronous Professional Development

Hall (2008), views agency as the facility that enables choice around adopting new identities which are in turn enacted by participating in a social community or community of practice. Buchanan (2015), argues ideological positions form part of teacher identity and subsequently dictate how teachers react to policy and culture. It can be argued that ideological positions influence agency and whether teachers adopt changed identities. Laskey (2005), identified resistance to change based on ideological reasoning as agency.

Loughran (2007), contends that without agency, teacher education and teacher learning become reduced to a superficial process of transmitting information and absorbing facts. Responsibility by the teacher for their own practice and strong self-evaluation of practice by a teacher are considered the key elements of teacher agency (Edwards, 2015). However, Robinson (2012), also alludes to the attribute of making

the choice to maintain routines, and not bring about change, and describes agency as "internalising choices, analysing and reflecting based on past experiences and future trajectories" (p.233). This section deals with aspects of asynchronous professional development that facilitate agency. Conditions that allow teachers exercise agency in assessment are discussed. Finally, elements constraining teacher agency as an assessor are also examined.

4.7.1 A Facilitating Agency: Change in Teacher Beliefs about Assessment.

When asked about change in beliefs following the professional development activity, (RQ2), participants indicated that their beliefs about assessment were either affirmed because of prior learning in ITE or professional development or changes had occurred in how they viewed assessment in the classroom. A summary of the change in beliefs as specified by participants is provided in Fig. 4.14. The main changes occurred in the participants' views of assessment and a change in skill level. Twenty participants indicated that following the professional development activity they realised that their view of assessment to date had been limited. Thirteen participants said that their skill in using classroom assessment had developed as a result of the professional development. Affirmation of current beliefs was reported by six participants.
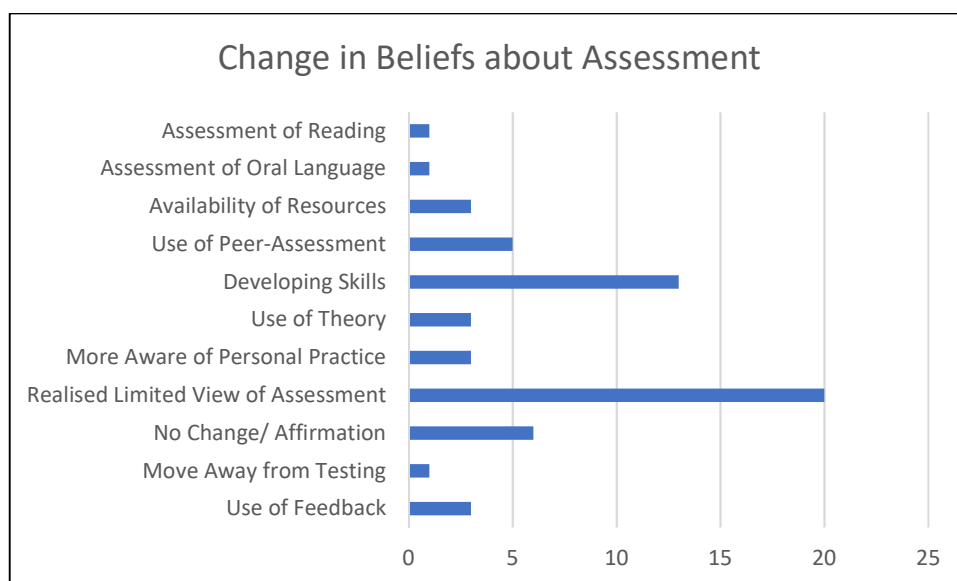
Figure 4.14 Change in Beliefs about Assessment

Taking account of the model of teacher agency developed by Biesta et al (2015), a change in beliefs develops teacher agency by enhancing the cultural and material capitals available to the teacher to strengthen decision making in assessment and develop teacher assessment identity. However, when asked if there were any barriers or constraints to implementing new learning in the classroom, factors were cited by participants that may indeed prevent teachers from acting on beliefs, exercising agency and entering the community of practice. Barriers or constraints to agency that result in participants not adopting new identities are presented in Fig. 4.15.
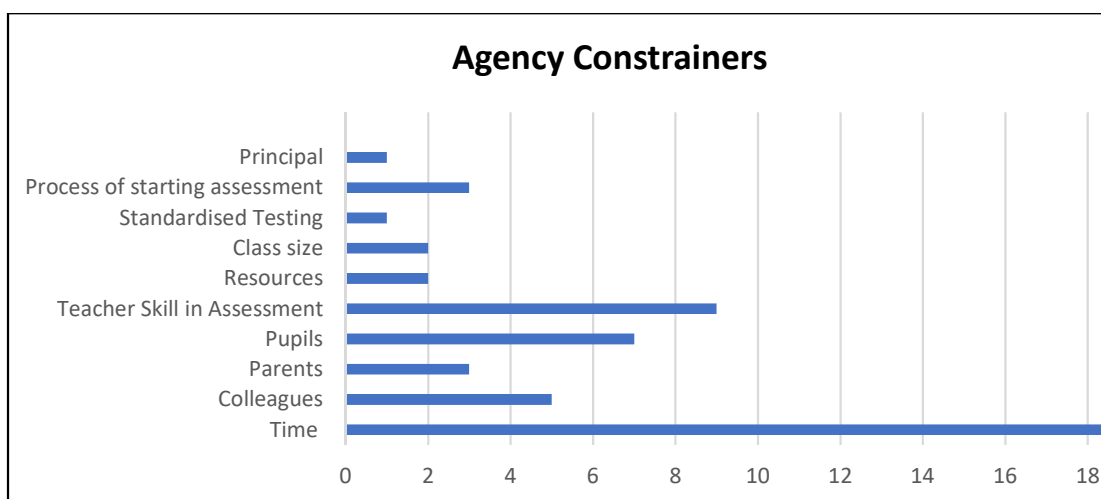
Figure 4.15 Factors Constraining Teacher Agency in Assessment

It is interesting to note that many of the barriers (Biesta et al., 2015), form part of the working environment of the teacher and are not ideological. Time was identified (n=19) as a barrier to implementing new learning and in turn affected the choices made by teachers. The teacher's skill level (n=9), pupils (n=7) and colleagues (n=5) were also identified as factors that would constrain a teacher's agency. Field notes from the researcher (FN, 30th August) and external inspection data (Appendix M) both indicate the need to focus upon strategies to help teachers visualise change in assessment practice, taking account of time with the external evaluation report stating, "Greater priority should be given to the development of participants' practical classroom management steps" (Appendix M). It is noteworthy that the constraints identified by teachers to implementing new learning were not ideological, and did not cause resistance to using new learning.

4.7.2 Exercising Agency: A Shift in Assessment Identity

Through influencing the assessment practice of colleagues and demonstrating confidence in assessment, participants showed a shift in identity around assessment on return to the classroom following asynchronous professional development. Data from the third reflective questionnaire (Appendix D), indicated increased confidence in

talking with colleagues and prospective employers about assessment, with one teacher

saying that the course "has given me more confidence when talking about assessment

with other teachers" (SC35; RQ3). Change of practice was also identified when

teacher described how she introduced change in her school saying:

> I met with my colleagues in both Junior and Senior Infants in early
> September. We all have WALT and WILF displayed in our classrooms
> and have agreed to make a conscious effort to share the learning
> intention and try lollipop sticks as a way for children to answer
> questions. I distributed the AfL checklist and AfL strategies to each of
> them and we have agreed to meet again at the midterm to discuss how
> we are getting on. I am insistent on a small step approach! (MT4; RQ3)

The same scenario of the teacher taking initiative and demonstrating agency in the

attempt to influence practice, be responsible for the use of new learning and influence

teacher identity around assessment was evident when a participant commented:

> As a school, by sharing the information I received from my Summer
> course, many teachers have become more open to continuing their
> professional development in the area of assessment and use it on a more
> effective and on a daily basis in the classroom. (MT7; RQ3)

This section has examined teacher agency and its role in the response teachers

exhibit to asynchronous professional development. The data here suggested that a

shift in belief occurred through asynchronous professional development and brought

about change in classroom practice. Participants have indeed cited constraints to

exercising agency however, without follow-up data it is difficult to know whether the

shift in belief has been acted upon.

4.7.3 Constraining Agency: Exploring Influences

Complexity theory promotes the assumption that teacher learning is influenced

by the context in which the teacher operates (Opfer & Pedder, 2011). It is also evident

from the model of developing learning about assessment (Box et al., 2015), internally

and externally constructed contextual factors influence teacher assessment literacy

development. A significant theme that emerged from the first reflective questionnaire

(RQ1) data was the influences exerted on teachers about assessment in their own school settings from their colleagues and the parent body. The literature indicates contextual factors influence practice in assessment (Fulmer et al., 2015; Xu & Browne, 2016; Apple, 2011; Clarke & Hollingsworth, 2002). Participant responses to questions[43] about the significance of assessment information showed a difference in the importance attached to standardised test data as a source of assessment information between parents, colleagues and participating teachers. The asynchronous online professional development activity provided participants with a lens through which to examine these influences. In the earlier section, parental expectation of assessment was not mentioned to the same degree as a factor affecting teacher assessment practices. Figure 4.16 summarises the data and demonstrates the difference of opinion held by parents, colleagues and participant teachers. These beliefs from part of the context in which teachers operate as assessors and may indeed impact upon teacher agency and identity.

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[43] RQ1; q 67: What Assessment information is considered the most important by parents with 1 being the most important to 6 being the least important? Portfolios, Portfolios with Feedback, Teacher Designed Test, Formative Assessment Information from Peer- and Self-Assessment; Work Samples. Q. 68 What assessment information is considered important by your colleagues?

Importance Of Standardised Test Data as Source of Assessment Information

Legend: SDT not most important (orange), STD Most Important (blue)

Values: Parents — 11 (SDT not most important), 36 (STD Most Important); Colleagues — 12, 35; Participants — 42, 5
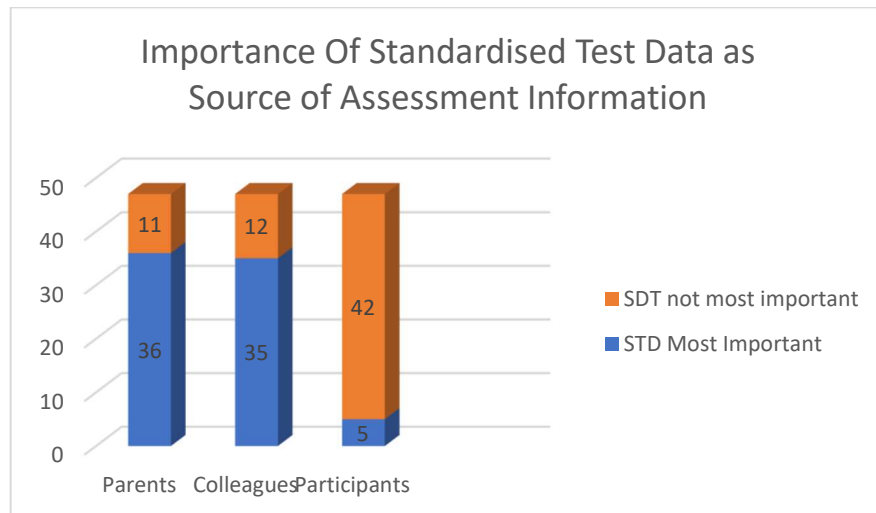
Figure 4.16 Standardised Test Data as a Source of Assessment Information

Thirty-six participants indicated that parents regarded standardised test data as the most important source of assessment data. In addition, thirty-five participants indicated that their colleagues regarded standardised test scores as the most important assessment information. One participant whose response was not typical did say:

> My colleagues are very forward-thinking and appreciate the value of formative assessment. Portfolios are used in almost every classroom and prove very effective in every class level. We are always encouraged to have the portfolio ready for parent-teacher meetings along with work samples from the beginning of the year to compare with up-to-date work samples illustrating progress made. Standardised testing is deemed important but is not to be dwelled upon, particularly with parents. If anything, we are encouraged to 'play down' the results and focus more on the in-class continuum of assessment for learning which takes place on a day to day basis. (MT10; RQ1; q68)

From this contribution, the participant demonstrates awareness that the school context in which she operates may be not representative of schools generally. She regards her setting as "forward-thinking" because formative assessment is understood and valued and standardised test results are not perceived as the most important source of assessment information. These features of the working context can be identified as "enablers" (Emirbayer & Mische, 1998), for the teacher wishing to develop strong assessment literacy and identity in assessment. It was interesting to note that when

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the participants themselves were asked to consider what they regarded as an important source of assessment information, only five participants indicated that they thought standardised test data was the most important source. It was notable that none of the participants in the MTP cohort indicated that standardised testing was the key source of assessment information, but nonetheless participants in the MTP cohort and SC cohort did express uncertainty as to the alternatives and indicated that the professional development activity had improved their knowledge and skill in assessment and their confidence in reporting assessment information from sources other than standardised tests. One MTP participant wrote "I always thought assessment was important, but I understand now how meaningful it can be. I was particularly struck by the peer assessment in writing. The resources provided were interesting and worthwhile". (MT11; RQ2; q8)[44]

Writing a journal contribution during Module 1(RC1c), which required participants to comment on standardised testing in the context of assessment, proved a useful source of data for the course facilitator-researcher and participant. The contributions provided insight into the practices in assessment and testing that teachers have acquired from their professional context as teachers. It allowed the facilitator-researcher and participant, examine the influences on teacher assessment practices, discuss assessment identity in the teacher, as opposed to just learning about new ways of carrying out assessment. One participant described the professional context in which assessment exists:

> I do believe that there is an over reliance on standardized testing and
> different forms of this type of testing. In my school, many teachers are
> very concerned about the scores that the children in their class receive
> in these tests and as a result many spend their time teaching to the test.
> There is very little alternative methods of assessment used to test the

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[44] RQ2; q8: Have your beliefs or thinking about assessment approaches changed after this course? If so describe what activity, task or resource resulted in this change?

children in our school and very few teachers appear to be doing AFL strategies in their classrooms. Parents also seem to focus mainly on the results of standardised tests. I have had parents coming into me in the past almost crying if their child has dropped a sten score or if they are not in the top percentile for their age or class. I feel it is up to us as teachers to change this way of thinking and stop relying on these scores as much. (SC13; LR;)

Such a contribution, reflects in some way the ideas put forward by McGee & Colby, (2014); De Luca et al., (2014), Lingard (2010) and Box et al. (2015) that individual teacher and school assessment practice is influenced by structures such as government policy which emphasises test results as the preeminent approach to assessing student learning. This government policy in turn influences the participants' colleagues and parent cohort. Such dominance in this instance, could also be attributed to underdeveloped assessment skill and unexplored assessment identities by teachers. As a result, teachers as assessors find themselves unable to provide any alternative assessment information to standardised testing. Teachers are unable even indeed, to see the value of standardised test data to influence instruction. Dominance of standardised testing as an assessment strategy occurs when the approach to assessment is endurance rather than proactive participation to seek alternatives. Hickey's (2015), thinking on a participatory approach to assessment is important as schools are encouraged to establish a clear and articulated link between the assessment data and its actual usefulness in helping individual student progress as opposed to carrying out assessment because they are mandated. Perhaps the knowledge of assessment is present, to establish this participatory approach to assessment. However, the school culture and practices are perhaps restricting agency, identity development and therefore lack provision of credible assessment alternatives. It was clear from the data that when participants were provided with an instrument to audit their own practice, participants did have knowledge of alternative assessment practices, but this did not translate to action in the school setting because of the

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dominant discourse preventing the development of alternatives within the school culture.

The effect of parent conceptualisation of assessment on teachers' thinking and practice in assessment was also evident. Stiggins (2010), has argued that parents and the public have been persuaded through the media that standardised testing is the only credible source of assessment data on a child's learning. However, schools may also be responsible for perpetuating the dominance by failing to provide any information to parents about other sources of assessment data or other approaches to assessment suited to classroom use. The influence of the mandated standardised testing policy in Ireland (DES, 2012), was recognised by participants in this study who believed that the power to counteract such influence lies with the teacher. Although this is tentative the participants revealed motivation and desire to learn about new ways of assessment to offset the current policy influences of mandatory standardised testing and explore alternatives. Another participant described their assessment context and echoed the previous contribution describing the dominance of standardised testing, however, the use is a little more nuanced with the data being used to identify underachievement, but no alternative is mentioned:

> We do heavily rely on Standardised Test Results. The reason for this is perhaps because the Standardised tests provide us with results to report back to parents. We can compare the standard score to the child's N.R.I.T. result and the parents can clearly see how the child is performing in relation to their ability. (SC14; LR)

Nonetheless, it seems that this participant sees being able to report something to parents as the significant function of standardised testing.

On the initial evaluation of practice survey, respondents were asked what assessment information is considered most important by parents. Each participant from both the MTP and SC groups indicated that standardised test results were

considered the most important assessment information by parents. This was followed by teacher designed tests and work samples. Portfolios and formative assessment information was considered of least importance by parents. It is also noteworthy, that standardised test data was also considered as the most important source of assessment data by the majority of the participants' teaching colleagues in the opinion of the participants stating that "Most of my colleagues would regard standardized tests and teacher designed tasks and tests as more important than self & peer assessment" (MT1: RQ1; q68). Similar influences are identified by other participants "My school culture values standardised test results as the main validation for teaching and learning and little consideration is afforded to variables affecting scores or indeed, other assessment methods" (MT2; RQ1; q68) "Standardised test scores only. Particularly when you are in a hand over meeting. I find that my colleagues are only concerned with who the low achieving children are and what supports they had" (MT6; RQ1; q68) and "The emphasis is definitely on summative assessment and standardised scores. There is usually a slot allocated at a staff meeting, towards the end of the year to discuss the results of the Drumcondras, but there is no action taken, except to identify children for learning support" (MT9; RQ1; q68).

Notwithstanding, the stated dominance of standardised testing as form of assessment, participant teachers demonstrated knowledge of the limitations of such an approach and the belief that parents need help understand the difference between AfL and AoL for any change to occur. One participant observed that "parents still want the STEN and unless this changes overall they will not be concerned with anything else" (MTM5Q). A similar view is expressed by another participant who notes that:

> most parents view Assessment of Learning as very important and
> perhaps are not as aware of Assessment for Learning. They are too
> caught up in the finished product and where their child is at and
> perhaps, could be enlightened to the value of Assessment for

Learning and to focus on where their child is at and where they are going. (SC14; RQ2; q10)[45]

As before, parental beliefs around assessment are influencing teacher practice, but the data would seem to indicate teacher awareness of the need to bring about change and counteract the beliefs held by parents. However, the dominance of standardised testing was also cited as a barrier to bringing about change with one participant observing "it's hard to get people to change their practice and in a culture where standardised tests have such an influence, it's hard to convert other teachers into focusing on AfL" (MT5; RQ2, q6).[46]

The contributions made by participants as part of course requirements revealed a discourse around assessment and the importance attached to standardised test data as a source of assessment information. The discourse centred on the importance attributed to standardised test data by teachers themselves, parents and colleagues. The dominance of the importance attributed to standardised testing as a source assessment information by parents and colleagues of participants was evident from the data gathered from online discussion fora and questionnaires.

According to the data from this section beliefs about standardised testing held by parents of students and colleagues of participants influence practice in assessment and form part of the complex multilevel environment inhabited by teachers as they learn. However, the data also indicate an awareness on the part of participant teachers that these teachers themselves have a role in bringing about a change in attitude and practice that will encourage others to view standardised testing as a component of assessment rather than the only form of valued assessment. The change environment,

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[45] RQ2; q10: Do you think anything on this course could have any impact on how parents view assessment?

[46] RQ2; q10: What challenges if any do you anticipate in implementing any new learning from this course?

that is the school community, reflects the complexity of a teacher's professional

context. Activities during asynchronous professional development encourage

participants to describe the context for assessment in which they operate. These

activities provide a structure in which to identify the influences exerted upon teachers

and reflect upon the relationship types that form part of the context. Only with a clear

insight into the influences exerted in their context, can teachers begin to put in place a

change process to shift the assessment responses to existing beliefs and practices.

4.8 Impact of Participant Profile on Learning.

Two aspects of the demographic data collected on the first reflective

questionnaire (Appendix A1), were notable when examining the participant

contributions. These were the number of years teaching experience of the participant

and the participant opinion of how prepared they were for classroom practice in

assessment following ITE. These were unexpected findings.

Despite the range of teaching experience, participant contributions contained

evidence of the need to learn about assessment from both the less experienced and

more experienced[47] teachers (n=15) each indicated

areas in which they planned to improve practice on returning to the classroom. One

SC participant with more than twenty years of experience stated that:

> During my teaching Assessment for writing was mainly based on
> spelling and on good beginning middle and endings. I found that writing
> was difficult to assess as I was never very clear on what was needed to
> be assessed. I was always told that never to display a piece of work that
> had spelling errors and most of the time my children would have been
> editing their work for spelling mistakes. I now know that a badly piece
> of written work spelled correctly is still a badly written piece of work
> (SC7; RC3c).

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[47] For the purpose of this study teachers with more than ten years of experience were classified as more
experienced teachers while participants with less than ten years' experience were classified as
less experienced.

Another comment by an experienced teacher identified the use of success criteria in writing as an area for change saying:

> I also like the idea of writing up the success criteria so that the children know their goals and targets. I would tell the child the success criteria but having it written up reminds them of this and keeps them focused on the task (SC4; RC3c)

Even though the less experienced and more experienced teachers all had elements of practice they wished to change or develop the more experienced teachers, provided more nuanced descriptions of exact practice rather than general aspirations about changes to assessment practice. Similarly, the experienced teachers were able to highlight very specific practices they wished to change offering critical analysis of their current practice with a view to improving rather than trying a "new thing". Teachers with less experience tended to describe their current "good practice" and then describe the "new thing" they would try. They did not seem to modify current practice but do new things. Less experienced teachers were also more general in their comments for example

> "I feel that I need to do more on talking to the children about the success criteria and showing them work samples of varying qualities to help communicate to them what I am looking for. It will also enable them to begin to self-assess their work" (SC5, RC3c).

