

Learning and Teaching in the Primary School

Within this assignment, I will be critically analysing the relationship between teacher subject knowledge and effective teaching and learning within the primary school. This will include reflections and analysis of personal practice during Professional Teaching Experience (PTE). The understanding and implementation of the developing curriculum in Wales alongside considerations for the new curriculum will be demonstrated and referred to throughout this assignment to ensure that practice and pedagogy are relevant and meets the changing curriculum requirements.

All scenarios and details regarding practice mentioned in this assignment will remain confidential by excluding the name of the school, pupils, and staff. This is in accordance with British Educational Research Association (BERA) 2018 which states that all educational research should be conducted within an ethic of respect for: the person; knowledge; democratic values; the quality of educational research; and academic freedom.

The placement school I attended is in Swansea city and has approximately 514 pupils on roll. It is reported that around 12.4% of pupils are entitled to free school meals which is significantly lower than the average of 21% in Wales (My Local School, 2018). The school has identified around 28% of pupils as having additional learning needs and around 30% speak English as an additional language.

Throughout my time on placement, I was based within in a year 5 class. There is a total of 32 children in the class who are aged between 9 and 10 years. The classroom is ethnically diverse with 28% of the class speaking English as an additional language.

Willingham (2018) states that learning happens when we connect new information to what we already know. He suggests that children who have limited knowledge about the world, have a smaller capacity to learn more about it. According to Ball, Lubienski & Mewborn (2001), the importance of subject knowledge is in the preparation of teaching a subject or topic is essential for helping children make connections to what they already know, which results in effective learning. However, Rockoff et al. (2011) believe that there is no evidence to support the relationship between teacher subject knowledge and student achievement.

Shulman (1987) states that teaching begins with a teacher's understanding of what is to be learned and how it is to be taught. Although dated, Shulman's article titled Knowledge and Teaching: Foundations of the New Reform (1987) is seminal within education today. It places great emphasis on the transformation of a teacher's subject knowledge into pedagogical content knowledge (PCK). PCK refers to a teacher's need to blend their knowledge of subject content and pedagogy (Shulman, 1987). Teachers must transform their knowledge into a form that makes it accessible to learners, this involves the methods and practices that are used within the classroom. Shulman (1987) believed that this can be done by taking what he or she already knows and breaking it down into smaller ideas that can be explained to learners.

Interestingly, Richards (2014) identifies the importance of subject content knowledge but stresses that primary teaching is an immensely complicated business which involves more than just subject knowledge. He suggests that the interplay of several different attributes such as interpersonal, intellectual, physical, spiritual and aesthetic all contribute to effective teaching. Hattie (2012) also identified that subject matter knowledge was only a minor

consideration in student achievement. Hattie (2012) found that teachers' subject-matter knowledge had little effect on the quality of student outcomes.

In 2015, Professor Graham Donaldson conducted a fundamental review of curriculum and assessment arrangements in Wales from Foundation Phase to Key Stage 4. Following this review, Donaldson published a report which recommended curriculum and assessment arrangements that can help every child grow as capable, healthy, well-rounded individuals, who thrive in the face of unknown future challenges (Donaldson, 2015). Just as Shulman suggested in the eighties, Donaldson found that subject knowledge has stood the test of time yet remains the best path to a sound and relevant education (Donaldson, 2015). Within his report, Donaldson suggests that teacher subject knowledge should be imparted in a way that encourages children to independently explore a subject in more depth.

Mujis and Reynolds (2001) believed that it is possible to create a science of teaching by studying teachers and comparing the results – in terms of student progress. They suggest that this would provide a clear judgement as to what teaching models are effective for any or all subjects. In addition to this, Coe et al. (2014) reported that defining effective teaching is not easy, however, the most reliable way to measure effective teaching is to check it against the progress being made by students.

Coe et al. (2014) devised a framework which suggests that there are six components that contribute to great teaching. These components include pedagogical (subject knowledge), quality of instruction, classroom climate, classroom management, teacher beliefs and professional behaviours. On the contrary, Shulman (1987) suggests that many teachers dwell mostly on classroom management rather than subject knowledge or expertise. Shulman (1987) believed that while management of students is important, this must be

combined with subject knowledge and expertise within the classroom to ensure a knowledge-rich environment is created. Coe et al. (2014) suggest that there is significant evidence to support that teachers should use a reflective model to measure the effectiveness of their ability to transform knowledge into an opportunity for learning. They suggest that this should at least be carried out in subjects such as maths, literacy, and science.

One model which can be used for reflection within teaching is a four-dimensional framework which consists of foundation; transformation; connection; contingency. This model is known as the Knowledge Quartet and was devised by Rowland et al (2003). The knowledge quartet (KQ) is a comprehensive tool, however, it was created based on the teaching of mathematics. Furthermore, it is important to note that this model can be used across the curriculum as a guiding framework for all subjects.

The first dimension of KQ is known as the foundation; this encompasses the trainee teacher's theoretical background, beliefs, knowledge, and understanding. This aspect of the model forms the basis of all teaching. The model suggests that without this aspect, a teacher cannot or will not teach effectively because it refers to knowledge that is 'possessed' which is essential before the process of teaching can begin (Rowland et al, 2003).

The second dimension of the KQ model is known as transformation. Rowland et al. (2003) state that this aspect focuses on knowledge-in-action. Transformation of knowledge is demonstrated in both planning to teach and in the act of teaching itself. Many researchers, such as Mitchell et al. (2016) would agree that teachers need to be able to present new information and ideas to children clearly. In addition to this, Rowland et al. (2003) state that

a teacher needs to gain the ability to transform the content knowledge he or she possesses into forms that are pedagogically powerful.