A similar general aspirational comment was made by a summer course participant with less than five years of teaching experience saying "I will give comments instead of grades and hopefully they will take them on board" (SC16, RC3c). It was interesting to note that less experienced teachers, teaching in contexts other than mainstream classroom settings (n=4), saw their context as limiting their practice in assessment with one MTP candidate saying "in the learning support setting, I feel somewhat restricted to use the same range of assessment practices that I might in my

mainstream classroom" (M2). Another teacher with three years of experience

commented:

> As an EAL teacher, I have been primarily concerned with the administration of the Primary School Assessment Kit (PSAK). This summative assessment documents the English language proficiency of pupils. I used the results to inform my planning, determine withdrawal groups and determine in-class intervention content. I would also use oral questioning and observation during EAL lessons to assess for learning, however, I found it difficult to implement a traffic light system with pupils who did not understand anything that I was saying. This made it more difficult to assess! (MT3; RQ1; q6)[48]

A similar type of thinking was evident when a less experienced teacher
commented:

> I have had little opportunity so far this year to implement many of the approaches as I am teaching in language support with infants with little to no English (M9; RQ3)

Working with younger students also seemed to be restricting to the practice of

assessment in the opinion of less experienced teacher

> I have only taught down the junior end of the school so peer talk on assessment has never really worked. I will have 6th class this September and I look forward to having the class self assess and peer assess a lot more (MT1; RQ1; q65)

More experienced teachers outside the mainstream classroom context (n=6), did not

express the same reservations about their teaching context affecting implementation

of assessment strategies. If anything, they felt their teaching context was an

advantage, as they could experiment with new ideas. Similarly, more experienced

teachers outside the mainstream classroom context, commented that they were in a

better position to influence other teachers. Less experienced teachers focused more on

the contextual restrictions of implementing assessment whereas more experienced

teachers seemed to focus more on the learning and the student need and the context

was not as prominent.

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[48] RQ1; q6: How have you learned about assessment up to now?

Initial Teacher Education in Assessment

On the first reflective questionnaire (Appendix A1) six participants indicated that they were fully prepared for assessment practice on entering the classroom as a teacher following ITE. It is interesting to note that following the professional development activity, each of the six, identified areas in which they needed to develop practice. These areas included peer-assessment, oral language assessment, writing and conferencing. Following the professional development activity, participants had become aware of areas for which they may not have been fully prepared. One very experienced participant provided a detailed description of assessment methods she had learned during ITE but having completed the PD activity realised how different her concept of assessment was to the ideas promoted during PD saying:

> Formative assessment has a whole new meaning for me after doing this course. Before this course, I thought Assessment was about Standardised testing, diagnostic tests, observations, Psychological Assessments....................After the course I think Assessment is about planned formative assessment approaches that engage the student and collaborative learning and feedback. (SC31; RQ2; q8)[49]

The findings demonstrate that experience rather than ITE alone has a greater impact on teacher learning. Experience helps teachers apply new knowledge rather than raise awareness of assessment.

4.9 The Learning Journey

Thus far, the data have revealed processes that result in teacher learning, in single episodic descriptions. The influence of the individual teacher experience and teaching context have also been considered. However, staying true to the explanatory case study approach the temporality of the learning has to be established (Yin, 2000). This gives the reader an idea of the interplay of environmental and personal attributes

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[49] RQ2; q8: Have your beliefs or thinking about assessment approaches changed after this course? If so describe what activity, task or resource resulted in this change?

and the progression of the learning in keeping with the findings of Lave & Wenger (1991), and Lervik et al (2010).

Participant contributions were used to trace a journey of learning among the participants who completed the follow up questionnaire (n=10). The initial reflective activities were not focused on reading, writing and oral language but on classroom assessment theory in general. "Big ideas" and assumptions about assessment were mentioned. The reflections "made me take more notice of what I did in college; government policy really affects the classroom" (MT1). The readings indicate "I need to move away from the gold star culture; I need to help parents focus on improving the learning rather than interpreting a score" (MTP5). These quotes are very reflective of the other participant contributions indicating an awareness of the new ideas presented in the literature and the role of reflection in developing participant learning and moving the learning from the big ideas to learning about new strategies. The three SC participants who began with the audit instrument and written reflective prompts (Appendix A1 Q.63 – Q.69) were more focused on specific classroom tasks than "big ideas". The learning in Module 2 was focussed on classroom strategies of questioning and discussion, sharing the learning intentions and using success criteria, feedback and peer- and self-assessment. Contributions from both MTP and SC participants were similar and are very much represented by the opinion that:

> Module 2 has opened up new ideas for my practice. It has introduced new ideas such as 'waiting time' when questioning and the use of a thinking hat - allowing time for the pupils to compose their ideas. This module has made me think about looking towards the pupil more and using them as a resource within the classroom (SC31; RC2c).

As the course progressed to Module 3 the learning was centred around the specific strategies of conferencing for assessing writing and the provision of quality feedback and how it can affect pupils. Modelling in the asynchronous learning

environment was used. Participants viewed video clips and interrogated practice from the teacher and student perspective. Discussion forum contributions provided opportunity for exploring new ideas and adapting the new learning in assessment for particular teaching contexts. The learning was evident in the contributions from both the MTP group and SC group. Similar outcomes were seen for oral language where the use of Drumcondra Writing Indicators (Shiel & Murphy, 2000) and the Primary Language Curriculum (2015) were identified by five participants, as items they would use to assess oral language. During Module 5, sharing of current practice was evident with one participant noting that "you can easily become overwhelmed by the amount of things to assess reading" (MT5; RC5c). However, each of the ten participants commented that they had learned easier ways to be more targeted in the assessment of reading by watching the NCCA videos. The modelling in the asynchronous setting involving interrogation of video was very effective. The assessment of reading was viewed as perhaps formal and cumbersome where now it could be carried out in a more integrated way and more frequently, without the emphasis on fluency, formal tests and record keeping as the only conceptualisation of assessing reading. In the follow-up data, nine of the ten participants described introducing new strategies in the classroom, of those nine, three participants referred to increased confidence in their school interactions about assessment. One participant explained how the course helped her understand that as a teacher she had "become caught in the crossfire about assessment" (MT3; RQ3).

The following excerpts (Figure 4.17 and Figure 4.18) trace the learning journey of two participants from initial engagement with asynchronous learning to classroom practice following teacher learning. Initial exploration of the theory of assessment, raised awareness of the teacher's own stance on assessment. Learning

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about specific strategies progresses to plans for the teaching context. Finally, the

actual actions in the teaching context are recorded.   It is notable the influence exerted

on the final learning by the micro level (Carless, 2005) of the participants and the

agency (personal domain) exercised by each teacher in response to the professional

development and the micro level.

Mary's Story (More than twenty years of teaching experience; Summer Course Participant)

I have learned so much about Summative and Formative Assessment during this course so far. It is so interesting, and it is actually part of my Post of Responsibility in our school.
The survey[RQ1]   makes me aware of what I know already and of
what I need to improve on and how more in-service might help this.

Before this course, I thought Assessment was about Standardised testing, diagnostic tests, observations, Psychological Assessments.....................After the
course I think Assessment is about planned formative assessment that involves the pupils and the teacher.

Some Teachers may need to be more flexible in their role as Teacher to assessor....
Some schools may need to look at their Policy on Assessment and review it.

The New Primary Lang. Curriculum booklet will help improve my practice in the assessment of oral lang. as it clearly sets out the steps, in sequence,
to be taken and also is very specific. Each milestone is very specific and therefore the feedback will be very specific and the assessment too. It requires the Teacher to be very focussed on the child's needs also.

I learned best during this course   from looking at the videos about: WALT, WILFI learned a lot from the PDST BOOKLETS which I had never seen before! I have Drumcondra English Profiles and I use them.
I also learned best by doing the Assignments.   I am now much more familiar with Summative Assessments and Formative Assessments.   I now understand the difference and find formative assessment most interesting.
*   I wrote notes from each article, from each video, from the*
PDST BOOKLETS...... I referred to these notes when doing my Assignments.

The approaches I mentioned helped me learn by reflecting on what I'm now doing in the classroom and for future planning, when I will
use   innovative approaches   and re-assess the outcomes.
I learned from watching video clips as I can see the approach in practise.
It reminds me of Micro Teaching in College.

To begin with, I will   put all the resources: PDST BOOKLETS .... into the folder   for all the Staff in the school.

I have been impacted in such a way that I could not wait to do self-assessment with a group of pupils I have in Learning Support
The pupils keep asking me every Friday: 'Are we doing Traffic Lights cards today?
They love it and they are so honest in their own assessments
My Principal was looking for a list of Diagnostic tests to look at.
Teachers now have Assessment folders in our school

Figure 4.17 Mary's Learning Journey

John's Story (5 years of teaching experience; Master of Teaching Participant)

I remember using various forms of AfL during teaching practice, including traffic lights, no hands up questions, talk partners etc. I believe we also tracked the progress of several pupils of various abilities to analyse our own teaching to the various ability groups in the class.
The initial influence on my assessment practice were the assessment modules and workshops with XXX during my initial teacher education.
Looking back now, it was comprehensive and up to date, and offered a thorough grounding in practices which I now come to realise are not altogether common. I know that I utilised many assessment strategies garnered from my initial teacher education in my first few years teaching, such as traffic lights, no hands up questions, talk partners. I have found though the longer I have been teaching, I have been letting some of the strategies fall by the wayside, despite the fact they have worked well. The biggest influence on my assessment practices though has always been the class I have been teaching at any one time.
With challenging classes, I have always found that oral feedback during work and at the end of work extremely effective, and with older children, I have made great strides towards putting into place a culture of learning intention sharing, classroom discussion and peer and self-assessment, since that's what I found through trial and error to be the most effective. Yet I know that sometimes I haven't fully followed through on these strategies and have a few times found myself going through the motions. Another influence on assessment practices has been the teachers I have worked with - working with highly experienced teachers, particularly in LSRT, has been vital in showing me the best ways to conduct standardised and diagnostic testing.
The Drumcondra English Profiles will definitely improve my practice in the assessment of oral language.
I will need to plan in much more details the strategies I can use - some I need to improve on to get them embedded in both my practice and the classroom culture, whereas others I need to not go through the motions and actually effectively implement them. Some of the assessment strategies above, I have not used so I will need to try them out.

I do often share learning intentions, and often demonstrate how "not" to do something, although the sharing of success criteria is less frequent and more informal. One area I am keen to improve is to gather up samples of excellent work across the curriculum for sharing as success criteria.

Self-assessment would not be appropriate for incoming Junior Infants, so two methods for gathering data would be anecdotal notes and checklists. There are a range of factors to consider when gathering data, such as the social situation, pupil interest, personality and ability, and whether English is the pupil's home language. This final point is particularly pertinent given the diversity of my school. Formative assessment needs to be school wide - from experience, it is extremely difficult to introduce or use AfL strategies in the senior class if it hasn't been part of their experience before. For me, planning and implementing an incremental change in school culture would be the greatest challenge to improving formative assessment in my school.

I spotted a recurring theme amongst Shirley Clarke's work which was the effect that teacher's assessment of writing can have on pupil's sense of esteem in relation to their writing ability. She identifies one of the inhibiting factors that assessment of writing can have, which I am often guilty of, which is a tendency to assess the quantity of work and presentation rather than the quality of learning. In a split class environment where you are attempting to give feedback to all of the pupils in the class in a short space of time, scanning of work and feedback tends to be rushed, with "Can I even read this?" and "Have they done enough work?" being the easy go-to options
I learned best from the pdfs of the readings and links to resources, as well as the PowerPoint presentations.
I wouldn't necessarily say my beliefs have changed, but more so that they have been reinforced. I have always agreed with the AfL and AoL approaches that we were taught in college, and have implemented them bit by bit, but following this course, I need to place much greater emphasis on integrating and adding the assessment approaches to the whole package of teaching and learning.

It [the asynchronous professional development] also boosted my confidence since it affirmed the practice which I had been unconsciously doing. It also made me want to be more proactive when it comes to implementing initiatives.
I have had little opportunity so far this year to implement many of the approaches as I am teaching in language support with infants with little to no English. Many of the answers below reflect this fact – I am certain that if I were in a mainstream class or LSRT that it would have a much greater impact.
Due to the nature of language support with infants, my use of assessment mainly revolves around sharing the learning intention at the beginning of a lesson, modelling how to speak, praising the pupils appropriately and providing opportunities for pupils to assist each other with correcting their language. Unfortunately, due to the nature of the role, I haven't really had an opportunity to put all of the assessment practices I plan to implement into use.

Figure 4.18 John's Learning Journey

The learning experienced by the participants commenced by becoming aware of the bigger, general dilemmas in assessment and the difficulty of unexamined practice, through the use of reflective prompts. However, through reflection on professional readings and a validated survey instrument participant thinking about assessment began to change. The learning then progressed to modelling specific strategies, using research based materials to generate learning and writing to consolidate learning. Reflective questionnaires were used following Module 5 and on return to the classroom. The return to the classroom focused on increased confidence and the use of specific strategies. However, ultimately the learning was affected by the environment in which the teacher operated as assessor and this needs to be explored during the asynchronous professional development. Otherwise as can be seen from *John's Story* (Figure 4.18) the learning can become disconnected from the classroom and from the students.

4.10 Teacher Learning in Assessment: A Multilayer Process

As stated earlier, teacher learning is a complex phenomenon and takes place in a multilevel environment (Carless, 2005), comprising the personal domain of the teacher, the school environment and the wider societal and policy environment. In order to explore teacher learning with a focus on the processes that promote learning complexity theory (Opfer & Pedder, 2011), and critical realism (Bhaskar, 1978, 1997) were used. The remaining part of this section will identify how complexity theory and critical realism were made visible during the study.

4.10.1 Role of Complexity Theory and Critical Realism

Teacher learning does not occur in isolation and the Interconnected Model of Professional Growth (Clarke & Hollingsworth, 2002), identifies the various elements of a teacher learning environment, discrete from the immediate environs of the

professional development activity. New learning in assessment, means teachers adopt an assessment identity aligned with the new learning. Identity is performed and lived in the everyday (Lave, 2008), open to construction (Bruner, 1990), and is social and mediated (Wertsch et al., 1995). Ultimately teacher learning will be reflected in the everyday practices used by the teacher as assessor. The use of complexity theory (Opfer & Pedder, 2011), as a conceptual framework is important as the authors argue research into effective learning processes must take account of the dynamic and interactive systems in which a teacher learns. Critical realism (Bhaskar, 1978, 1997), as a conceptual framework situates the effective learning processes in the layered reality of the asynchronous learning setting recognising the observed and unobserved processes that take place to bring about teacher learning. The combination of complexity theory and critical realism accommodates the situated nature of teacher learning, which implies that teaching cannot be separated from the context in which it takes place. Although Cochran-Smith et al. (2014), have focussed on initial teacher education as a complex phenomenon, teacher learning through professional development is still suited to the lens of complexity theory and critical realism as learning during teacher professional development is more varied than at pre-service level (Tang, 2010).The evidence and the visibility of complexity theory (Opfer & Pedder, 2011), and critical realism (Bhaskar, 1978, 1997), in this study is presented in Tables 4.10 and 4.11 each of which maps the significant element of the conceptual framework to teacher learning in the asynchronous learning environment.

The features of complexity theory (Opfer & Pedder, 2011), as mapped to this study in Table 4.10 include the self-organisation, where participants engage with a view to learning for their own context, and emergence of learning from a combination of factors such as school context, pedagogical process and personal beliefs. The short-

ranged relationships and the nested structure were evident in the constant monitoring by the facilitator-researcher, the use of emails and discussion for a nested within the levels of the teacher context and course structure. The asynchronous professional development activity was also ambiguously bounded through the use of optional interaction opportunities, facilitator-researcher contact and follow-up reflection. The activity was organisationally closed and focused on the community of practice of teachers as assessors. Structural determination was evident in the reflective prompts and the sequential nature of the learning modules. However, flux was evident in the responsive nature of participants to tasks that required planning for future practice in assessment.

The domains of the reality in which teacher learning take place are summarised in Table 4.11; these are the empirical domain, the actual domain and the real domain. The empirical domain consists of events experienced and observed. During this study the key element of the empirical domain is the teacher learning as identified by the learning frameworks (Hall & Hord, 2006; Harland & Kinder, 2015; Cochran-Smith & Lytle, 2000), and evidence of the agentic response to the asynchronous professional development. The actual domain comprises of events that happen even if they are not observed namely engagement with course material, reading, thinking, composing written answers, policy influences, contextual influences and course requirements. However, of significant interest and the focus of the research question is the real domain made up of the mechanisms that cause events at the empirical level to occur specifically the pedagogical process that result in learning such as establishing the participant profile, the use of assessment as pedagogy through modelling in the asynchronous environment, the use of research based assessment material to generate learning and the use of writing as pedagogy.

The learning was deepened through the use of reflection driven by quality prompts to establish cognitive presence, initiate insight into practice and develop the participant positioning as a member of the community of practice of assessors.

Table 4.10 Mapping the Features of Complexity Theory (Stanford, Hopper & Starr, 2015) applied to Professional Development Activity in Assessment (Adapted from Davis & Sumara, 2006; Ramiah, 2014)

Term; Key Aspect	Features from this study: Asynchronous Online Professional Development in Assessment	Data Collection	Findings and Implications from this Study
Self-Organised Interaction leads to transformation; Not centrally controlled.	Participant interaction with each other, with course material and with facilitator-researcher. Participants specify learning objective related to their teaching context. Participant interaction with individual school context.	Online interaction from discussion fora; Assignment posts; Reflective questionnaires.	Level of engagement with reflective tasks, course material and facilitator-researcher needs to be monitored by facilitator-researcher. Explicit discussion of personal, school and national context to allow participants understand influences that affect self-organisation and agency.
Emergent Qualities Quality arises from the synergy of factors.	Teacher learning emerges from the sharing of practice the interaction through discussion of practice, policy and research. Individual teacher beliefs and attitudes influence interaction. Learning emerges through shifting beliefs about assessment and accountability.	Online discussion posts; Reflective Journal Posts; Response to Academic Readings Assignment Posts Questionnaire; Individual Facilitator-researcher Emails Observing practice.	Assessment Knowledge Base (Brookhart, 2011; Xu & Brown, 2016; Smith, 2015) Facilitator-researcher needs robust framework and teacher education pedagogy to notice and guide emerging learning. James & Lewis (2012 Participants need opportunity to voice metacognition.
Short Ranged Relationships Close Interactions; Group Coherence.	On-going connection between students and facilitator-researcher; Electronic forum to create coherence; Scheduled contact; Social presence.	Online postings from discussion boards; Facilitator-researcher Postings to Create Social Presence, Individual Facilitator-researcher Emails.	Transparent, intuitive, well-defined course structure. Identification of common purpose to create a community through professional readings and discussion. Individual email feedback from facilitator-researcher to participants.
Nested Structure Students Nested within an Overall Structure	National Policy of Teacher Education; National Structure of Online Professional Development; Course Nested within Assessment Policy Context; Course structure nested with National Qualification Framework; Course Content nested with the reality of classroom practice, WSE reports, school based policies and school based culture and beliefs.	Course material & Resources; Online discussion; Policy Documents; Assignment Postings.	Macro-sociocultural and micro institutional contexts (Xu & Brown, 2016; Apple, 2016; Carless, 2005; Emirbayer & Mische, 1998) Reflection and discussion to identify and explore assumptions about assessment held by participants, their colleagues, and parent bodies. Reflection and discussion to identify and explore enablers and constrainers and political role of assessment (Koch & DeLuca, 2012; Klenowski, 2013) in personal, school and policy domains.
Ambiguously Bounded Complex forms Open; In flux with Surroundings; Adapting through feedback loops.	Continuous link with discussion of classroom practice and planned future assessment practice. Continuous discussion of policy changes.	Online discussion content. Individual emails from facilitator-researcher.	Frequent forum contributions. Reflective prompts to link with classroom practice. Email responses from facilitator-researcher. (Leahy & Wiliam, 2010).

Organisationally Closed Retain own identity; Constantly Interacting; Exchange energy and matter with their dynamic contexts.	Course maintained focus on developing teacher assessment in literacy but relating to teachers' individual context; Ordinary understanding of having strong assessment skills while maintain a sense of the individual teaching context.	Course Materials; Facilitator-researcher Responses; Assignment Postings.	Reflection to connect participant learning to individual assessment context. Establishing common purpose to provide alternatives to standardised test data.
Structurally Determined Behaviour limited by structure; To survive change from successive autonomous restructuring.	Students select assignments with reference to class level, school structure and context needs. Assignments are determined by choice of accreditation level e.g. Summer Professional learning, Masters, Professional Diploma.	Assignments; Facilitator-researcher Contributions.	Mandatory and non-mandatory course contributions. Course requirements impacted upon follow-up questionnaires and contributions to discussion forum.
Far from Equilibrium Always in Flux	Curriculum of Course is dynamic and responds to policy changes, student feedback and current research.	Reflective Journal; Participant / facilitator-researcher emails.	Identification of contextual influences on assessment practices and prompting participants to overcome challenges.

Table 4.11 Features of Critical Realism Bhaskar (1978; 1997) as mapped to this study

Critical Realism Domain Description	Features of this Study	Findings and Implications from this Study
Empirical Domain: Empirical Evidence of Events Event is actually experienced and observed Teacher Learning change of practice, belief or knowledge of assessment Cognitive Presence No learning is evident .	Open ended questionnaire contributions; replies to postings in online discussion boards; online postings in response to reflective questions; response to theoretical readings; responses to survey evaluating participants' current practice in assessment; individual email between facilitator-researcher and student.	Reflective Questionnaire Responses; Task Completion; Cognitive Presence; Teacher Learning observed through lens of "concern" (Hall & Hord, 2006); knowledge development; shift in beliefs, (Shulman, 1986; Tan & Nashon, 2013) "outcome" (Harland & Kinder, 2015).
Actual Domain: Actual Events Actual Level: Events that occur whether observed or not. They are generated by the mechanisms. Teacher Reading, Viewing Material, Composing Responses, Cognitive Presence**.**	Participants prior experience of Assessment Education; Individual Participant Teaching Context; School culture; parental expectations; participant motivation; DES Summer Course Guidelines; University Requirements; CPD National Policy.	Reading; Composing and writing reflective and non-reflective responses; Viewing course material; Participant experience; School Context; National Policy; CPD Policy; Course requirements.
Real Domain: Generative Mechanism: Real Level: Mechanisms that cause events at Empirical Level Pedagogical Approaches during course that lead to teacher learning, activities and processes that result in teacher learning.	Choice of instructional approaches; Discussion; Facilitator-researcher Probes; Planning for Classroom Practice; Responding to Theoretical Readings; Refection on Teacher Learning; Quizzes; Examining Current Classroom Practice; Facilitator-researcher Reflection on Practice; Facilitator-researcher's use of Formative Assessment Approaches.	Reflective Questionnaire Reflective prompts for professional readings; Frameworks to identify teacher learning; Research Based Course Materials as Generators of Learning; Modelling through video clips; Discussion of Research based Course Materials; Exploring Assumptions; Writing as Pedagogy.

4.11 Conclusion

Aside from the required Technology, Pedagogy and Content Knowledge (TPACK) for effective teacher education in the asynchronous online setting, the ability to bring about teacher learning through recognised, active processes is of paramount importance. In addition to understanding teacher learning as a progression, the teacher educator must respond to the demographic data as it influences how participants learn and perceive their own teaching. Teacher learning in the interactive asynchronous setting in this study was identified as a progression, where learners drew upon, and engaged in an interactive fashion, with available social and physical materials to construct new understandings. The pattern of learning did not take place within an isolated setting, but was highly entrained to the pedagogical processes initiated by the facilitator-researcher, participant teaching experience and teaching context. These influences were stronger than the academic experience of participants. Teaching context had greater influence on teacher learning the less time a participant had spent teaching. This highlighted the requirement of the teacher educator to be responsive to demographic data rather than just record the data in the asynchronous online setting.

Teachers also learn about assessment through their own practice in the classroom. However, the practice is influenced by messages from the environment in particular, by teaching colleagues and the parent cohort of the school. Willis, Adie & Klenowski (2013), maintain that assessment literacy needs to be defined in the context of the messages to which teachers are subject about curriculum. Moreover, as this study demonstrates, participants need time and space during asynchronous professional development to explore these influences and messages through reflection, as many contextual factors influence practice in assessment (Fulmer et al.,

2015). Such exploration involves pedagogies that allow participants to compare practice to that of expert practitioners through researched survey instruments, reflective responses to video clips and reflective coursework. Informed by Korthagen (2010), and Loughran (1997, 2007), reflecting on practice and prior experience is part of teacher learning however, it is notable that this study revealed the impact of participant experience on the capacity to reflect and learn. Follow-up data revealed teacher learning, and Schneider & Randel (2010), argue that the documenting of the impact on the teacher practice represents a "proximal outcome" (p. 269) for the student. The role of the follow up to professional development is of importance to quality learning.

De Luca, Klinger, Pyper & Woods (2015), argue that professional development evaluative claims can be made when linked to teacher learning goals and highlight the need for professional development efficacy to be linked to teacher professional judgement of their own learning achievements rather than to statistical evaluations. Asynchronous online professional development affords participants the opportunity to judge their own learning. However, it would not be accurate to say that self-evaluation alone is enough to evaluate learning. This study demonstrates the need for the facilitator-researcher to have learning frameworks by which to evaluate participant learning.

In the face-to-face ITE setting perspective building conversations and structured debates (De Luca et al., 2013), involved group discussion with peers of readings, assessment dilemmas and classroom practices. It also involved the provision of a common analytical scaffold to guide discussion. Students found the metacognitive development that took place as a result of the perspective building conversations helpful. Students reported an increased awareness of how to think about

their own conceptualisation of assessment. In the asynchronous professional development setting reflective coursework with a scaffold to aid response resulted in learning through changes in beliefs and outcomes. The literature indicates students valued tasks that help them understand what the assessment procedure would look like in the classroom (De Luca et al., 2013). The findings in this study reveal that knowing what the assessment looked like is not sufficient. Further depth in learning is needed. This is achieved through explicit modelling of the time structure needed to integrate assessment into teaching. Even though De Luca et al. (2013), state that explicit, planned modelling of classroom assessment practices along with explicit instruction on assessment practices is highly supportive to teacher learning in ITE, this study demonstrate that modelling in the asynchronous setting is not sufficient without careful exploration of perceived barriers.

Literature has argued that structured asynchronous learning where students are required to respond to other students rather than just access course material and respond, leads to deeper level of engagement than face-to-face or online synchronous learning (Northey et al, 2015). However, this study has shown the importance of individual reflection upon course material. Interaction and discussion helps the facilitator-researcher assess learning, but it is difficult to say that the discussion brings about the learning. The individual reflection, in this study, is a generative mechanism that brings about learning that is only demonstrated through discussion. This reflects the findings of Coppola et al. (2002), who in their study of asynchronous learning networks concluded that a more Socratic based pedagogy emphasising discussion and critical thinking is required to be an effective educator in asynchronous online settings. It can be argued that it is not the discussion but the critical thinking that brings about learning. It is therefore evident from this study that as Adnan & Boz,

(2015), have argued the prior experience of the teacher educator of teaching in an online environment has more of an impact on student learning than student experience of online learning.

The activities and processes that result in teacher learning during professional development have been discussed so far in this section. The framework guiding the discussion was made up by three stances adopted by the researcher. Influenced by the critical realist stance it was important that the facilitator-researcher could observe evidence of the desired outcome of teacher learning. The explanatory case study theory advocated the identification of the mechanisms that brought about the observed outcome with the caveat of ruling out any other possible explanations for the learning. Complexity theory framed the context and influences that come to bear upon teacher learning, in particular teacher learning in assessment.

The data indicate the effectiveness of properly constructed and purposeful reflective tasks as a pedagogy to bring about a level of learning. The validated survey instrument alongside qualitative reflective contributions resulted in learning. However, without a framework through which to view the both the reflective tasks and the participant contributions, quality learning cannot be identified by the facilitator-researcher. Participant satisfaction with a strategy does not always result in learning that can be assessed by the facilitator-researcher. Participant dissatisfaction does not always hamper learning; the reflective prompts and writing exercises rather than a particular medium result in contributions that can be analysed by the facilitator-researcher for evidence of learning.

Examining the contributions of participants, the facilitator-researcher needed to ensure cognitive presence (Garrison & Arbaugh, 2007), through the reflective presence of the facilitator-researcher. Otherwise it was difficult to identify learning.

The process of cognitive presence goes beyond description or repetition of course material. Exploration of new ideas and application or visualised application in a new setting of ideas or strategies presented indicate cognitive presence. Without cognitive presence, the learning is at a low level or perhaps non-existent.

Envisioning and planning implementation of new learning also requires the participant to explore influences in the assessment context at all levels (James & Lewis, 2012). Raising awareness of enablers and barriers to developing assessment literacy helps participants understand that the wider context beyond the classroom and "the strategy" influence their learning as a teacher. The process of exploring the assessment context is important for teacher learning. Otherwise, the professional development activity only becomes knowledge of strategies transmitted without a clear conceptualisation by the participant of the structures, actions and beliefs that bring the learning beyond decontextualised knowledge acquisition. At a personal level, the process of exploring assumptions is important to assessment learning in the teacher. However, the data have indicated that exploring contextual influences and assumptions can be difficult in a setting where participants are very influenced by compulsory and non-compulsory course elements, often disregarding the learning opportunity. In addition, teacher experience impacts upon the depth of reflection upon personal practice.

The impact of asynchronous online learning in the development of assessment literacy according to the data would seem to fall into two broad categories. One category is the area of developing the teacher as an agentic individual practitioner though the process and activities outlined in the previous section. The teacher PPAT (Box et al., 2015) and assessment capacity (Xu & Brown, 2016) is given space to develop through participant reflection and demonstrating cognitive presence. The

second aspect of the role of online learning is to promote the concept of teacher

agency (Priestley et al., 2012) and help teachers recognise the cultural, structural and

material influences (Biesta et al., 2015) upon practice and understand how to begin to

negotiate the complex assessment environment and develop their identity as an

assessor. Indeed, Lysaght & O'Leary (2017), highlight the role of teacher agency in

enacting new learning and responding to professional development.

The next chapter offers a discussion on the implications of the findings in this

chapter alongside some suggestions for further research.

Chapter 5 - Conclusion

5.1 Pedagogy and the Impact of the Asynchronous Learning Setting

The overarching aim of this study was to identify the pedagogical processes or generative mechanisms (Blatter & Haverland, 2015), that bring about learning during interactive asynchronous online professional development. The asynchronous professional development activity focussed on assessment theory and the assessment of reading, writing and oral language in the classroom environment. This is a timely contribution to research in the area of assessment education for serving teachers for two reasons. Firstly, given the prevalence of interactive asynchronous learning as a method of professional development in Ireland, with ten thousand teachers undertaking multiple asynchronous professional development summer courses annually (Drumcondra Education Centre, Personal Conversation, July 2017), this piece of research provides a timely and relevant contribution to the field of knowledge in this area. Secondly, as the data have revealed, teachers are working as assessors in environments dominated by the culture the psychometric legacy (Elwood & Murphy, 2015). Never before have teachers been positioned to provide a divergent conceptualisation of assessment to the most stalwart upholders of the dominant legacy of standardised test data, namely their own colleagues and the parent cohort of their school context. However, the provision of a credible alternative to the current conceptualisations of assessment, cannot happen without quality teacher learning which enables agentic responses, and enacts changes to practice and in turn influence others in the personal, school and societal domain of the teacher.

Complexity theory (Opfer & Pedder, 2011), supports the idea that teacher learning takes place within a complex set of three inter-related levels[50]. However, the teacher with effective professional development, can also act to influence at each level. Just as each level influences teacher learning and teacher engagement with professional development, so too can the teacher exercise agency, demonstrate a shift in identity and as a result exert influence and create new discourses. Critical realism (Bhaskar, 1978, 1997), offers a framework for presenting the constituent elements of a professional development activity capable of enabling teachers to develop their skill in assessment to influence others. Not all elements are visible, but nonetheless their presence is part of the learning process. Critical realism sees any reality as having three domains: the real domain, the actual domain and the empirical domain. A brief description of each domain is provided in Fig. 5.1.

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[50] Level 1 is the personal domain of the teacher and relates to the beliefs and practices of the teacher. Level 2 comprises of the school support and parental beliefs and values. Level 3 is concerned with the broader policy context and societal expectations around assessment (Opfer & Pedder, 2011)
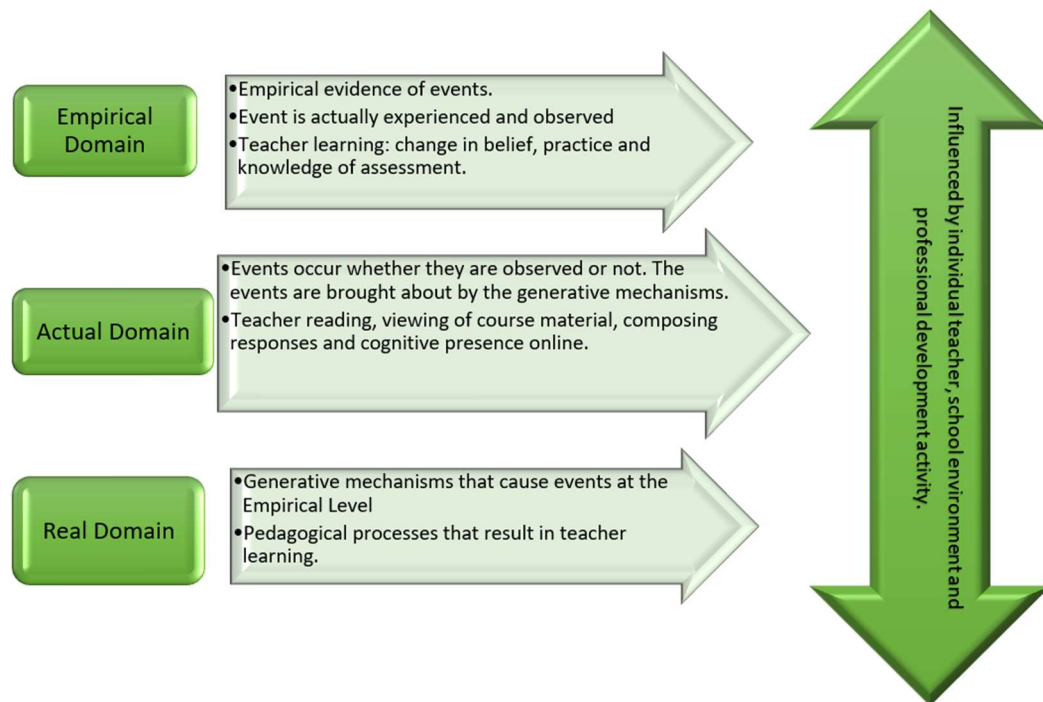
Figure 5.1 Critical Realism in the Asynchronous Learning Environment (Adapted from Bhaskar, 1978, 1997)

Critical realism also supports the idea than phenomena cannot be studied in isolation but must be examined with reference to the elements of the reality in which the phenomenon exists. Figure 5.1 provides an overview of the context and mechanism that influence teacher learning in the asynchronous setting.

5.2 Creating New Discourses: A Pedagogical Process

This study proves the efficacy, with which interactive asynchronous online learning, can create new discourses around assessment for teachers, both at personal level during the professional development activity and at school level. It also demonstrates the necessity of skilled and qualified teacher educators as online facilitators. The work also provides serving teachers with a contemporary, research influenced, context specific lens through which to examine practice, mediate assessment policy and counteract the culture of psychometric dominance. In addition, the findings confirm the inescapable influence of national and international policy in

assessment along with the potent influence exerted by unexamined perceptions of assessment in the classroom. The noteworthy impact of unexamined conceptualisations of assessment for participants themselves was revealed. More striking, however, was the considerable impact upon the participants of the unchallenged assumptions in assessment of their own colleagues, and parent bodies in their individual school setting.

The data collected from the interactive asynchronous professional development revealed the process by which teachers can be equipped to create new discourses in assessment. The new discourses began with an explicit examination of participants' individual perceptions of classroom assessment, and progressing to colleagues' perceptions of assessment and finally to parent conceptualisation of assessment. It was very apparent from this study, that teachers were awakened to the idea that parents' only experience of assessment has been through their own schooling or their current experiences of their child's schooling. Parents have no other way to learn about assessment and this places teachers in a unique position to change parental experience and conceptualisation of assessment and thus exercise influence over the context in which they operate as assessors.

The findings from the study focus on the explicit processes that result in teacher learning. Research to date has stated that pedagogies are important but offer little in the way of clear insight into the operationalisation of such a declaration. Figure 5.2 offers a summary of the research findings with a view to presenting a model of the key elements and processes that have been identified as promoting learning. From a critical realism (Bhaskar, 1978, 1997) perspective, each domain is identified and explained, in addition to the contextual factors that impact upon teacher learning. The pedagogical processes form part of the real domain, which is made up

of generative mechanisms that result in observable outcomes. The generative mechanisms, that is pedagogical processes, that result in learning include: establishing a participant profile, assessment as pedagogy, modelling, the use of research based assessment material to generate learning, writing as pedagogy, reflective prompts, ensuring cognitive presence, exploring assumptions, individual email feedback and exploring teaching context. The use of learning frameworks to identify participant learning is also important.

Contextual Factors influenced by Complexity Theory (Opfer & Pedder, 2011)

Level 1 Personal Domain of Teacher

Course Materials:
Professional Readings; Video Clips; Research based audit instrument; Research based classroom material; Primary Language Curriculum; Primary Curriculum.

Real Domain **(Generative Mechanisms that result in events at Empirical Level) Pedagogies:**
Reflection; Modelling; Developing Cognitive Presence; Visualising new learning in the classroom; Explore context; Explore assumptions; Use of teacher learning frameworks for professional development to examine new practice.

Actual Domain **(Events occur whether observed; generated by mechanisms)**
Participant Actions: Reading; Watching Video Clips; Composing and Writing Responses to Prompts; Planning Assessment Strategies; Interaction with other participants; Interaction with facilitator.

Empirical Domain **(Event is Experienced or Observed)**
Outcomes: Information; Awareness; Desire to know more; New Knowledge; Shift in Beliefs; Evaluation of Practice; Developing Teacher Agency; Planning for Change; Change in Classroom Practice; Influencing others to change; Conceptualisation of Teacher Learning; Lens to Evaluate Practice; Develop Reflection Skills Mediating barriers to agency; Evaluation of Teacher Learning (Hall & Hord, 2006; Harland & Kinder, 2015; Biesta et al., 2015).

Temporal Features: Establishing Common Purpose; Exploring Context; Exploring Beliefs and Assumptions; Focus on Specific Strategies; Identifying challenges; Planning for the Future; Implementing Change in the Classroom and School

Figure 5.2 Model of Key Processes that Bring About Learning

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The findings indicate assessment practice in Ireland is influenced significantly by several factors. These include formal government policy implementation, in particular, *Literacy and numeracy for learning and life* (DES, 2011), parental conceptualisations and expectations of assessment, the school environment, teacher colleague conceptualisations and expectations, individual teacher learning in assessment and individual teacher teaching experience. Such factors form part of the context in which teachers operate as assessors. The increased politicisation of assessment, alongside ambiguous articulations of research in assessment, and individual contextual factors mean that teachers are now in a position where they are dissatisfied with the current practices but are unsure how to meet this professional challenge.

The data indicated that teachers acknowledge the dominance of standardised test data and recognised the impact of this hegemony on their own thinking and practice in assessment. They also recognised the mismatch between teaching approaches and assessment approaches. The impact upon students and their parents was also recognised. An asynchronous online professional development activity in assessment is the first step for teachers, towards responding to the dilemmas inherent in assessment practice and exercising professional agency. The data also indicate that initially teachers may not have been aware of any difficulties, but following professional development a shift in thinking has occurred, as teachers now have a contemporary, research based framework through which they can examine practice in assessment and then make changes or sustain current practice and resist outside change. The temporal nature of teacher learning (Fig. 5.2) is evident in this study through the initial reflection on practice it does more than that it develops both motivation in the individual teacher and common purpose in the group of participants

to learn more about specific aspects of assessment. This progresses through to planning for the classroom and ends in examining the impact of new teacher learning in the classroom and school setting.

5.2.1 Discourse of Teaching and Learning

Quality learning in an asynchronous setting is underpinned by pedagogy and not technology. The findings of this study reveal the significant processes (Timperley et al., 2005), that bring about teacher learning. These are quality reflection underpinned by reflective prompts (Moon, 1999; Cowan, 2015), modelling of assessment approaches in the asynchronous learning setting, exploring context and key influencers of practice and promoting teacher agency.

5.2.1.1 Reflection

This study demonstrates that the use of quality, research based prompts (Cowan, 2015; Moon, 1999) to elicit responses, and aid reflection, is a necessary element of asynchronous professional development in assessment. Reflective tasks in this investigation, identified two significant findings, with respect to reflection namely, the role of reflection for the teacher as learner and the role of reflection for the course facilitator-researcher as teacher educator. Even though the literature argues that feedback is essential for learning (Wiliam, 2010), the findings from this study underscore the role of skilled monitoring of contributions by a teacher educator, competent in asynchronous teacher learning, professional development and assessment knowledge.

The participants viewed the asynchronous professional development activity as an opportunity to write for themselves as teachers and learners and thus gain knowledge through this process. Even though participants referred to writing as a method of learning, the tasks that resulted in quality learning used structured,

reflective prompts connecting new learning to future practice or existing beliefs. An unexpected finding was that teachers with greater levels of classroom experience were more skilled at describing their assessment practice and general teaching practices. They demonstrated a higher level of criticality with a greater awareness of the detail of practice and what has been learned from this experience. Even though the less experienced teachers have had more ITE input in assessment and an increased awareness of assessment choices, this study demonstrates, practice is needed to develop the skill of reflection and application of assessment theory rather than describing existing or planned future practice. The teachers in the Masters of Teaching programme benefitted from the extended time to explore practice as overall, they had less experience than the Summer Course cohort.

Professional development in assessment is imperative to facilitate teacher reflection as it offers a critical lens through which teachers can evaluate their own practice and respond accordingly. Strong evaluation of practice is a key factor in teacher agency. Teachers who prior to professional development thought they were prepared as assessors then realised the lacunae in their own assessment capacity are motivated to take action and assume stronger professional agency. Agency can mean instigating change or defending current practice in order to resist outside policy and cultural influences.

Reflective coursework provided the teacher educator with the structure to identify teacher learning through the use of researched frameworks (Hall & Hord, 2006: Harland & Kinder, 2015). Reflection also provided the opportunity to identify and challenge assumptions presented by participants that did not support teacher learning or quality practice in assessment. The use of individual email from the facilitator-researcher in response to reflective writing allowed teachers to deepen their

learning beyond repetition of course material. It also allowed for targeted feedback to counteract the variation in teacher experience which is a significant contextual factor in asynchronous online professional development.

5.2.2.2 Modelling the Experience

In the asynchronous setting, enacting modelling of assessment practices such as conferencing through the use of video clips and a reflective task was a very effective learning process. This approach to modelling allowed teachers to see into the practice of others and engage in critique and interrogation (Woodward & Machado, 2017; Loughran, 2007). This pedagogy can be extended by exploring the constraints to implementing new learning such a time and large numbers by providing video clips focusing on these aspects. This is transferrable to other domains apart from assessment learning for teachers. Modelling helps teachers visualise new learning in their own professional learning context and suggest adaptations to other teachers who feel overwhelmed by structural challenges such as time or class numbers.

Even when participants indicated they were prepared for classroom assessment following ITE they were either inexperienced or had an underdeveloped conceptualisation of assessment. Teachers were prepared for whatever their apprenticeship of observation indicated they need to be prepared for but not for a research based assessment framework. Teachers require a clear vision of what assessment should look like and how the time can be managed. Otherwise, implementation becomes too great a challenge and the teacher may not progress beyond the level of non-user (Hall & Hord, 2006), or third order outcome of new information and awareness (Harland & Kinder, 2015). Visualising explicitly the use of time for assessment within the lesson timeframe was crucial for progression of

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teacher learning beyond new information and awareness. If not, the mental image of quality assessment will be sourced from prior experience of assessment as either teacher or pupil and any learning from the professional development activity is at a minimal level.

5.2.2.3 Context

Teaching context and teaching experience are connected when assessment is considered. Teaching context is less of an influence on assessment practice as a teacher gains experience in the classroom. The individual teacher with the experience dictates the practice and does not see assessment confined to the mainstream classroom setting or "their own class". Establishing the link between assessment and teaching in conjunction with exploring context is key. Opportunity to explore this connection and understand that assessment is about the individual student teacher relationship and the principles of assessment extend beyond the mainstream classroom setting.

Exploring context also allows teachers to identify the enablers and constraints that exist for them as assessors (Emirbayer & Mische, 1998). Exploring context and learning about assessment also allows teachers to resist external policy, parental and colleague expectation if they are incompatible with teacher beliefs around assessment. Laskey (2005), has argued that this capacity to resist external forces is a powerful element of professional agency. The participant profile data revealed an unexpected finding with regard to teaching experience and the outcome of professional development. Teachers with more experience were less concerned with the teaching context as a constraint to assessment practice. Teacher educators need to take cognisance of the fact that prior learning in assessment appears not have the same impact on teacher learning as teacher experience. When participants are engaged in

asynchronous online learning the facilitator-researcher needs to be aware of the importance of past experience for discussion and grouping and allow extra time for lesser experienced teachers to critically examine their own context and appreciate the impact upon their own learning as a teacher.

5.2.2.4 Cognitive Presence

Cognitive presence is the level to which course participants in online asynchronous settings can contribute meaningfully to tasks and discussions and develop their own learning (Garrison & Arbaugh, 2007). However, without a specifically reflective presence on the part of the facilitator-researcher, cognitive presence was not evident. The necessity to elaborate upon what the literature refers to as a teaching presence (Garrison, Anderson & Archer, 2000), was very evident in this study. Figure 5.3 illustrates a modification of the required elements of the asynchronous learning setting; overall the study strengthens the idea that the reflective presence of the facilitator-researcher is necessary to develop the cognitive presence of the participant.

Cognitive Presence

Learning through discourse and reflection.

Tasks and individual email.

Social Presence

Setting Climate

Welcome posts; Email.

Teacher Learning during Asynchronous Professional Development.

Reflective Presence

Initiating and Sustaining Reflection: Prompts; Email.

Monitoring Contributions.

Teaching Presence

Selcting Content; Structuring Course.
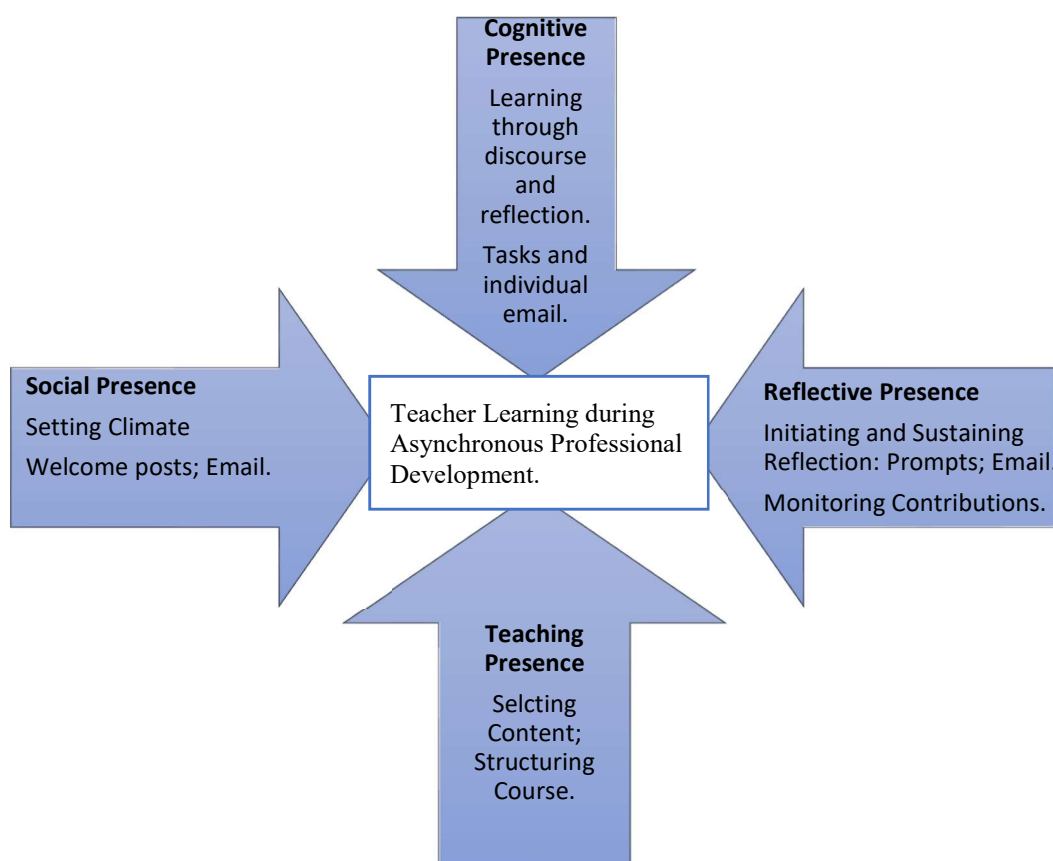
Figure 5.3 Community of Inquiry adapted from Garrison, Anderson & Archer (2000)

The study has raised the issue of the requirement of a teacher educator skilled in providing reflective prompts to deliver professional development. Teaching presence is defined as instructional organisation appropriate to the online environment. This study makes a significant contribution to the explication of teaching presence by adding the dimension of reflective presence necessary for high-level learning. Even though the literature refers to the necessity of reflection no distinct process of initiating reflection is explored.

5.2.2 Discourse of Identity and Agency

Apart from resisting influences (Laskey, 2005), teacher agency is viewed as a powerful sense of responsibility for your own practice as a teacher alongside the ability to conduct robust evaluations of your own practice (Edwards, 2015). Agency, it can be argued also enables the teacher to respond to challenges and make choices

about assessment. However, Biesta et al. (2015), in their conceptualisation of agency identify cultural, structural and material influences on agency. These influences act as barriers of facilitator-researchers of teacher agency. The professional development activity provides a robust, well researched lens through which a teacher can examine their practice in classroom assessment. Interaction with other participants in online discussions, reflection on professional readings, the opportunity to explore influences on assessment practice, and the visualisation of alternatives assessment approaches all foster responsibility in a teacher. However, taking Biesta at al's. (2015), stance the barriers and facilitators of agency need to be examined. Feeling responsible and having the tools to evaluate are not enough to develop agency. In addition, teachers need to be given the tools to understand and maximise access to agency facilitators such as time, beliefs, language of assessment, discourses, resources, physical environment, relationships and trust. This study is particularly valuable as it is a method of developing teacher agency by allowing space for reflection and discussion rather than transmission of the latest knowledge in the field of assessment.

As discussed in Chapter 2 much of the literature on teacher agency concentrates on theorising and presenting models of the phenomenon and less is written about how to develop teacher agency. The findings from the follow-up data in particular demonstrate the significance of teacher agency in responding to asynchronous online professional development. Agency can be developed in two ways. The first is to help teachers map out their own personal model of agency by identifying their own barriers to and facilitators of decision making with relation to assessment. The use of reflection as a pedagogy focused on examining context, and provides a suitable mechanism for such learning. The second, is to allow teachers the space to plan how to negotiate the elements of their assessment context such as time,

beliefs, language of assessment, discourses, resources, physical environment and relationships. To develop agency, it is not enough to identify the elements, otherwise teachers begin to think that they operate in an environment with no control. The asynchronous professional development setting provides a structures approach to deepening teacher learning and facilitating an agentic response through follow up.

5.2.3 Discourses of Policy

The findings from this study have significant policy and practice implication in the area of interactive asynchronous professional development. There is a definite need to ensure that providers of interactive asynchronous professional development are skilled in teacher education rather than just knowledge experts in a particular area.

5.2.3.1 Ensuring Quality Provision

Course providers have an onus to ensure they offer the best possible asynchronous professional development. It is not enough to promote the course facilitator-researcher as having extensive practical experience in a subject domain or indeed strong links to a commercial educational product. A definite policy is needed for the monitoring of the qualifications and pedagogical expertise of teacher educators providing asynchronous professional development. Teacher educators engaged in asynchronous professional development provision should have recognised professional qualification in teacher education which includes modules on reflection, teacher learning frameworks and asynchronous learning theory. The actual technology and learning platform should not take precedence over the pedagogical expertise required to teach content. The literature has indicated the importance of pedagogical processes rather than technology (Schwartz, 2013; Bernard, 2004; Means et al., 2010), in online learning settings and this is confirmed by the data in this study. However,

many HEI's provide technological assistance but do not provide any pedagogical support or monitoring to course providers beyond the feedback of course participants.

Reflection resulted in teacher learning, however, without knowledge of teacher learning frameworks (Hall & Hord, 2006; Harland & Kinder, 2015), and assessment theory the course provider is not in a position to evaluate the teacher learning. At present, the course presentation, student experience, facilitator-researcher interactions and facilitator-researcher subject knowledge are evaluated by HEI authorities. On the other hand, the skill of the course provider in assessing teacher learning is not afforded weight. To enhance quality provision the assessment capacity of the course provider skill base in teacher education should be evaluated. Otherwise, professional development may be reduced to a transmission model of learning with learning remaining at the level of repetition of course material and description of practice with no clear connection to reflection and higher-level teacher learning.

5.2.3.2 A New Model of Asynchronous Summer Professional Development

The current model of interactive asynchronous professional development is availed of by in the region of ten thousand teachers each summer, with many teachers undertaking multiple such professional development activities. This is due to the incentivised structure enshrined in Irish policy which allows teachers extra vacation time during the school year on demonstration of satisfactory completion of a professional development activity. The mandatory elements of this model work very well with almost full completion rates. However, the non-mandatory elements have very low completion rates even though these elements are proven to deepen learning. A change in the current structure would deepen the learning.

The lower response rate for non-mandatory coursework made it difficult to collect follow-up data about classroom practice after the professional development

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activity. For many participants, the professional development activity may have ended when the final mandatory contribution was made. However, deeper levels of learning, a different orientation and the temporal nature of teacher learning were evident in the follow-up data. The follow up data level change Hall and Hord (2006), need to allow change to happen asynchronous model very effective when followed up.

It has to be recognised that the current professional development policy of awarding extra personal vacation (EPV) for course completion with meaningful engagement, during the asynchronous online portion, results in high completion rates of online professional development. However, it must also be acknowledged that the learning may not go beyond non-user (Hall & Hord, 2006), or new information and awareness (Harland & Kinder, 2015). Even though Cochran-Smith & Zeichner (2006), argue that any change in belief is teacher learning, without follow-up action, learning is partial and ineffective. Meaningful engagement and evidence of learning progression beyond belief and awareness should be valued. Currently, in Ireland, ten thousand primary school teachers undertake online professional development activities each summer. Many of these complete three online courses in order to avail of the maximum allowance of five EPV days. However, as it stands there is no requirement to assess the teacher learning beyond the written online contributions.

Although the courses are subject to DES inspection, no follow-up data is collected. If the DES require "meaningful engagement" for online participants surely meaningful learning as it extends to the classroom would result in better quality professional development provision. Instead of completing three courses at a minimum learning level, providing extra EPV for evidence of higher level of learning would result in more meaningful and sustained professional development. It would also ensure that course providers are responsible for teacher learning beyond raising

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awareness and providing new information. This approach would also bring about a change in the way teachers experience their own learning through professional development. At the moment, the most common method of professional development is failing to establish strong links with practice as there is no requirement to monitor teacher learning beyond quite a low level despite stringent and at times onerous requirements for course content. There is also little in the way of monitoring the qualifications of course providers. More regular connection between classroom practice and theory for a larger number of teachers would be of greater benefit to teachers and students.

5.2.3.3 Developing Teacher Assessment Capacity

From a policy perspective, there is much rhetoric about the need of teachers to improve their assessment skill base and implement a wide variety of assessment approaches in the classroom setting. The findings of this study go a long way to show how the conceptual framework of teacher assessment literacy (Xu & Browne, 2016), can be developed in individual teachers. The asynchronous professional development activity in assessment addresses the discrete components of assessment capacity. The components of teacher assessment literacy include the teacher knowledge base in assessment, a teacher's interpretive framework for assessment, teacher conceptions of assessment, contextual influences, decision making capacity in assessment and the teacher as classroom assessor. The findings from this study provide new understanding of how assessment literacy in teachers can be enhanced through asynchronous professional development. In turn, this makes a noteworthy contribution to the literature on teacher learning in assessment as the study demonstrates how learning can occur and be transferred to the classroom setting.

5.4 A Model of Asynchronous Online Professional Development in Assessment

The pedagogical approaches experienced by the participants in the asynchronous setting resulted in learning. Nonetheless, the trajectory of the learning needs to be broken into discrete processes to allow other asynchronous facilitators, course providers and course evaluators in the asynchronous setting view the learning path and the influences exerted upon participant progress. The influences come from several sources. These sources of influence include the participant teaching experience, teaching context and agentic response by the participant to professional development Influences on learning also come from the course facilitator-researcher who needs skill in the asynchronous setting to counteract effects on learning inherent in the participant. A summary of the learning path is offered in Figure 5.4 which sketches out the processes necessary to bring about learning in assessment during asynchronous professional development. These processes include gathering and responding to demographic data, exploring "big ideas" of assessment through reflection on research bases assessment material.

Begin the Learning: Collect demographic data to establish participant chararteristics: teaching experience; teaching context.

Progress the Learning: Explore "Big Ideas" about assessment practice and policy through the use of research based reflective questionnaire; Discussion forum; Reflective journal entry.

Progressing the Learning Identify the presence of a common purpose and motivation to learn more about specific assessment strategies.

Progressing the Learning Learn about individual assessment strategies through assessment as pedagogy; Modelling, Reflection, Writing as pedagogy.

Deepening the Learning:

Ensure cognitive presence;

Explore assumptions following learning;

Explore membership of a community of practice of assessors.

Envision new strategies.

Explore contraints to exercising agency in assessment referring to Complextiy Theory (Opfer & Pedder, 2011).

Explore developing an assessment identitiy.

Reflect on learning as a teacher and share Learning Frameworks as a self-assessment tool.

Apply the Learning: Refelctive diary and evidence of use and impact in the classrrom / school.

Current Extra Personal Vacation Provision of three days.

Additional Extra Personal Vacation days to demonstrate new learning at classroom or school level.

Ongoing Actions of Facilitator

Responsive to participant characteristics;

Monitor contributions

Use learning frameworks to identify teacher learning (Hall & Hord, 2006; Harland & Kinder, 2015).

Cultivate reflective presence.

Individual email to challenge assumptions.

Figure 5.4 Model of Asynchronous Online Professional Development in Assessment

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Modelling assessment to the participants by the use of learning intentions, success criteria and self-assessment along with modelling through the use of video and reflection are also necessary. To deepen the learning, the onus is on the facilitator-researcher to ensure cognitive presence is evident in participant contribution. Furthermore, the facilitator must ensure assumptions about assessment are explored in conjunction with allowing the participant to reflect upon their membership of a community of practice as an assessor. The participant teaching context has to be examined through the lens of complexity theory with a view to understanding agentic response to professional development and factors that impact upon this response. Finally, to apply or consolidate the learning a follow-up section of asynchronous professional development must be present.

5.5 Limitations

The scope of this study was limited by the sample size and it is unfortunate that the cohort size for each participant group, namely the summer course participants (n=35) and the Master of Teaching cohort (n=12) was so unequal. Therefore, it was difficult to carry out any significant comparative statistical treatment of the data collected. Nonetheless, significant insight and understanding of teacher learning in the asynchronous setting was gained. An additional limitation to this study was the fact that although the participants gave informed consent, stating contributions made could be used in the study, not all contributions were required for course completion purposes. This resulted in varied response rates to certain aspects of the course. As the facilitator-researcher was employed by a HEI to provide in-service education, the course requirements were in some instances beyond the remit of the facilitator-researcher. For example, the online forum to discuss issues arising during the course was used by two participants. Also, the follow up questionnaire about classroom

practice was not a course requirement for completion so response rates were considerably lower than the rest of the study.

5.6 Recommendations for Future Research

A review of all interactive asynchronous professional development provision in order to determine the overall efficacy of activity. In addition, further work needs to be done to explore the pedagogical processes that bring about learning during asynchronous professional development in other subject areas apart from the assessment of literacy in the classroom. A further study could assess the efficacy of quality research based reflection as a learning tool in face-to-face professional development activities.

The unexpected finding from this study was the impact of the length of participant teaching experience on teacher perception of assessment, teaching context and teaching. Nonetheless the study confirmed the thinking that practice alone is not sufficient for teacher learning. Further work is needed to refine this finding and explore the links between experience, quality ITE in assessment and teacher assessment literacy. This study also revealed the impact of quality asynchronous online professional development on teacher agency. Additional work is needed to explore the factors that develop teacher agency and in turn track agency over a period of time to investigate the stability of the phenomenon.

5.7 Recommendations for Practice

The following are a list of recommendations based on the outcome of this study.

- Teachers who undertake asynchronous professional development should be granted additional EPV days on completion of a follow up module to demonstrate application of new learning in a classroom

context. This would prevent teachers from engaging in several interactive asynchronous professional development activities at a superficial level and encourage deep and meaningful engagement over a sustained period.

- Course providers should ensure that all facilitators in the asynchronous learning setting have secure TPACK and have the capacity to evaluate the choice of technology. Course providers also need to ensure a strong reflective and responsive presence throughout the period of asynchronous learning. Facilitators should have opportunities to deliver asynchronous professional development in a monitored environment to aid their own development as teacher educators in an asynchronous setting. Particular attention should be paid to the reworking of the Community of Inquiry (CoI) Garrison et al. (2007) model of asynchronous online learning with the addition of the explicit reflective presence of the facilitator. In addition, the learning journey must be mapped out by the facilitator.

- As there has been no national provision of professional development in assessment, all teachers should be granted access to interactive asynchronous learning opportunities throughout the school year and nor just as a Summer Course, with a view to earning EPV days, up to a maximum of five at any point throughout the school year. This would facilitate quality follow up in teacher learning leading to a direct connection to the assessment context rather than waiting "until I get back to school" to identify and deep learning.

- Teachers undertaking asynchronous professional development should critically evaluate the course provider and facilitator to ensure, as learners, they are receiving the best quality asynchronous professional development available. Asynchronous online learning depth is only achieved through quality reflection (Moon, 1999, Cowan, 2014). Otherwise the asynchronous model is reduced to the transmission of knowledge without quality pedagogy.

5.8 Reflection on Learning as a Teacher Educator

The study provided a lens through which the facilitator-researcher could reflect on practice as a teacher educator in an asynchronous setting. Although the principal aim of the study was to identify the pedagogical processes that bring about learning during asynchronous professional development, it has to be acknowledged that a link exists between the course facilitator and the pedagogical processes employed. A key piece of learning for the facilitator-researcher was the challenge in the asynchronous environment to be responsive to the characteristics, and not just the contributions of the course participants. The study has shown how teaching experience impacts upon participant reflection, upon participant learning both in the short term and in the longer-term, beyond immediate course participation. This must be factored into the course structure. The findings also formed part of the learning about practice of the facilitator-researcher. Apart from the TPACK required, the additional dimension of allowing for participant teaching experience is an element of the teaching context for the researcher-facilitator.

Professional development in assessment raises awareness, fosters beliefs and equips participants with the language and terminology of assessment but the facilitator-researcher had perhaps underestimated the level of support needed to

facilitate participants mediate perceived constraints to implementing new learning. Participants must be given explicit discrete input about the time it takes to integrate new learning in assessment into teaching and apply the new learning in their teaching context. The role of individual email response is very important for deepening learning and must go beyond acknowledging contributions. The interaction must challenge assumption, seek deeper engagement with material and stimulate exploration of participants beliefs and level of learning. The facilitator-researcher appreciates the role of email and although affordances of email were acknowledged the impact was greater than anticipated.

From an ethical viewpoint two key issues arose for the researcher. The first was the issue of coercion and undue influence to consent to the use of participant data. The second was the issue of confidentiality around the identity of the participant. The literature highlighted the issue of coercion and influence (Cohen et al., 2011), and it has been acknowledged in Chapter 3. However, the researcher-facilitator thought the course contributions were made without influence and demonstrated learning and enthusiasm for the content and usefulness in the classroom. The contributions were made as part of the course requirements and not in response to "research questions". Indeed, from previous iterations of the asynchronous professional development activity no discernible difference was apparent to the facilitator. However, the follow-up data collected when participants returned to the classroom, was not part of earlier iterations. It was interesting to note that the follow-up data contributions were not required for course completion. Given the fact that only ten participants from the original forty-seven completed this part of the activity, it was reasonable to assume that those who did, took part of their own volition. The issue of confidentiality was important to the researcher not only from a data viewpoint but from the point of the

HEI and the course provider. Participants have expectations in an online setting and a relationship of trust is important. If this trust is breached it can affect the quality of the research and the quality of teacher learning. The facilitator-researcher anonymised and coded all contributions gathered from the online setting in order to safe guard the participants and the HEI. The data gathered was anonymised once it was downloaded from the HEI learning platform. However, the HEI platform archive facility was used to store the original data. This was useful for verification and triangulation purposes.

5.9 Conclusion

Teacher professional development is at a critical policy juncture in Ireland with the publication of the framework document for teachers' learning (TC, 2016), combined with the fact that up to ten thousand serving teachers undertake multiple iterations of interactive asynchronous professional development annually. The publication of the framework document "paves the way for a period of research, led by teachers, which will inform national implementation of the framework" (TC, 2016, p. 1). The framework also situates sustained reflection at the heart of professional development for teachers, alongside the need for quality learning in assessment to be made available for teachers. This study, set in an authentic interactive asynchronous learning context, offers an evidence based model of professional development, suited to meeting the learning needs of teachers operating in complex teaching and learning contexts. The processes that bring about deep learning were clearly identified and need to become part of all interactive asynchronous learning. In addition, the establishment of an incentivised link to the teaching context that extends beyond the course duration is key to bringing about teacher learning. During the professional development activity key effective processes were identified as generative mechanisms for teacher learning. These included reflections on participant assessment

practice using a validated survey instrument, reflective prompts underpinned by a research based framework and participation in a community of practice related to the teaching context. In addition, targeted email responses to challenge assumptions, facilitator use of frameworks to identify learning and developing, and monitoring teacher agency were proven to be successful. Throughout the activity quality prompts to operationalise the cognitive presence of the participant were also valuable. Unless learning in the asynchronous setting is provided by facilitators skilled in pedagogy and technology, deep and effective teacher learning will not happen. Attractive user-friendly technology and "satisfied" participants do not equate to the quality of learning espoused by current policy frameworks. Deep, meaningful, and effective learning, endeavouring to develop skilled assessors with strong assessment identities and robust agency will only happen with research based asynchronous professional development underpinned by evidence based research studies.

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How Teachers Learn best about Assessment

Who is doing this research?

The research is being carried out by Barbara Collins, course tutor, adjunct lecturer and Doctoral student at St. Patrick's College, Drumcondra, Dublin 9. The research will be supervised by Professor Fionnuala Waldron, Dr. Eithne Kennedy and Dr. Zita Lysaght each of whom is a member of the Education Department in St. Patrick's College, Drumcondra.

What is the purpose of the research?

Assessment of student learning is a very important part of teaching. Teachers who are able to select and use the most suitable assessment method are said to have good assessment literacy. However, there has not been much research into how teachers best learn to become assessment literate. There has been a study about preservice teachers in California. My study sets to identify the ways in which serving teachers best learn about classroom assessment of student learning, on an online course in classroom assessment. I hope that this research will benefit other teachers, course providers and children in classrooms by helping understand better how teachers learn about classroom assessment.

Why have I been invited to participate in this research?

You have been invited to take part in this research as you are a teacher doing a course on classroom assessment.

What does this research involve?

This research project will involve the following:

- A literature review;

- Data collected from online posts and learning activities during the course;

- Follow up questionnaire about the impact of the course on classroom practice;

- Evidence of classroom practice e.g. student work, video clip, observation

- The research is due to be completed by June 2017;

- The findings of research will be used to write a thesis and may be disseminated by publication in a peer-reviewed journal or through conference presentations.

Confidentiality and data storage

With participants' permission, interviews will be recorded on tape and later transcribed for analysis. Each participating teacher will be given a pseudonym to ensure anonymity, and within the limitations of the law, confidentiality will be respected at all times. No individual will be identifiable in any report or publication arising from the research. Transcripts and data related to the project will be held electronically at St. Patricks College for a period of 5 years. After this time data, it will be destroyed.

How will I benefit from the Research?

It is hoped that participation in the study will provide participants with an opportunity to reflect on their understanding and practice in relation to learning about classroom assessment of student learning. Furthermore, recommendations from the study will benefit teacher educators by informing discussion and future curriculum development in the area of teacher education, continuing professional development in assessment and online learning.

Are there any risks to me from taking part in this research?

Students may feel under pressure to participate as the researcher will also be the course lecturer. Participation is voluntary and all details provided for research purposes only. Participants may withdraw from the study at any point. There will be no penalty for withdrawing before all stages of the study are completed. The relationship between the participant and the researcher and the participant and the college will not be affected.

Who can I contact if I have any further questions?

If you have any further queries contact Barbara Collins at St. Patrick's College, Drumcondra.

Email barbara.collins25@mail.dcu.ie

If participants have concerns about this study and wish to contact an independent person, please contact:

The Administrator, Office of the Dean of Research and Humanities, Room C107, St Patrick's College, Drumcondra, Dublin 9.

Tel +353-(0)1-884 2149

I have read the information provided.

  I consent voluntarily to be a participant in this study

Appendix A1 Reflective Questionnaire 1

Q.1. How many years teaching experience have you?

0-5 years

6-10 years

11-20 years

20 + years

Q.2. What is your current teaching role?

Teaching Principal

Mainstream Class Teacher

Special Class Teacher

Resource Teacher

Learning Support Teacher

Other: subbing in different schools

Q.3. Initial Teacher Education: How would you describe what you learned about Assessment in college?

Excellent, I knew what to do when I started teaching

Useful, but I was not fully prepared for the classroom

Not relevant to my teaching situation, I was not prepared

Do not remember

Did not have any Assessment Module

Q.4. My Learning Before Commencing Teaching: Comment on your learning about Assessment during your teacher preparation.

Q. 5. Teaching Practice: Describe anything you learned about Assessment during Teaching Practice (School Placement)

Q.6. My Learning about Assessment as a Teacher: How have you learned about classroom assessment up to now?

Q.7. My Learning in Assessment as a Teacher: Have you done any other course or professional development in assessment? If so give details.

Q. 8T Learning intentions are shared with pupils at appropriate times during lessons (e.g., Halfway through the lesson, the teacher might say: "Remember, we are learning to distinguish between 2D and 3D shapes").

Q9 T Learning intentions are stated using words that emphasise knowledge, skills, concepts and/or attitudes i.e., what the pupils are learning NOT what they are doing.

Q10T Pupils are reminded about the links between what they are learning and the big learning picture

Q 11 P Pupils are provided with opportunities to internalise learning intentions by, for example, being invited to read them aloud and/or restate them in their own words.

Q 12 T Child friendly language is used to share learning intentions with pupils e.g. we are learning to make a good guess (prediction) about what is going to happen in the story.

Q 13 T Success criteria relating to learning intentions are differentiated and shared with pupils.

Q 14 P Samples of work are used to help pupils develop "a nose for quality".

Q 15 T Assessment techniques are used to assess pupils' prior learning (e.g., concept mapping…).

Q 16 T Pupils are reminded of the learning intentions during lessons.

Q 17 P Learning intentions are available throughout lessons in a manner that is accessible and meaningful for all pupils (e.g., written on the black/whiteboard and/or in pictorial form for junior classes).

Q 18 T Pupils' progress against key learning intentions is noted and/or recorded as part of lessons

Q 19P Pupils demonstrate that they are using learning intentions and/or success criteria while they are working

Q 20 P Pupils are given responsibility for checking their own learning against the success criteria of lessons.

Q 21T When planning lessons, key, open-ended questions are identified to ensure that pupils engage actively in lessons

Q 22 T Assessment techniques are used to facilitate class discussion (e.g., brainstorming)

T Q 23 Questions are used to elicit pupils' prior knowledge on a topic.

T Q 24 During lessons, hinge questions are used to determine pupils' progress in lessons

Q 25T Assessment techniques are used to activate pupils /get them thinking during discussions and/or questioning

Q 26 T Assessment techniques are used that encourage all pupils to engage with questions e.g. no hands up, names out of a hat

Q 27 P Assessment techniques are used to encourage questioning of the teacher by pupils (e.g., using hot-seating or a Post-Its challenge).

Q 28T Questioning goes beyond one right answer style

Q 29T The pace of discussion is slowed down and pupils are encouraged to think before responding e.g. wait time.

PQ 30 Pupils are asked to explore their own ideas with others, using think-pair-share, for example.

Q 31 P Pupils are encouraged to share the questioning role with the pupil i.e. teacher routinely invites pupils to question their peers' contribution to discussion.

Q 32P Individual answers to questions are supplemented by pupils taking an answer round the class so that a selection of responses from the pupils is used to build a better answer.

Q 33T Pupils' incorrect responses are used to guide teaching and learning (e.g., a pupil is asked to explain why he/she gave a particular answer).

Q 34P Pupils are asked to evaluate their peers' responses to questions

Q 35 P Pupils can explain to others what they are learning

Q 36P Pupils are asked to explain why they are undertaking particular tasks

Q. 37 Questioning and Classroom Discussion: Pupils are asked to explain why they are undertaking particular tasks (e.g., the teacher might ask, "Why are we completing this worksheet/what are we learning by doing it"?).

T q.38 Feedback to pupils is focused on the original learning intention(s) and success criteria

T Q 39. Assessment techniques are used during lessons to help the teacher determine how well pupils understand what is being taught

T Q. 40 Written feedback goes beyond the use of grades and comments such as "well done"

T Q 41 Teacher's praise of pupils is deliberately specific about the nature of the progress e.g. this paragraph really helps me visualise the characters.

T Q. 42Teacher made tests are used diagnostically to identify difficulties and identify strengths and needs in teaching and learning e.g. common mistakes in the teaching of fractions

T Q. 43 Diagnostic information from standardised tests is used to identify strengths and needs in teaching and learning.

P Q. 44 pupils are involved formally in providing information about their learning to parents / guardians e.g. through portfolios or learning logs taken home.

T Q. 45 Feedback focuses on one or two specified areas for improvement at any one time e.g. in written work punctuation errors will not be marked if the focus is adjectives.

T Q. 46 Closing-the-gap-feedback is used to focus pupils' attention on the next step in their learning

T Q. 47 When providing feedback, the teacher goes beyond giving pupils the correct answer and uses a variety of prompts to help them progress

T Q. 48 In preparing to provide pupils with feedback on their learning, the teacher consults their records of achievement against key learning intentions from previous lessons

T Q. 49 Pupils are provided with information on their learning on a minute-by-minute, day-by-day basis rather than end of week/month/term.

Q. 50 Peer- and Self-Assessment: Pupils are given an opportunity to indicate how challenging they anticipate the learning will be at the beginning of a lesson or activity (e.g., by using traffic lights).

P Q 51. Pupils are encouraged to record their progress using, for example, learning logs.

P Q. 52. Lessons on new topics begin with pupils being invited to reflect on their prior learning

P Q. 53. Pupils are provided with opportunities to reflect on, and talk about, their learning, progress and goals

P Q. 54. Pupils assess and comment on each other's work

P Q. 55 pupils are encouraged to use a range of assessment techniques to review their own learning e.g. rubric, traffic lights, thumbs up.

P Q. 56. Time is set aside during lessons to allow for self- and peer-assessment.

P Q. 57 Assessment techniques are used to create an environment in which pupils can be honest about areas where they are experiencing difficulty

P Q 58 When pupils have difficulty in their learning they are encouraged to draw on a range of self-assessment strategies and techniques to overcome the problem e.g. an exemplar on the bulletin board.

P Q. 59 Pupils use each other as resources for learning

P Q. 60 Time is set aside during parent/guardian-teacher meetings for pupils to be involved in reporting on some aspects of their learning

P Q. 61 Pupils use differentiated success criteria to self- and/or peer-assess

P Q. 62. Pupils have ready access to exemplar materials showing work at various levels of achievement across a range of subject areas

Q. 63 My Learning Before Commencing Teaching: How would you describe what you learned about Assessment in college?

Excellent, I knew what to do when I started teaching

Useful, but I was not fully prepared for the classroom

Not relevant to my teaching situation, I was not prepared

Do not remember

Did not have any Assessment Module

Q. 64 Based on the questions you have just answered, is there anything you have been doing but did not realise it was assessment?

Q. 65 Based on the descriptors of Assessment in the questionnaire what changes do you think you will make in your classroom practice?

Q. 66 What Assessment information do you report to parents?

Portfolios

Teacher Designed Test Result

Information Gathered from Formative Assessment e.g. self-assessment, peer-assessment or questioning, learning logs

Standardised Test Results

Work Samples

Q. 67 What Assessment information is considered the most important by parents with 1 being the most important to 6 being the least important?

Portfolios

Portfolios with Feedback

Teacher Designed Test Results

Standardised Test Results

Formative Assessment Information from Self-Assessment, Peer-Assessment, Questioning, Work Samples

Q. 68 What Assessment information is considered important by your colleagues?

Q. 69 What Assessment information do you consider as important and why?

Appendix B Intentional Design Process Task List (Ray, 2006; 2015)

Task Number	Task Purpose	Instructional Method
1	To present content knowledge, pedagogical knowledge related to the professional development topic	Presentation (Interactive whole group experience with mandatory attendance
2	To scaffold the teachers' reflection-for-action responses to identify individual needs in relation to the knowledge presented in Task 1	Office Hours (teacher educator and in-service teachers gather in a central location after school hours; 60-minute duration)
3	To answer any questions that the in-service teachers have as they apply the knowledge	Section (Self-selected group based on comfort level with new material; conversational flow directed by the learner with other teachers and the teacher educator: 90-minute duration)
4	To structure the in-service teachers' self-assessment of their abilities to understand and use the content thus far	Office Hours
5	To guide the in-service teachers as they create a process monitoring plan that measures the effectiveness of the assessment plan, instructional plan and knowledge integration.	Section
6	To guide in-service teachers as they apply the content and pedagogical knowledge for specific lesson planning purposes	Section
7	To structure the in-service teachers' emotional responses to the professional development	Office Hours
8	To guide the in-service teacher as they review the effectiveness of the assessment, instructional and implementation during implementation	Walkthrough (One-on-one set-up where the teacher educator walks the in-service teacher through the problem-solving process; e-mail and online meeting can be used)
9	To guide the experimentation phase based on data collected during implementation	Section
10	To structure self-assessment of their overall emotion to continue PD	Office Hours
11	To guide review of accuracy of predication thereby determining the extent to which they are correct in their understanding of the content	Walkthrough
12	To answer any remaining questions that in-service teachers have as a result of examining predictions	Section

Appendix C Reflective Questionnaire 2

1. My Professional Learning: Describe how you learned best during this course.
2. Instructional Approaches: Which of the following instructional approaches and resources best support your learning. Select all that apply.
Facilitator-researcher-led Presentation
Learning Journal Entries
End of Module Assignments
Power Point Slides
Evaluation of Classroom Practice Survey
Reflective Questions
Group Discussion
Planning for Future Classroom Lessons
Formative Feedback from Facilitator-researcher
Video Clips of Assessment Practice
Research Articles on Assessment
Discussion of Articles
Reflection on Articles
Quizzes
3. How did the approaches you mentioned above help you learn?
4. Skill Development: What aspects of this course have helped you develop your skills in assessment?
5. Further Learning: Rate your need for additional professional development in the following assessment approaches with 1 being Low Need and 5 being High Need
Questioning
Providing Feedback to Students
Peer-Assessment
Self-Assessment
Sharing Learning Intentions
Developing Success Criteria
Evaluating my Assessment Practice as a Teacher
Standardised Testing
Assessing Reading
Assessing oral Language
Assessing Writing
Assessment in other subjects specify
Using Rubrics
Mentoring another teacher in AfL
Talking to parents about AfL
Explaining AfL to your staff
6. Challenges: What challenges if any do you anticipate in implementing any new learning from this course?
Describe the new learning, the challenges and how you might deal with the challenges.
7. New Learning: How can you as a teacher demonstrate new learning in assessment in your classroom?
8. Change in Beliefs: Have your beliefs or thinking about assessment approaches changed after this course?
If so describe what activity, task or resource resulted in this change?
9. Change in School: Do you think you can bring about any change in your school in the area of Assessment?
If so describe how this could happen and refer to anything on the course that might help with change.
10. Parents: Do you think anything on this course could have any impact on how parents view assessment?
Elaborate
11. Following this course I am able to provide a range of assessment information to parents other than standardised test results
Yes, confidently
Yes, but with support.
No

12. I can talk to parents about other assessment methods.
Yes with confidence
Yes, if I learn a bit more
No
13. Confidence: Following this course select any area in which your confidence has increased.
Assessing oral language using AfL
Reporting assessment information to parents other than standardised test results
Changing the assessment practices in my school
Changing assessment practices in my classroom
Assessing Reading using AfL
Changing how students view assessment practices
Providing Feedback to Progress Learning
Asking probing questions
Student Self-Assessment
Assessing Writing using AfL
Explaining AfL to a colleague
Mentoring a NQT in AfL
Using Success Criteria
Teaching your staff about

14. Before this course I thought assessment was about ......
    After the course I think assessment is about ...
15. What aspects of the course have resulted in a change in thinking?
16. Describe any way in which the survey with descriptors of assessment in the classroom helped you learn.
17. Describe any way in which the discussion forum helped you learn.
18. Describe any way in which the assignments helped you learn.
19. Did responding to the reading about assessment help you learn? If so how did it help you learn?
20. Is planning for teaching useful to your learning as a teacher?
If it is explained how.
21. Do you learn from watching video clips?
If so describe the learning.
22. Does the Learning Journal help your learning? If so how does it support your learning?
23. Do the facilitator led presentations help you learn? If so how do they help?
24. Do the podcasts from recognised experts help your learning if so how?
25. Which three instructional approaches used during this course do you think supported your learning the best and why?
26. Are there any instructional approaches not used on this course that you think would have better supported your learning?

Appendix D Reflective Questionnaire 3

Course Impact

1. Describe the impact of doing the summer course for you personally.

Answer:

2. On a professional level describe any impact.

Answer:

3. Describe the impact for your pupils.

Answer:

4. Describe the impact on your school.

Answer:

Assessment Practice: Describe any change in the following areas.
1. Sharing Learning Intentions:
2. Drawing Up Success Criteria:
3. Feedback:
4. Self-Assessment
5. Peer-Assessment

Provide a Diary Entry of Your Use of Assessment during a Typical Day. Include your own thoughts and reactions to your assessment practice.

Provide any Evidence of Implementing Teacher learning from the course e.g. work sample, video clip, audio clip, student reaction, colleague observation etc.

Appendix E Reflective Writing Prompts

The purpose of this reflection is to demonstrate your learning. Reflection also helps you to connect your new learning to your professional working environment and experience of assessment. Reflection helps to elicit your thinking about ideas presented in the text.

Use the questions below, write a reflection on each article.

1. What is the main point of the reading?
2. What is the purpose, impact or theoretical framework of the reading?
3. What stands out to me?
4. What are the current ideas presented to me?
5. What do I know already about the ideas presented?
6. Where has this knowledge come from?
7. How does the text challenge or reinforce my existing beliefs about assessment?
8. How does the text help me better understand assessment?

Appendix F Researcher Fieldnotes Extracts

30th June 2016 Sample of Researcher Fieldnotes
Participants have between three and eight years teaching experience and said they were doing things they did not realise were formative assessment. The teacher taking the EAL class and LS really under rated the work they were doing saying that they would be doing proper classroom assessment next year when they would be in the classroom.
I asked them to describe what they did with their students.
One described carrying out assessments to see what level of English the student had and then using them I am using that to organise the lessons.
I said that is a really good example of formative assessment because you gathered information, used it to make decisions to plan for the next stage of learning. There was a look of surprise on the face of the teacher when I said this. It is surprising to me how this type of teaching is undervalued and perhaps not regarded as "proper teaching".
I only ever did check lists and did not really know why I was didn't know that I was supposed to use the information from the lists to plan stuff. This comment showed how the participant had a really underdeveloped idea of assessment and seemed to be complying to the idea that they should be doing assessment but had no explicit conceptualisation of what was actually needed
I asked the students if they had used learning logs -Reply: "I did the learning logs" I then asked "- Did you give them time to deal with the gaps in their learning - No not really I didn't have the time."
The pens all came out and participants started writing eagerly when I said you had to give the pupil the chance to implement the changes and re-present the completed work. Otherwise it is not formative assessment "Will you be doing that?" (Sort of sarcastically from one participant to me referring to assignment)
Big laugh from the group so much as to say that sort of stuff is impossible in reality.
I said the feedback from this assignment has to be used in your thesis.
I wondered …. Should I give a student the chance to re-submit the work? This challenged me personally as I am not sure how externs view this. But I will be allowing students to resubmit in the online tasks to demonstrate improvement in response to feedback

Students were more engaged when I asked "what technique am I using?" and "why?" liked being able to deconstruct and comment on the modelling of questioning

July 1st Researcher Fieldnotes
There is no specification about the amount of time spent in synchronous or asynchronous contact. I know from previous experience as an online student this can mean just listening to presentations and logging on for ten hours. I know that as part of other courses I was required to respond to the content

and engage by writing a response. I learned more that way and retained more of the content.

From my own experience as an adult learner I recall a course where prior reading and written reflection were part of the course content. Many of the participants objected to this and found it difficult to complete. However, I wondered why we were asked to complete the task. Only later did I come across the term cognitive dissonance and the importance of being presented with new ideas to help you reflect upon your current practice. I realised as a teacher educator the importance of explaining and offering commentary on my practice to my students in order for them to better understand the purpose of activities.

July 4th Researcher Fieldnotes
Students are beginning to engage with the course content and submit the posts on summative and formative assessment. This is just a knowledge exercise, students are not required to relate the information to their own practice. This is a task where I can assess teacher knowledge of assessment at a basic level I use this to pick up on faulty thinking or argument e.g. one student comments that the results of standardised tests are of no great benefit to student learning. Even though the definition of summative assessment given is correct this last phrase prompts me to take note and use this later. I am aware of the need to be responsive as a teacher educator. Even though the task is straight forward and I have no real idea of whether the knowledge was picked up during the task or was there before hand I am assessing the knowledge. I also notice the variety in the length of the responses. I also notice that although students understand the terms little or no supplementary information about strategies is supplied. I think that some students may not have listened to the podcast. I need to ask more specific questions perhaps. I also think this task allows the students to get used to the interface on the course and focus on the content rather than IT

July 5th: Researcher Fieldnotes
The variation in the posts for the writing tsk relating to planning for the most part demonstrated engagement but there is one participant that needs prompting and evidence of previous contributions. I think I should have given clearer success criteria. Some participants did not demonstrate engagement with new material for planning and relied on existing routines and resources

July 7th Researcher Fieldnotes
Teachers raised the issue of multiple choice questions during the standardised testing postings. They commented that students perhaps guessed the answers and it was difficult to assess the student learning. Teachers said that a correct answer in a multiple choice question was not always an accurate reflection of learning. I was reluctant as course tutor to use multiple choice questioning as there was no discussion involved. In a classroom environment discussion and justification can form part of the multiple-choice questions. Using a quiz format where a definition of a term is required caused difficulty because the wording needed to be absolutely exact in order for the answer to be marked correct. This created frustration among students even though this was explained beforehand. Students were

asked to mark the activity as complete if their answer corresponded to the content and they were satisfied they had submitted a correct response.

I thought it was interesting that teachers wanted the test answers to be right or wrong without any judgement used to evaluate their answer.

Module 2 Specific Strategies for Formative Assessment

Not available unless:

- The activity **Task 1a: My Learning and Assessment Practices: An Evaluation Questionaire** is marked complete
- The activity **Task 1b: Module 1 Assignment Overview of Formative Assessment** is marked complete
- The activity **Task 1c: Assessment Journal Module 1 (Assessment Overview)** is marked complete

Your progress ⑦

☐ Module 2 Learning Objectives

☐ Module 2 Presentation

☐ Working Inside the Black Box

☐ Task 2a: Article Response

☐ Assessment in the Primary School Curriculum: Guidelines for Schools Section 2

☐ Formative Feedback

☐ AfL Strategies

☐ Assessment for Learning Checklist

☐ Teacher Reflection Tool

☐ Shirley Clarke - Formative Assessment

☐ Generating Rubrics for Self and Peer-Assessment

☐ Task 2b: Assignment Module 2: Formative Assessment Strategies

1. Name the five broad approaches that make up formative assessment.

2. Select two of these approaches and describe classroom strategies that can be used to implement these two approaches. (200 words)

3. How does this compare to your current practice?

☐ Task 2c: Assessment Journal Module 2

☐ Task 2d: Assessment Quiz

299

Module 3 Assessment of Writing

Not available unless:
- The activity **Task 2a: Article Response** is marked complete
- The activity **Task 2a: Article Response** is marked complete
- The activity **Task 2c: Assessment Journal Module 2** is marked complete
- The activity **Task 2d: Assessment Quiz** is marked complete

Your progress ⑦

Module 3 Learning Objectives	☐
Presentation Module 3	☐
Writing Conference	☑
How Will We Know What Excellence looks Like?	☐
Feedback for Writing	☐
Writing Rubric	☐
Shirley Clarke Unlocking Formative Feedback	☐
Drumcondra Writing Indicators	☐
Primary Language Curriculum	☐
Task 3a: Module 3 Assignment: Assessing Writing in the Classroom	☐

Assessing Writing in the Primary

Choose a class level and a writing genre. Outline how you as a teacher would draw up success criteria for a writing lesson. Refer to learning outcomes for your pupils.

Task 3b: Forum Module 3 Assessment of Writing	☐
Task 3c: Assessment Journal Module 3 (Writing)	☐

Module 4 Assessing Oral language

Your progress ⑦

Module 4 Learning Objectives	☐
Teaching and Assessing Oral Language	⬚
Drumcondra Indicators Assessing Oral language	☐
The Use of Bloom's Taxonomy	☐
Bloom's Taxonomy of Verbs for Devising Learning Tasks	☐
Using Peer Assessment	☐
Primary Language Curriculum	☐
Video Clip How to Assess Oral Language using an Oral Language Record	☐
Task 4a: Assingnment Module 4: Assessing Oral Language in the Classroom	⬚

Assessing Oral language in the Primary Classroom.

Using either The Drumcondra Oral Language Indicators of The New Primary Language Curriculum choose three learning outcomes for your class level. Indicate how you will gather data to establish current learning, how you can plan for future learning and how you can assess new learning.

Task 4b: Assessing Oral Language Forum Posting Required	☐
Task 4c: Assessment Journal Module 4 (Oral Language)	☐

Module 5 Formative Assessment in Reading

Not available unless:
- The activity **Task 4a: Assingnment Module 4: Assessing Oral Language in the Classroom** is marked complete
- The activity **Task 4b: Assessing Oral Language Forum Posting Required** is marked complete
- The activity **Task 4c: Assessment Journal Module 4 (Oral Language)** is marked complete

Your progress ⑦

☑ Assessing Reading

☑ Assessing Reading - Self assessment Peer assessment

☐ Reading and Self-Assessment Demonstration

☐ How to Use Bloom's Taxonomy to Assess Reading

☐ Learning Actions based on Bloom's Taxonomy

☐ Drumcondra Reading Indicators

☐ Using Standardised Test Data to Plan Learning

☐ One Minute Fluency Probe

☐ Task 5a: Assignment Module 5 Assessing Reading

Choose a class level. In about two hundred words indicate how you would implement sharing the learning intention, self-assessment and peer-assessment in a reading lesson. Refer to strategies you would use and describe how as a teacher / educational leader would prepare your class, gather assessment data and proceed to use the data to progress learning. Refer to learning outcomes.

☑ Task 5b: Assessment of Reading

☐ Task 5c: Assessment Journal Module 5 (Reading)

☐ Task 5d: Reflection: My Learning in Assessment as a Teacher

Appendix H Item Categories for Scales

Learning Intentions and Success Criteria

Q. 8T Learning intentions are shared with pupils at appropriate times during lessons (e.g., Halfway through the lesson, the teacher might say: "Remember, we are learning to distinguish between 2D an

Q9 T Learning intentions are stated using words that emphasise knowledge, skills, concepts and/or attitudes i.e., what the pupils are learning NOT what they are doing.

Q10T Pupils are reminded about the links between what they are learning and the big learning picture

Q 11 P Pupils are provided with opportunities to internalise learning intentions by, for example, being invited to read them aloud and/or restate them in their own words.

Q 12 T Child friendly language is used to share learning intentions with pupils eg we are learning to make a good guess (prediction) about what is going to happen in the story.

Q 13 T Success criteria relating to learning intentions are differentiated and shared with pupils.

Q 14 P Samples of work are used to help pupils develop "a nose for quality".

Q 15 T Assessment techniques are used to assess pupils' prior learning (e.g., concept mapping…).

Q 16 T Pupils are reminded of the learning intentions during lessons.

Q 17 P Learning intentions are available throughout lessons in a manner that is accessible and meaningful for all pupils (e.g., written on the black/whiteboard and/or in pictorial form for junior classes).

Q 18 T Pupils' progress against key learning intentions is noted and/or recorded as part of lessons

Q 19P Pupils demonstrate that they are using learning intentions and/or success criteria while they are working

Q 20 P Pupils are given responsibility for checking their own learning against the success criteria of lessons.

Questioning

Q 21T When planning lessons, key, open-ended questions are identified to ensure that pupils engage actively in lessons

Q 22 T Assessment techniques are used to facilitate class discussion (e.g., brainstorming)

Q 23 Questions are used to elicit pupils' prior knowledge on a topic.

Q 24 During lessons, hinge questions are used to determine pupils' progress in lessons

Q 25T Assessment techniques are used to activate pupils /get them thinking during discussions and/or questioning

Q 26 T Assessment techniques are used that encourage all pupils to engage with questions eg no hands up, names out of a hat

Q 27 P Assessment techniques are used to encourage questioning of the teacher by pupils (e.g., using hot-seating or a Post-Its challenge).

Q 28T Questioning goes beyond one right answer style

Q 29T The pace of discussion is slowed down and pupils are encouraged to think before responding eg wait time.

Q 30 Pupils are asked to explore their own ideas with others, using think-pairshare, for example.

Q 31 P Pupils are encouraged to share the questioning role with the pupil ie teacher routinely invites pupils to question their peers' contribution to discussion.

Q 32P Individual answers to questions are supplemented by pupils taking an answer round the class so that a selection of responses from the pupils is used to build a better answer.

Q 33T Pupils' incorrect responses are used to guide teaching and learning (e.g., a pupil is asked to explain why he/she gave a particular answer).

Q 34P Pupils are asked to evaluate their peers' responses to questions

Q 35 P Pupils can explain to others what they are learning

Q 36P Pupils are asked to explain why they are undertaking particular tasks

Feedback

T q.38 Feedback to pupils is focused on the original learning intention(s) and success criteria

T Q 39. Assessment techniques are used during lessons to help the teacher determine how well pupils understand what is being taught

T Q. 40 Written feedback goes beyond the use of grades and comments such as "well done"

T Q 41 Teacher's praise of pupils is deliberately specific about the nature of the progress eg this paragraph really helps me visualise the characters.

T Q. 42Teacher made tests are used diagnostically to identify difficulties and identify strengths and needs in teaching and learning eg common mistakes in the teaching of fr

T Q. 43 Diagnostic information from standardised tests is used to identify strengths and needs in teaching and learning.

P Q. 44 pupils are involved formally in providing information about their learning to parents / guardians eg through portfolios or learning logs taken home.

T Q. 45 Feedback focuses on one or two specified areas for improvement at any one time eg in written work punctuation errors will not be marked if the focus is adjective

T Q. 46 Closing-the-gap-feedback is used to focus pupils' attention on the next step in their learning

T Q. 47 When providing feedback, the teacher goes beyond giving pupils the correct answer and uses a variety of prompts to help them progress

T Q. 48 In preparing to provide pupils with feedback on their learning, the teacher consults their records of achievement against key learning intentions from previous lesso

T Q. 49 Pupils are provided with information on their learning on a minute-by-minute, day-by-day basis rather than end of week/month/term.

Peer- and Self-Assessment

Peer and Self-Assessment

P Q 51. Pupils are encouraged to record their progress using, for example, learning logs.

P Q. 52. Lessons on new topics begin with pupils being invited to reflect on their prior learning

P Q. 53. Pupils are provided with opportunities to reflect on, and talk about, their learning, progress and goals

P Q. 54. Pupils assess and comment on each other's work

P Q. 55 pupils are encouraged to use a range of assessment techniques to review their own learning eg rubric, traffic lights, thumbs up.

P Q. 56. Time is set aside during lessons to allow for self- and peer-assessment.

P Q. 57 Assessment techniques are used to create an environment in which pupils can be honest about areas where they are experiencing difficulty

P Q 58 When pupils have difficulty in their learning they are encouraged to draw on a range of self-assessment strategies and techniques to overcome the problem eg an exemplar on

P Q. 59 Pupils use each other as resources for learning

P Q. 60 Time is set aside during parent/guardian-teacher meetings for pupils to be involved in reporting on some aspects of their learning

P Q. 61 Pupils use differentiated success criteria to self- and/or peer-assess

P Q. 62. Pupils have ready access to exemplar materials showing work at different levels of achievement across a range of subject areas
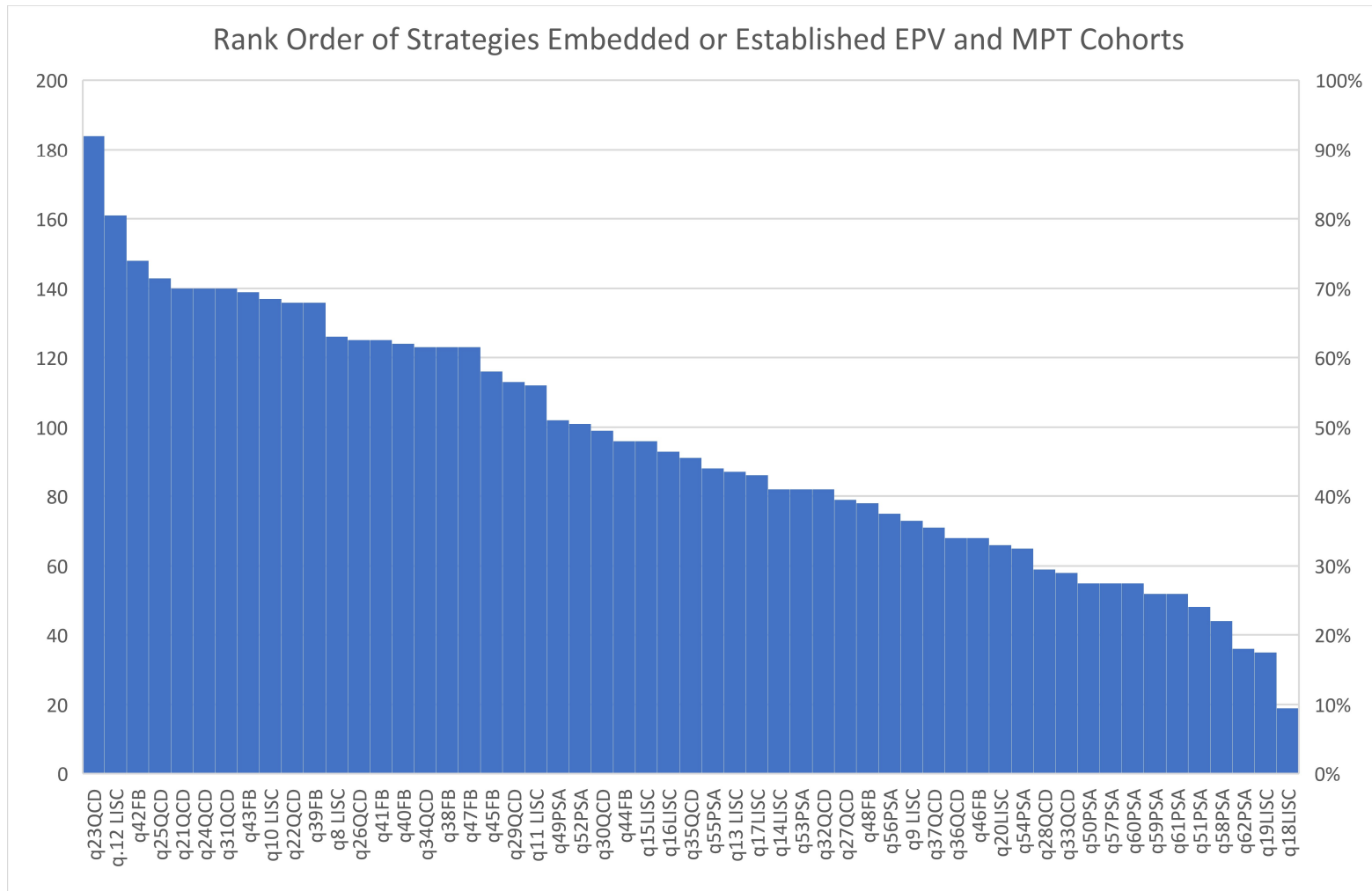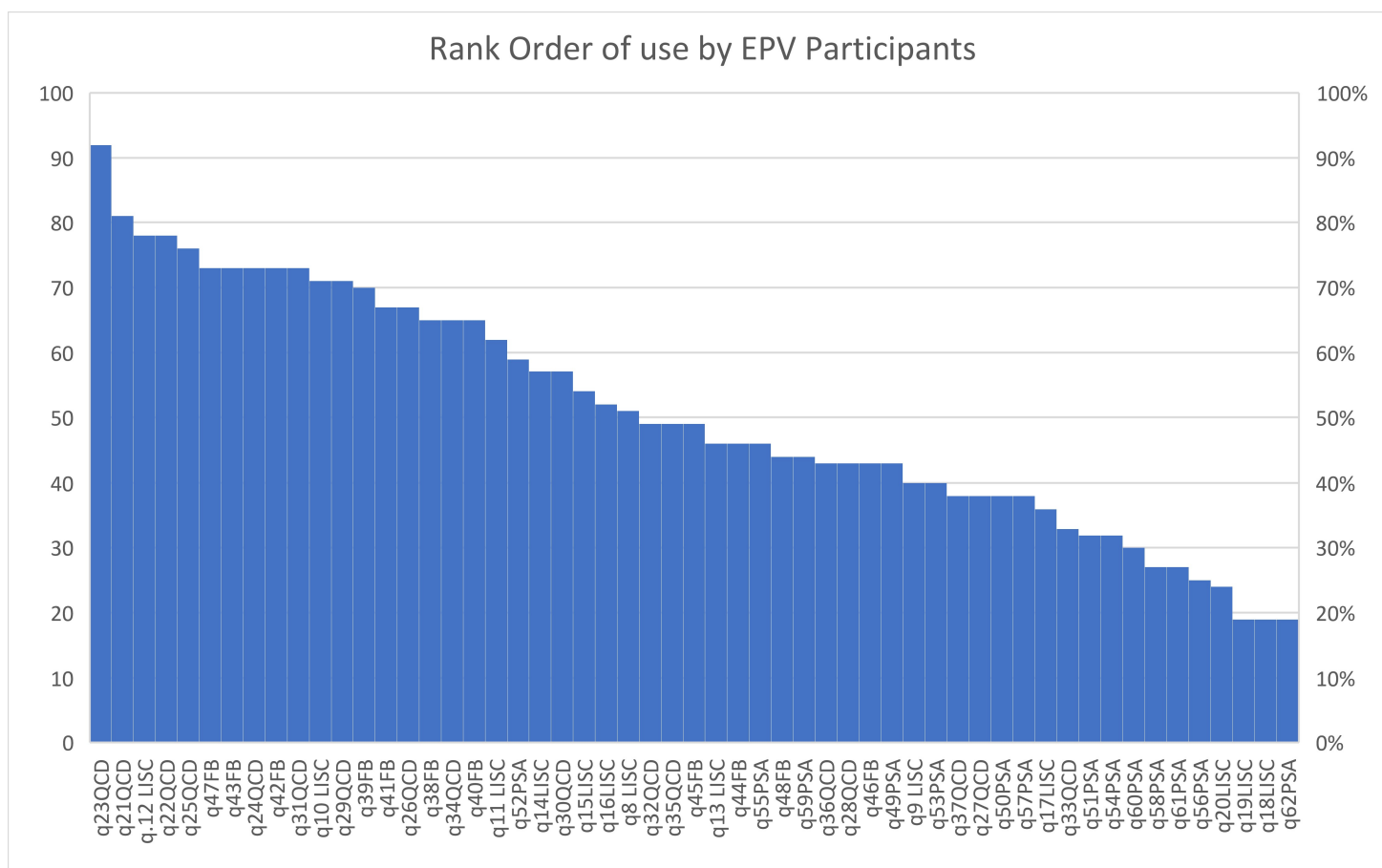
Appendix I Table of Overall Use of Strategies

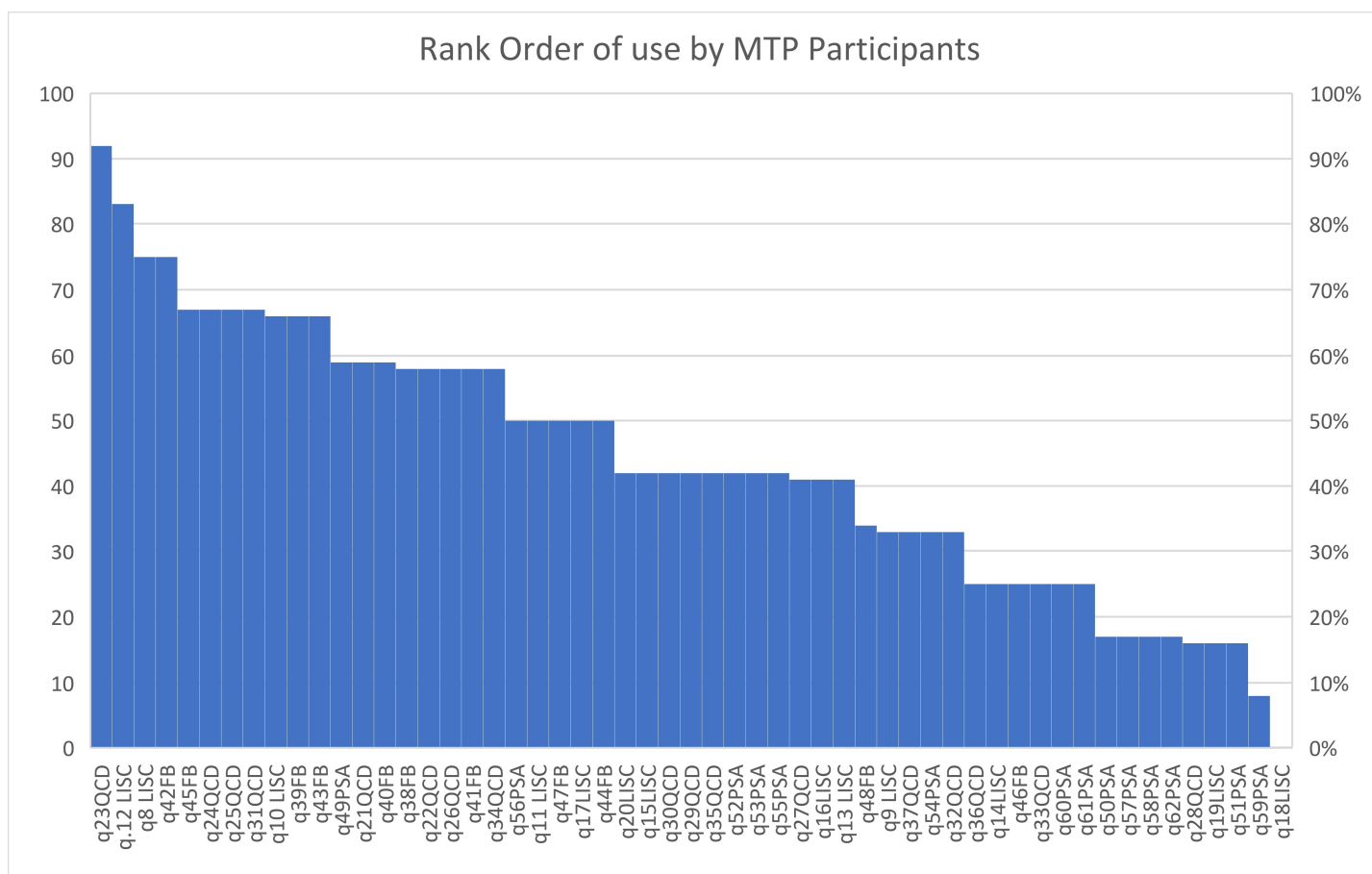| EPVQ	Embedd	Establis	Total	Emergi	Spora	Neve	Do not U	MTQ	Embedd	Establis	Emergi	Spora	Neve	Emb+E
q8	16	35	51	38	11	0		q8	25	50	17	8	0	75
q9	16	24	40	38	22			q9	8	25	50	17	0	33
q10	30	41	71	19	8	3		q10	33	33	17	17	0	66
q11	24	38	62	16	22	0		q11	17	33	17	25	8	50
q.12	54	24	78	16	5	0		q.12	33	50	8	8	0	83
q13	14	32	46	38	16	0		q13	8	33	33	25	0	41
q14	22	35	57	30	11	3		q14	17	8	25	42	8	25
q15	19	35	54	30	16	0		q15	17	25	42	17	0	42
q16	11	41	52	35	14	0		q16	8	33	33	25	0	41
q17	22	14	36	32	24	8		q17	33	17	42	0	8	50
q18	14	5	19	43	32	5		q18	0	0	50	25	17	0
q19	3	16	19	51	27	3		q19	8	8	50	8	25	16
q20	5	19	24	41	27	8		q20	25	17	33	8	17	42
q21	35	46	81	16	3	0		q21	42	17	25	17		59
q22	43	35	78	19	0	3		q22	50	8	33	0	8	58
q23	65	27	92	8	0	0		q23	67	25	8	0	0	92
q24	32	41	73	19	8	0		q24	25	42	33	0	0	67
q25	35	41	76	16	5	3		q25	25	42	33	0	0	67
q26	24	43	67	22	11	0		q26	50	8	17	25	0	58
q27	8	30	38	35	24	3		q27	8	33	17	33	8	41
q28	11	32	43	16	35	5		q28	8	8	33	25	25	16
q29	30	41	71	14	14	3		q29	0	42	42	17	0	42
q30	16	41	57	35	3	5		q30	0	42	25	25	8	42
q31	32	41	73	19	8	0		q31	17	50	8	25	0	67
q32	14	35	49	27	24	5		q32	0	33	42	25	0	33
q33	11	22	33	38	16	14		q33	8	17	8	33	33	25
q34	16	49	65	32	3	0		q34	25	33	42	0	0	58
q35	8	41	49	35	8	8		q35	17	25	25	33	0	42
q36	5	38	43	46	11	0		q36	8	17	50	25	0	25
q37	3	35	38	35	24	3		q37	8	25	33	33	0	33
q38	27	38	65	32	0	3		q38	25	33	25	17	0	58
q39	24	46	70	16	14	0		q39	33	33	17	17	0	66
q40	35	30	65	22	11	3		q40	42	17	25	8	8	59
q41	35	32	67	30	3	0		q41	33	25	42	0	0	58
q42	35	38	73	24	3	0		q42	33	42	17	0	8	75
q43	46	27	73	22	5	0		q43	33	33	25	8	0	66
q44	22	24	46	24	16	14		q44	17	33	17	0	33	50
q45	22	27	49	27	19	5		q45	25	42	8	8	17	67
q46	11	32	43	24	16	0	16	q46	8	17	33	33	0	25
q47	32	41	73	22	5	0		q47	17	33	33	17	0	50
q48	14	30	44	24	22	11		q48	17	17	8	42	17	34
q49	16	27	43	35	22	0		q49	17	42	8	25	8	59
q50	3	35	38	14	24	24		q50	0	17	17	50	17	17
q51	5	27	32	27	19	22		q51	8	8	25	8	50	16
q52	24	35	59	30	5	5		q52	25	17	50	8	0	42
q53	16	24	40	35	24	0		q53	17	25	50	8	0	42
q54	16	16	32	30	27	11		q54	0	33	42	17	8	33
q55	16	30	46	30	19	5		q55	25	17	33	25	0	42
q56	11	14	25	35	35	5		q56	25	25	42	8	0	50
q57	16	22	38	24	24	14		q57	0	17	50	25	8	17
q58	5	22	27	38	19	14	3	q58	0	17	33	17	33	17
q59	14	30	44	24	24	8		q59	0	8	58	25	8	8
q60	8	22	30	16	11	43		q60	17	8	0	17	58	25
q61	5	22	27	30	19	22	3	q61	0	25	17	42	17	25
q62	8	11	19	30	27	24		q62	0	17	0	33	50	17
	1104	1699		1524	845	315			1007	1400	1566	999	505	

Appendix J Table of Mean Scores for Each Scale

Four Scales of Classroom Assessment Mean of Each Cohort	1=Embedded	2=Established	3= Emerging	4= Sporadic	5=Emerging

Scale: Learning Intentions and Success Critia

Q	Q08_Shari	Q09_Learr	Q10_LI 3	Q11_Resta	Q12_Child	Q13_Succe	Q14_Work	Q15_Prior	Q16_Durin	Q17_LI Av	Q18_Learr	Q19_Pupil	Q.20	Mean
EPV	2.43	2.65	2.14	2.35	1.73	2.57	2.38	2.43	2.51	2.84	3.11	3.11	3.14	2.57
MTP	2.08	2.75	2.17	2.75	1.92	2.75	3.17	2.58	2.75	2.33	3.83	3.33	2.75	2.71
Differenc	0.35	0.10	0.03	0.40	0.19	0.18	0.79	-0.15	-0.24	0.50	-0.73	-0.23	0.39	2.64

Scale: Questioning and Classroom Discussion

Q	Q21_Open	Q22_Discu	Q23_Elicit	Q24_Hinge	Q25_Think	Q26_No h	Q27_Pupil	Q28_Ques	Q29_Open	Q30_Ques	Q31_Explc	Q32_Share	Q33_Build	Q34_Incor	Q35_Evalu	Q36_Expla	Q37_Expla	Mean
EPV	1.86	1.84	1.43	2.03	2.00	2.19	2.84	2.92	2.22	2.41	2.03	2.78	3.00	2.22	2.68	2.62	2.89	2.35
MTP	2.17	2.08	1.42	2.08	2.08	2.17	3.00	3.50	2.75	3.00	2.42	2.92	3.67	2.17	2.75	2.92	2.92	2.59
Differenc	-0.30	-0.25	0.02	-0.06	-0.08	0.02	-0.16	-0.58	-0.53	-0.59	-0.39	-0.13	-0.67	0.05	-0.07	-0.30	-0.02	2.47

Scale: Feedback

Q	Q38_Focu	Q39_Durin	Q40_Beyo	Q41_Speci	Q42_Diagr	Q43_Stand	Q44_Learn	Q45_Focu	Q46_Closi	Q47_Feed	Q48_Feed	Q49_Minu	Mean
EPV	2.14	2.19	2.16	2.00	1.95	1.86	2.76	2.59	3.11	2.00	2.86	2.62	2.35
MTP	2.33	2.17	2.25	2.08	2.08	2.50	2.08	2.08	3.00	2.50	3.25	2.50	2.40
Differenc	-0.20	0.02	-0.09	-0.08	-0.14	-0.64	0.67	0.51	0.11	-0.50	-0.39	-0.12	2.38

Scale: Peer and Self Assessment

Q	Q50_Self A	Q51_learn	Q52_Prior	Q53	Q54	Q55_Revie	Q56_Time	Q57_Hone	Q58_Draw	Q59_Pupil	Q60_Stude	Q61_Diffe	Q62_Exem	Mean
EPV	3.32	3.24	2.32	2.68	3.00	2.68	3.11	2.97	3.22	2.84	3.59	3.38	3.49	3.06
MTP	3.25	2.67	3.67	3.83	2.42	2.50	3.00	2.58	3.08	3.25	3.67	3.33	3.92	3.17
Differenc	0.07	0.58	-1.34	-1.16	0.58	0.18	0.11	0.39	0.13	-0.41	-0.07	0.05	-0.43	3.12

Appendix K Rank Order of Strategies.

Rank Order of Strategies Embedded or Established EPV and MPT Cohorts

Rank Order of use by EPV Participants

Rank Order of use by MTP Participants

Appendix L Participant Contributions Demonstrating Learning

SCQM1Q65: A lot... Mainly around pupil self-assessment. I will start with one subject area in September with lesson learning intention and criteria for success. Although I have always written learning objectives for each lesson on the board and ticked them off at the end of a lesson, this has not asked pupils to assess their own achievement of the objectives themselves. Also, I had learned already to randomly select pupils for whole class questioning and I have often asked pairs to discuss answers to questions before feedback. However, now I will focus more on slowing this process down by discussing answers at length within groups and possibly turning this into pupils questioning each other/ teacher.

SCQM1Q65: I really need to focus more on pupil self-evaluation. I don't dedicate enough time in my lesson to this element of teaching. Also, peer assessment is another element I need to incorporate more into my lessons.

Appendix M External Inspection Report

Inspection Report
Introduction

Assessment for Learning in English Literacy is intended to provide teachers with an insight on the value/theory/variety and practicalities aligned with assessment for learning strategies within the context of English Literacy in Irish primary classrooms.

Findings

The overall quality of this course is good.

Course content is commendable. Five modules were set out covering course objectives reflective of the English Literacy programmes in schools. These were sub-divided into a range of learning materials, none of which were too onerous for participants. Rather these materials offered key learning points for progression to the assignment section within each module aimed to improve teacher's capacity to enhance the oral, reading writing skills of pupils. The concurrent chats, fora and access to administration personnel enabled learners to complete, appropriately-sized written responses to the course expectations. The content was appropriately focused on the various elements within assessment theory but did not sufficiently highlight the strategies required to ensure that individual teachers could develop the necessary time management skills within lessons to assess for learning.   The participant learner experience is effective. Most participants engaged professionally and earnestly in their learning. They understood course content to a varied degree, on occasion, but through persistent course management and attention to the postings of their co-learners they were able to be more specific in their planning and open to new approaches as a result of this course. Participants had access to video/power-point presentations/academic articles/discussion fora/administrative support. Occasionally, submissions were late or not submitted and a few participants did not sufficiently avail of the fora for the learning that was available therein. This resulted in less than satisfactory responses to the set assignments and some generic learning recording and reflection. This was particularly evident when a small number of participants could not select appropriate learning objectives for oral language plans or when confusion arose on how to differentiate and subsequently assess English writing experiences for senior pupils.   Course Management and Reflection of National Priorities is very good. The course reflected key national priorities for primary teachers to understand the importance of assessment in language and literacy contexts. Appropriate reference was made to the Primary Language Curriculum and how this can be best utilised by a teacher to know what is being taught and assessed. The Course Director was consistently available to provide practical and academic support for individual participants. Most participants benefitted from her expertise in the completion of assignment and effective work was seen in progressing live chat for a through content modules to assist the management of this course. All participants were effectively supported and enabled to create their own e-portfolio. The design layout of the modules and the easy access to materials in a modular set-up is very clear for participants. Timings, attendance to the relevant modules and administrative arrangements are maintained professionally.

The main strengths of this summer course
- The course is very well organised, prepared and carried in the nature of learning experiences provided in this online environment - The course organiser is well versed with and expert in the ongoing requirements prevalent in an online learning environment - Responses to learner queries, submissions and participation are prompt and relevant

- Most participants are committed to the learning event and submit their materials in a timely manner - A wide variety of sources are provided that encourage participants to understand the course material being presented.

The following areas require development and improvement
- More individualised attention should be paid to the very few participants who did not complete assignments on time. - - Greater priority should be given to the development of participants' practical classroom management steps required to ensure that each pupil's progress is assessed with equal rigour and consistency.
Date: 29 August 2016

Appendix N: The Learning Journey

Professional Readings and Reflection	Module 1 Audit Instrument, Forum	Module 2 Strategies	Module 3 Writing Forum	Module 4	Module 5	School Follow-Up Data
MTP 1 am No one test tells you everything; made me take more notice of what I did in college; government policy really affects the classroom; I need to be aware of my overreliance on standardised testing; assessment is not just good record keeping; learning theory is really connected with assessment; I like that on-the-spot assessment of Cowie & Bell sounds as though it would be good for Aistear.	MTP 1 Having reflected upon my assessment practices following my completion of the survey, I intend to make a number of changes in my future practice as a teacher. They are as follows; being more specific with feedback using AfL strategies on a daily basis to create a meaningful learning environment i.e. incorporating thumbs up, thumbs down, traffic lights and talk partners to assess children on an on-going basis throughout lessons - sharing learning intentions and success criteria diligently in order to assume embedded practice	I intend to make a number of changes in my future practice as a teacher. They are as follows; - being more specific with feedback - using AfL strategies on a daily basis to create a meaningful learning environment i.e. incorporating thumbs up, thumbs down, traffic lights and talk partners to assess children on an on-going basis throughout lessons	MTP 1 am feeling very inspired by witnessing the implementation of this Writing Conference. I am considering ways in which it could be implemented in the Junior Infant classroom. Perhaps I could use it to discuss letter formation with pupils in the earlier stages of the school year and progress into the construction of CVC words as the year progresses. It would be a good strategy to foster early in their education as it will teach them about accountability for their own work from an early age.	Similar to XXX I had never used the Drumcondra Indicators Assessing Oral Language. The comprehensive manual details the process in a favourable way and I welcomed checklists particularly as they provide a focus for the teacher to assess on. Furthermore, checklists are a quick and easy way to maintain assessment records in place of making anecdotal notes which can be more time consuming. I	My most recent experience of assessing reading has been with the administration of the Primary School Assessment Kit; testing EAL pupils as part of my school's end of year assessment regime. The common errors made on this test can be used to inform next year's planning for the implementation of the EAL curriculum. In this way, these tests form part of the summative assessment process. As well as this, it tests basic word identification skills, sequencing skills and lower order comprehension, deeming it an incomplete summary of pupils' overall reading achievements throughout the year. Having seen AfL strategies in practice via NCCA videos, I now understand how this could be incorporated into any reading lesson in my junior infant classroom. I particularly liked two ideas from the videos, both relating to traffic lighting. One teacher encouraged pupils to use the three colours to differentiate between nouns, adjectives and verbs.	MTP 1 My junior infant pupils are quite good at processing the feedback that I give them during my correction of their work. For example, I might say; I think this is good work, but it would be better if you coloured inside the lines/completed the task faster etc. In the next activity, I have noticed that the pupils might ask; is my colouring better now? or how much time is left? They are aware of what they need to do to achieve success as a result of my detailed feedback. I have noticed that the children mimic my feedback phrases when commenting on one another's work i.e. I like Mary's work because she stayed inside the lines when she was colouring. Drawing Up Success Criteria: This is done orally prior to lesson activities i.e. I say, "Teacher is looking for…"

MTP CB 5Focused revision of written work; the ultimate use of assessment data is to improve student learning; need to move away from the gold star culture; I need to help parents focus on improving the learning rather than interpreting a score; How useless feedback and red marks are without a plan to improve. Hadn't really made the connection between learning theory and assessment even though I did this in college; Standardised testing and behaviourist theory are linked; Planned and unplanned assessment was not something I knew about.	MTP 5Reflecting on my time as an NQT my main concern was ticking the boxes that were necessary as part of the teacher induction process, so although my assessment tools did provide me with information I'm not sure I used this information accurately to give the pupils a chance to improve their learning.	Reflecting on my time as an NQT my main concern was ticking the boxes that were necessary as part of the teacher induction process, so although my assessment tools did provide me with information I'm not sure I used this information accurately to give the pupils a chance to improve their learning. As I became more confident in my abilities I used critical friends to gain awareness on assessment and began using checklists and AfL tools in my infant classroom such as traffic lights. This proved very useful. We also used scrapbooks instead of textbooks in SESE which included photos and work samples of the children learning in History, Geography and Science.	MTP 5This year when teaching writing to my third class I found there was a huge spread in the ability levels. I taught writing using the scheme "pm writing". This was very useful as it provided me with examples of writing in each genre which could be examined and discussed with my class. It had features of writing that were key to each genre which was useful for me for assessment purposes I knew exactly what I should be looking out for in each genre. It is only now from completing module three that I have reflected on the pm writing scheme and seen that they only provided one piece of text for each genre which was of a high standard. I used to go through this sample with the children and pick out the features of each text and this is how we came up with the success criteria or template as I had called it.	MTP 5 I like the idea of using rubrics more when assessing oral language and sharing feedback with the children. We have 16 iPads in school and I would love to put them to better use and get the children recording themselves and self/peer assessing their oral language	MTP 5 I used the class standardised test scores and information from the previous teacher to initially group the pupils into reading/comprehension ability, we then had literacy hour where building bridges of comprehension was my main tool in teaching comprehension. This worked very well and it allowed me to teach the pupils strategies for comprehension in small groups of 10 approx. It also gave me time to listen to the children reading aloud where I could make notes on their pronunciation and fluency. The videos where traffic light self and peer assessment strategies were used were brilliant and a great way to get the children listening to each other and assessing themselves and partners	MTP 5Sharing Learning Intentions: I am now using WILF daily in literacy lessons. I display it clearly on the interactive Whiteboard and I have noticed some of the more able pupils copying it down in their copies (although I have not asked them to, they are in first class.) I am pleased to say the children are now using a traffic light system successfully to self-assess. Each child has 3 faces on a looped string-green happy face, orange straight face and red sad face, the children use these faces to respond during lessons
MTP DC Assessment and learning have to match; Gives me real examples to use	The initial influence on my assessment practice were the assessment modules and workshops with Michael O'Leary during my initial teacher education. Looking back now, it was comprehensive and up to date, and offered a thorough grounding in practices which I now come to realise are not altogether common. I know that sometimes I haven't fully followed through on these strategies and have a few times found myself going through the motions	I know that I utilised many assessment strategies garnered from my initial teacher education in my first few years teaching, such as traffic lights, no hands up questions, talk partners. I have found though the longer I have been teaching, I have been letting some of the strategies fall by the wayside, despite the fact they have worked well. The biggest influence on my assessment practices though has always been the class I have been teaching at any one time. With challenging	Taken altogether, the consistent message is that the manner in which teachers assess their pupil's writing can have significant effect on pupil self-esteem, and we need to ensure best practice in this regard. I am often guilty of, which is a tendency to assess the quantity of work and presentation rather than the quality of learning	I get the idea of the tracker children too, but I just think it leaves things too open for children to fall through the cracks, especially in large classes where there are lots of needs. There needs to be an effective screening process in infants for oral language, but to put one in place, in a large school, would require a lot of co-ordination and leadership. Perhaps the new curriculum will act as a stimulus in this regard.	one of the highest achieving pupils in the class was not a very fluent reader out loud. Yet his comprehension, understanding and synthesis of the pieces he read was always of a high quality. The piece also goes on to make the valid point that in the real world outside the classroom, people rarely read aloud. Studying this course is a case in point - I'm not reading aloud right now, yet I am comprehending and understanding the texts. I should use standardised data more as a gatekeeper	Since the course was linked to my MTeach programme, I felt I invested more of myself in it, and was more determined to make the most of it compared to previous online courses which I had completed. It also boosted my confidence since it affirmed the practice which I had been unconsciously doing. I have had little opportunity so far, this year to implement many of the approaches as I am teaching in language support with infants with little to no English. Many of the

		classes, I have always found that oral feedback during work and at the end of work extremely effective, and with older children, I have made great strides towards putting into place a culture of learning intention sharing, classroom discussion and peer and self-assessment, since that's what I found through trial and error to be the most effective. Yet I know that sometimes I haven't fully followed through on these strategies and have a few times found myself going through the motions.			than an end product - if a child has performed poorly on a standardised test, a tailor-made response following further specific diagnostic testing should be put in place rather than just attending generalised learning support. The Drumcondra English Profiles will definitely improve my practice in the assessment of reading. Having a progressive set of indicators, along with the new language curriculum, will help me set out a step by step approach to teaching and assessing reading. I also need to consider tailoring my own comprehension questions around the main points of a text as suggested in the Drumcondra Profiles, using a common question template around setting, characters, themes, personal responses etc. and just tweaking it for each story	answers below reflect this fact – I am certain that if I were in a mainstream class or LSRT that it would have a much greater impact. The start of the school year is so busy that starting new whole school initiatives would be a challenge; As I mainly work with oral language with infants, there is little opportunity yet to draw up success criteria – although I do model how to speak all the time now.
SC 35 ED n/a	Earlier on in my teaching experience the dynamic of a class would have played a major role in deciding how I assessed key aspects of the curriculum e.g. I have taught mostly in a multi grade setting and a lot of organisation was essential in successful everyday AfL. I wasn't confident in my abilities to present assessment (other than the traditional assessment methods) to my class. I then went into LSRT and the way I assessed changed again. I	approaches that helped me learn the best was in the links provided to get the information. They were tailored towards the specific title of the module. I liked the development of each link as I got through them one by one. A continuum of learning! I now think formative assessment is far more approachable than I once thought. Until this summer course I would have been quite daunted by the idea of formative assessment and I was only really			Firstly, I would refer to supports like the writing indicators for the class level I am teaching and through careful observation of the children during a writing session target two or three indicators that the majority of the children are still working on. Then I would draw on the new language programme to clarify what learning stage the majority of the children are on based on the new language curriculum guidelines (this would probably have been already	It has given me more confidence when talking about assessment with other teachers (especially in interviews. Currently I am working as a substitute teacher and for the most part, I had a slightly vague notion of AFL and would have relied a lot on one or two strategies to define it so to speak. I was personally happy with what I got from the course. When subbing this year so far, I am slightly more aware of my questioning technique and

	was at sea with the diagnostic assessment initially but it didn't take long to really gain a deep insight into how it works and why it is important to use that assessment to inform part of the children with SEN curriculum.	comfortable with certain parts of AoL. Now after reading through module two I realise it can be introduced in a really practical way in small amounts.			clarified). For example, if I was teaching 2nd class on level d I would choose three clear success criteria based on the level the majority of the class are on and differentiate thereafter accordingly. Choosing the writing strand of Exploring and Using, the success criteria for my lesson based on Narrative Writing would include: E.g. 1. I included a clear beginning, middle and end in my writing today. 2. In my final draft I spaced all words correctly and wrote neatly. 3. I discussed with my partner in detail all the interesting parts of my story.	will sometimes pause and include more than one student in an answer
I MTP 3 MD need to work on my questioning; Making the students aware that formative assessment can "count"; Using rewards can be as harmful as using punishments; Children and teachers need examples of success; I did "noticing" but didn't know it was assessment. Dynamic assessment is something I would like to know more about; the seven strategies for formative assessment made me feel I could do this.	Detailed description of reaction to audit instrument.	If I was to pick one way to change my practice and plan for change it would be to introduce WALT, WILF and the traffic light system in my everyday practice. I think making the learning objectives and success criteria explicit to the students requires such a small change on the part of the teacher and can make a huge difference to student learning. This was captured particularly well in the videos of both the fifth-class geography lesson and the infants/first class writing lesson.	I agree XXX- I thought the video was an excellent demonstration of a writing conference. I have some experience of conducting writing conferences in my classroom and in a third/fourth class setting, it works very well.	I have no experience of using the Drumcondra English Profiles. From reading the manual, it appears to be a very thorough way to assess literacy and manages also to integrate formative assessment with summative assessment. I would be interested to hear from anyone who has used the Drumcondra English Profiles,	The Drumcondra English Profiles is a very comprehensive, thorough account of how to assess reading throughout the year. Engaging with this resource enabled me to revise the different phases of reading development (which is something I haven't done since undergraduate study): emergent/pre-alphabetic, partial alphabetic, full alphabetic, consolidated-alphabetic and reading to learn. This is very beneficial to my practice. I have worked in a senior school setting all of my career to date and so can be a little out of touch with teaching the early developmental stages of reading.	the online platform for really suited me, enabling me to access course content at my discretion and engage with material at my own pace. Formative assessment was something I knew I should be doing in practice, however, I continued to rely on standardised scores as the only true evaluation of my teaching and my students' learning. From a theoretical perspective, this course provided a reasonable explanation for such frustration and I came to understand that I was caught in the crossfire between two conflicting schools of thought The children are enjoying being challenged by questions that elicit deep thinking and extend learning, rather than the simple recall questions they had become accustomed to. Every child in the class is challenged to

						participate and share responses through use of whiteboards and talk partners which ensures maximum engagement and offers much broader evidence of learning and whole class understanding. The children are acting on the feedback they receive because I am providing them with information that enables them to move their own learning forward.
SC 31n/a	Our school used the Drumcondra standardised tests. I find them useful for analysing scores to see where pupils may have difficulty in learning. For example: Problem-Solving in Maths, Comprehension in English, Spelling, Phonics. Any pupil who scores below 12th percentile definitely has learning needs and will definitely get Learning Support, to start with, there may be other needs also.	Module 2 has opened up new ideas for my practice. It has introduced new ideas such as 'waiting time' when questioning and the use of a thinking hat - allowing time for the pupils to compose their ideas. This module has made me think about looking towards the pupil more and using them as a resource within the classroom. I will be re-reading the article by Black et al. before returning to school in September and will be utilising some of these techniques in my practice.	Writing can be assessed by using the 'Writing indicators' in the Drumcondra English Profiles.

Also, writing can be assessed by using anonymous examples to show excellence and differentiated examples also to show the difference. Pupils can set the success criteria with the Teacher from using this method.

Writing can also be assessed by using the new Primary Lang. Curriculum, which I plan on using with my lang. group in Learning Support. | | | I have been impacted in such a way that I could not wait to do self-assessment with a group of pupils I have in Learning Support; The pupils keep asking me every Friday: 'Are we doing Traffic Lights cards today? They love it and they are so honest in their own assessments; My Principal was looking for a list of Diagnostic tests to look at Teachers now have Assessment folders in our school |
| SC 5 ED n/a | Earlier on in my teaching experience the dynamic of a class would have played a major role in deciding how I assessed key aspects of the curriculum e.g. I have taught mostly in a multi grade setting and a lot of organisation was essential in successful everyday AfL. I wasn't confident in my abilities to present assessment (other than the | | I will be more specific with feedback. It is a brilliant idea to have two examples of work of the appropriate level for the children to visibly compare and to critique using red pen for things that need to be worked on and using blue pen for things that were done really well. A teacher should model and show writing skills so that each pupil knows that | t is important to assess oral language because it permeates every aspect of the curriculum. The development of oral language involves a process of using thinking knowledge and skills in order to speak and listen effectively. This is important in every part of the child's learning. Challenges facing teachers includes the time required to effectively | This course was very well presented to us and I liked the way each module progressed. I think the PDST publications should be printed out and bound into a booklet as an active part of planning for every resource, learning support and class teacher! There are so many fun engaging ways each pupil can benefit from as it appeals to all learning styles. | Professionally, I feel more capable to carry out assessment effectively in my classroom following my completion of this course. I now begin a large number of lessons with WALT and WILF. I feel that I had always done this but it is nice to do it in a more formal manner to ensure it becomes part of our everyday routine and to draw the children's |

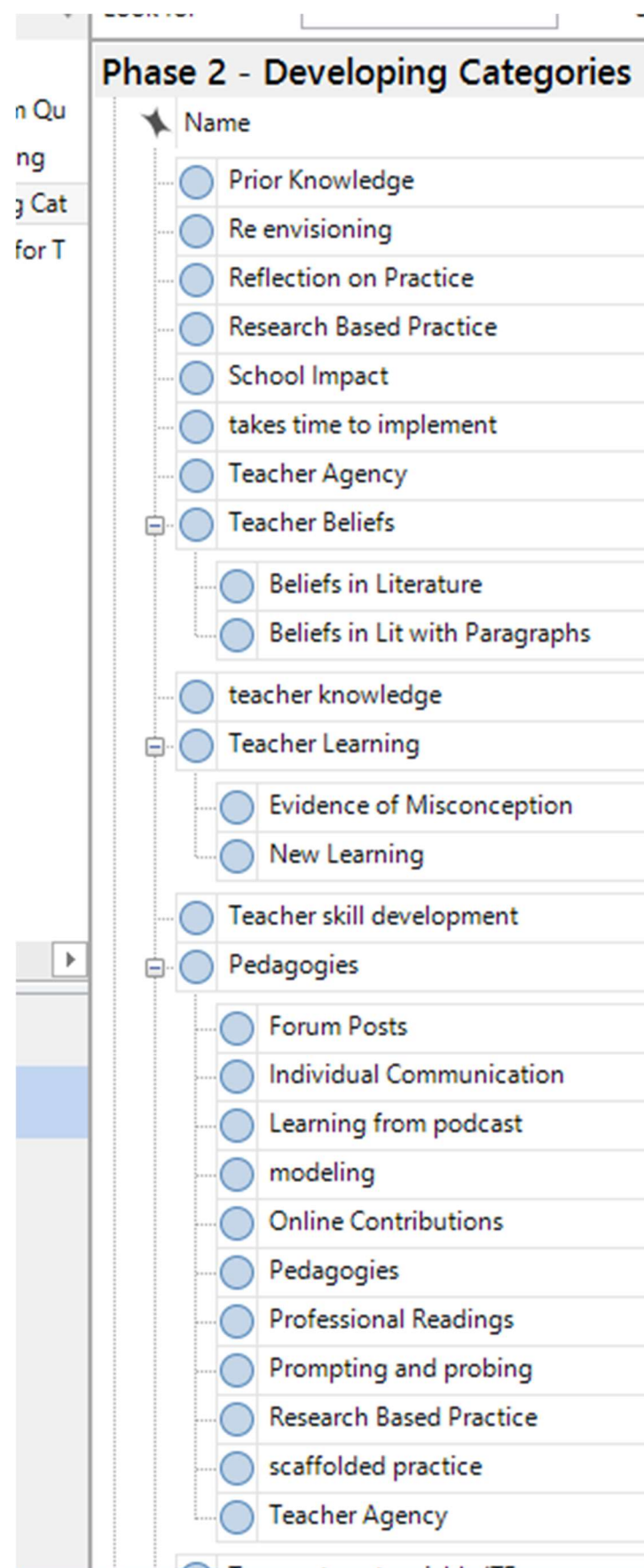|					
	traditional assessment methods) to my class. I then went into LSRT and the way I assessed changed again. I was at sea with the diagnostic assessment initially but it didn't take long to really gain a deep insight into how it works and why it is important to use that assessment to inform part of the children with SEN curriculum.		writing is something that improves day by day. I would like to use teacher/pupil conferences. I think that this would be a very useful and meaningful way to give pupils feedback.	assess every pupil's needs while enriching their learning in a meaningful way day to day.	Something for the visual leaner might be presenting the information in a concise colourful way on the literacy display board to help them use reading strategies while reading. Something I used from the PDST last year was the following decoding strategies (as a visual display with pictures)... chunky monkey (look for chunks you know)... use the picture... when two vowels go walking... skip the word... cover the ending...rhyming robot... cross check (did the word you said look right/sound right?)	attention to the learning intentions in a more concrete way. I certainly feel that I have made most changes in this area since completing the course. The course reminded me of the many benefits of peer assessment. It also made me more at ease about carrying it out as I was always worried that the children would criticise each other's work and that this would have a negative impact on their self-confidence. To date I feel that the peer-assessment that I have carried out has been very successful.
I MTP 4 SM used to assess for the sake of it. Can't buy the test in the shop. Planned and unplanned assessment is new to me; Asking questions can be unproductive; Didn't really get the link between learning theory and assessment	I want to develop success criteria in my classroom. I have found that I do use sharing learning intentions but that I fail to follow through by giving the children success criteria so I plan to teach the children how they will know they have been successful. I will teach the children to refer to the success criteria continuously and ensure I have it visible for the children to see	I want to develop success criteria in my classroom. I have found that I do use sharing learning intentions but that I fail to follow through by giving the children success criteria so I plan to teach the children how they will know they have been successful. I will teach the children to refer to the success criteria continuously and ensure I have it visible for the children to see. I also want to develop my questioning, making use of the lollipop sticks so that all children will feel motivated to engage during lessons and give them the opportunity to develop their higher order thinking skills.	found the article " How will we know what excellence looks like?" very interesting and surprisingly straightforward. It simply makes sense that showing children best work at the beginning of a lesson or series of lessons has an impact on their confidence in understanding what is expected of them. I found the tips when implementing CA very useful. The fact that younger children need a large quality gap between two pieces of writing in order to enable worthwhile comparison is seemingly obvious but something I would not have thought of.	What struck me in this module was how useful Blooms Taxonomy is in relation to oral language assessment. The Learning actions and verbs listed in Blooms Taxonomy are familiar to me in that I would use these words when making aims in my planning.	is easy to become overwhelmed with the amount of information/ resources available for assessing reading. What struck me in this module is the amount of ways in which reading can be assessed, both formally and informally. What I have learned, perhaps most importantly is that no matter what type of assessment I use in reading going forward, I will stop and ask myself right from the beginning, what is the purpose of reading? What am I looking for here? What am I actually assessing? I now understand that assessing reading ability needs to be correlated with purposes for reading. Understanding that I need to be specific in that what and why I'm assessing helps to break down " reading" into more accessible parts and all of a sudden assessing	Since going back to school I have introduced WALT, WILF, Lollipop sticks, thumbs and just this week, talk partners. I find that when I am preparing my lessons I am making the conscious decision to share the learning intention with my pupils. Sharing the learning intention makes the purpose of the activities clear. Both myself and the children know why we are doing the activities, we know what we are learning about. For example, the children know that we are learning to "sort and match things that are the same". I met with my colleagues in both Junior and Senior Infants in early September. We all have WALT and WILF displayed in our classrooms and have agreed to make a conscious effort to share the learning intention and try lollipop sticks as a way for children

					reading doesn't appear so daunting.	to answer questions. Lollipop sticks as an approach to effective questioning continually surprises me. When I pull name out the jar I am conscious that had it not been for the random selection I may never have called on that child. I have actually found myself thinking " God, I would have never even thought of asking him/ her".
MTP 7 VP Too late to test the pupils after the unit I need to do it as I am going along so I can use the data; interactive formative assessment is a new idea for me; I did not really understand the purpose of group work until I read about the "social mediation of learning"; I knew about good feedback but I didn't really understand the negative effect of grades.	My main assessment practices up to now have been mainly influenced by the training I received in England as assessment was an integral part of the training. I then learned a lot in the NQT meetings I attended in Navan Education Center, and the importance of assessment in the classroom. However, I feel having a younger class which I have mainly had throughout my career that ideas such as brainstorming and log recordings are difficult to complete. I have also learned from the questionnaire that I can definitely improve and establish more assessment practices in my classroom, despite the age of the student.	have also learned from the questionnaire that I can definitely improve and establish more assessment practices in my classroom, despite the age of the student. Paired talk, self-assessment, modelling of expectations and the use of quality questioning	I have thoroughly enjoyed module three and I have received some great information on how to formatively assess writing in the classroom. One of the main things which stood out to me in this module was watching the video on a writing conference. Here it was a pleasure to witness effective feedback, developing choice strategies with the student and actively involving the students in determining the next steps in their writing. The use of modelling strategies in the form of word webs as well as updating the learning goal of the student based on the success criteria was very informative.	Similar to XXX and XXX I was not familiar with the Drumcondra Indicator tests. Having trained in England checklists were an everyday part of my training and this included assessing Oral Language. I feel that if a child is presenting something during 'Show and Tell' it requires the teacher to stop and listen, without having to record what a child is saying, or tick checklists in order tick another box	I enjoyed watching the videos as it gave me some great ideas to use at whole class level. The use of conferencing, traffic light systems, as well as peer and self-assessment were very beneficial AfL strategies to implement. The use of Drumcondra Indicator Tests was also very helpful in establishing where the children's progress should be with regards to their reading.	I understand more clearly the advantages, and positive impact assessment has in developing my knowledge and skills further; by sharing the information I received from my Summer course, many teachers have become more open to continuing their professional development in the area of assessment share the learning intention before each lesson. This was something I failed to do, prior to this course Peer assessment is one of the key areas I have gained valuable insight into after this course. Peer-assessment was often something I failed to allow the children to complete together. However, implementing peer assessment in my class through discussion has enabled the children to be more involved in their own learning;
SC 13 EMC n/a	Prior to this I would have just regarded written tests as the only means of assessment. I didn't have any clue about AFL. It was then putting some of these	I have learned so much about Summative and Formative Assessment during this course so far. It is so interesting and it is part of my Post of Responsibility in	I too, having watched the conferencing video, feel motivated and inspired about the inclusion of the writing conference in my class. It is not a strategy I would have	Oral language assessment is extremely important and so is its development. It is vital for our daily lives in communicating with the world around us and	Prior to doing this course I wouldn't have done much formal assessment of reading only getting the children to answer questions on what they are reading and also	

	strategies into practice that I realised how important this method of assessment really is for the children that I am teaching. During my first two years of teaching I would have used a lot of peer assessment and self-assessment guided by the teacher but unfortunately this has not continued in my practice for the last two years as I have infants and I find it more difficult to use these strategies. Now I find myself using checklists and written tests as a means of assessment. The school that I work in would place a huge emphasis on this way of assessment and I find that you get sucked in to the thinking of the school and often forget other strategies out there.

For the coming year it my aim to use more AFL strategies in my classroom. taking time out and bringing the children up to you is hugely important for their confidence and to provide them with opportunities to further develop their learning. | our school.   I am more conscious now that Formative Assessment needs to be planned and needs to be on-going using different strategies in a widely supportive classroom environment. Who will benefit most of all? The pupils, of course.   Some Teachers may need to be more flexible in their role as Teacher to facilitator.... Some schools may need to look at their Policy on Assessment   and review it. | previously used as I would have initially thought about lack of time in the classroom. However, having watched the video, I can now see the benefits to it being rolled out routinely in the classroom and feel that time should be allocated to it, no matter how difficult it may be | understanding all that takes place around us too. Developing these skills at an early stage is crucial for their learning and it is important that junior classes | assessing their fluency of reading. I would never have thought about self-assessment or peer assessment of reading and this is certainly something I will do in the future. Even with infants I will encourage them to test each other on their sounds through paired work or group work.
The PDST website also gives good examples of how to assess reading and one that stood out to me was the video recordings or voice recordings. I had heard of teachers using this before and how effective it was but never used it myself. I think it would be good for self-assessment so that children can hear themselves read. Often children are so concours of what they are reading that they are oblivious to what they sound like themselves. Allowing them to hear their own voice means that they can see clearly what they are doing well and what they need to work on.

Learning intensions:

-take a slight break when I get to a full stop

-change my voice for different speakers

- re-read the sentence to help fix mistakes

- retell the story in my own words | |

					-break words up to help me work out the word	
MTP 2 MH I would rarely revisit work; students found my feedback boring and of no use; gold stars etc. can cause harm; focus on improving work rather than the score; you can record assessment other than on paper; I need to do assessment using the same approach as teaching i.e. in groups, use IT, blogs, learning journal	My assessment practices have been influenced by initial teacher educations and the assessment guidelines document. I have also been guided by colleagues as well my own experiences in the classroom	Going forward, I hope to involve pupils more in the learning process through metacognition. That I help pupils to become aware of what their strengths and needs are. I want to empower my pupils to become more self-directed learners, equip them with a varied toolkit of approaches for solving problems they may encounter in the classroom, but importantly in their everyday life.	When marking a child's written work, I am very conscious of the devastating effect handing back a copy covered in teacher's pen can have on a child's confidence. Depending on the child, I feel it is beneficial to select one or two elements for focused revision and just mark these. For example, pick out one or two capital letter errors or a few "tired" words for the child to edit. I have been using the strategy of two stars and make a wish for a number of years (in different variations depending on age level of the children) and have found it to be an effective strategy. The video clip on "conferencing" advocated a respectful approach when engaging in discussion with a child about their work.	I haven't used the profiles for oral language, but I would be conscious of using an approach that was practical and not too labour intensive for you. We use 3 "tracker" children to map pupil progress. I hope to use something similar for oral language when we return in September but maybe using digital audio files rather than paper lists. The pressure of working in a "culture of accountability" makes us feel the need to have big massive colour coded folders of data to justify our professional judgement. I'm interested in alternative (non-paper) methods of data gathering, particularly for something so organic as oral language, the richness of which really cannot be captured through anecdotal records or ticking of checklists? Any thoughts?	Depending on the age, diagnostic tests (We use the NARA test) usually test a pupil's comprehension and fluency. these provide the teacher with a "reading age" and a fluency score. Phonics and word identification tests (Jackson phonics & Quest) can also help to diagnose specific phonic knowledge gaps. After this, my assessment is on the child's attitude to reading. We have an informal chat, but I know there are numerous "Attitude to reading" surveys available, for examplehttp://www.literacytrust.org.uk/yrp/resources/454_resource-reading_for_pleasure_survey_for_ks2_and_above . This is the starting point for my teaching, where my goal is to begin to address the pupil's disposition/attitude to reading. Success experiences begin to build a child's confidence and their attitude to reading improves.	

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Appendix O: Code Book

Phase 1 - Open Coding

Name

- ◯ modeling
- ◯ Acknowledged Prior Learning
- ◯ Comparison to other PD
- ◯ School Impact
- ◯ Formative use of summative data
- ◯ scaffolded practice
- ◯ Technical Problems
- ◯ Promoting Current Best Practice
- ⊞ ◯ accountability
- ◯ Affirming Practice
- ◯ Evidence of Misconception
- ◯ Effort of Learning
- ◯ Pedagogies
- ◯ To counteract variable ITE
- ◯ New Learning
- ◯ Apprenticeship of Observation
- ◯ Relevant to Professional Practice
- ◯ Teacher Learning
- ◯ Learning from podcast
- ◯ Reflection on Practice
- ◯ Teacher Beliefs
- ◯ Research Based Practice
- ◯ Policy
- ◯ Challenges
- ◯ Complexity
- ◯ Research Question
- ◯ Assessment Litercy
- ◯ Quality Teacher Learning in Assessment
- ◯ Teaching Context

Phase 2 - Developing Categories

★ Name

- ◯ Prior Knowledge
- ◯ Re envisioning
- ◯ Reflection on Practice
- ◯ Research Based Practice
- ◯ School Impact
- ◯ takes time to implement
- ◯ Teacher Agency
- ◯ Teacher Beliefs
    - ◯ Beliefs in Literature
    - ◯ Beliefs in Lit with Paragraphs
- ◯ teacher knowledge
- ◯ Teacher Learning
    - ◯ Evidence of Misconception
    - ◯ New Learning
- ◯ Teacher skill development
- ◯ Pedagogies
    - ◯ Forum Posts
    - ◯ Individual Communication
    - ◯ Learning from podcast
    - ◯ modeling
    - ◯ Online Contributions
    - ◯ Pedagogies
    - ◯ Professional Readings
    - ◯ Prompting and probing
    - ◯ Research Based Practice
    - ◯ scaffolded practice
    - ◯ Teacher Agency

Look for ▾   Search In

Phase 3 - Searching for Themes

Name

⊟ Role of Online Learning - Reflection
- Identify Learning Environment of the Teacher
- Assumptions
- ⊟ Infuence on Practice
  - Teaching Context
- Teacher Agency
- Standardised Test Data
- To counteract variable ITE
- Teaching Context
- Promoting Current Best Practice
- Personal Accounability as a Teacher Quality
- Re envisioning
- Teacher Agency (2)
- Affect - Guilt Interest

⊟ Learning Processes to Promote Learning
- ⊞ Dissonance and Repositioning
- New Information
- Consolidation of Prior Knowledge
- Reflection on Practice
- Online Interaction
- Affect - Guilt Interest
- Pedagogies
- Evidence of Misconception
- Re envisioning
- Outside Expert

⊞ Activities to Promote Professional Learning
- Use in Classroom