The third aspect of the KQ reflective model focusses on the connection. Rowland et al. (2003) state that this aspect involves the coherence of planning and teaching. When using this aspect of the model for reflection, Rowland et al. (2003) recommend that teachers should focus on an episode, lesson or series of lessons to gain an awareness of the cognitive demands of different topics. Knowledge of individual students, common errors and misconceptions are what Shulman (1986) refers to as pedagogical content knowledge (PCK). Its application in planning for teaching falls within the connection dimension of the KQ because research suggests that a teacher who anticipates such obstacles to learning is better placed to plan a less 'bumpy', more joined-up learning experience for their students (Rowland et al, 2015).

The final aspect of the KQ model is known as a contingency. This stage refers to the teacher taking the opportunity to answer questions, aid understanding or offer an alternative explanation, this can sometimes take the form of deviating from the lesson plan or objective. Rowland et al. (2015) state that the term contingency captures the idea that the teacher cannot know in advance everything that will happen in the lesson. This stage can also be helpful on occasions where the teacher is faced with an unexpected event and challenged to deviate from their planned agenda for the lesson.

According to Rowland et al. (2015), mathematics teaching rarely proceeds according to plan, if ever. Bishop (2001) discovered that a teacher has a choice in these situations which mainly consists of ignoring or dismissing an irrelevant question or take it seriously and probe some investigation into the reasoning behind the question. Bishop (2001) stated that a

teacher who is aware of these and other options is often caught up in making split-second decisions or choices as he or she conducts the lesson. It is possible that these decisions will be influenced by the need to meet curriculum demands.

The National Literacy and Numeracy Framework (LNF) sets out the skills that learners are expected to develop within literacy and numeracy across Wales. The Welsh Government (2014) states that teachers should use the LNF to develop curriculum content and integrate subject matter – whatever that may be – across the curriculum. When this information is combined with the KQ model, it is evident that teachers who do not have a concrete understanding of the foundations of the curriculum and how to use it to teach subjects will be unable to teach children the skills set out by the National Curriculum regardless of their subject knowledge or expertise. Turner-Bisset (2014) states that teachers must interpret the demands of the National Curriculum by transforming the printed prescription into action before they utilise all their professional skills and knowledge.

In 2001, Ball et al carried out a study which found that teachers are critical factors in the learning of mathematics and the extents of their content and pedagogical knowledge determines student achievement. They found that teachers' memories from their own personal school experiences are a central influencing factor that affects the way in which they teach the subject. This led to a recommendation that trainee teachers should be prepared to have a positive attitude towards mathematics during training and throughout their teaching practice (Ball et al, 2001). Conversely, several researchers have argued that the content knowledge needed for teaching mathematics is not located in the minds of teachers but rather is realised through the practice of teaching (Hegarty, 2000). Hegarty (2000) states that the introduction to a wide range of appropriate teaching models – for any

or all subjects – is useful for trainee teachers. This means that institutions should provide trainee teachers with a toolbox of appropriate teaching models in order to give them a greater chance of being able to tailor their teaching to suit the changing curriculum and diverse range of individual needs. Trainee teachers need to be prepared for a shift of focus with regards to mathematics, as it is highly likely that the future of mathematics will rely heavily on a technological approach to learning rather than the traditional approaches that we know and use today. This shift will meet the demand for the curriculum to better equip children with a skill set that can be utilised in unknown future jobs and careers, as suggested by Donaldson (2015).

Teacher subject knowledge within the field of literacy is just as imperative as that in mathematics. Pearson and Gallagher (1993) developed a model which aims to assist teachers in delivering the content of this very broad subject. The model's aim is to gradually shift the responsibility of literacy task completion over time from the teacher to the student. This gradual release may occur over a day, a week, a month, or a year (Frey and Fisher, 2006). Frey and Fisher (2006) suggest that this should be done so that students can develop their expertise in all aspects of reading and writing, including oral language, phonemic awareness, phonics, vocabulary, fluency, and comprehension. There are four interrelated components of the gradual release of responsibility model – as shown in figure one.

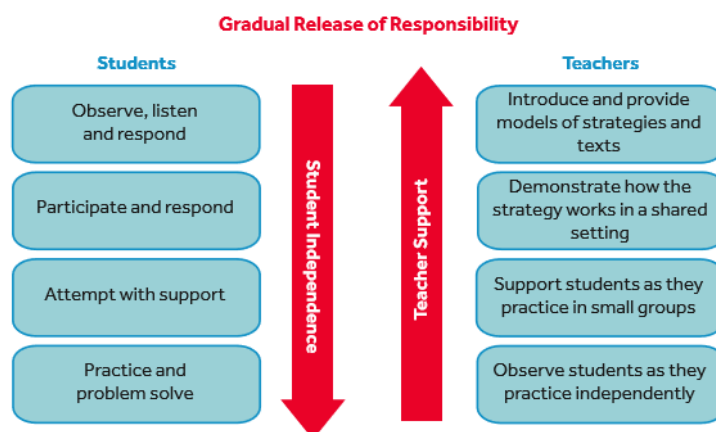


Figure 1.

The gradual release of responsibility model provides teachers with an instructional framework for moving from teacher knowledge to student understanding and application (Duke and Pearson, 2002). Frey and Fisher (2008) believe that learners do not have time to waste on the skills and strategies they have already mastered. They argue that the gradual release of responsibility model needs to be used in conjunction with the relevant curriculum otherwise the inclusion of the outlined essential skills for the subject can be missed. This model undoubtedly has links to the Welsh Government curriculum priorities in Wales, one of which prioritises ‘closing the skills gaps in Wales’.

Furthermore, Medwell et al (1998) suggest that in literacy, it is important for teachers to engage in instructional practices that align with how early writing and reading skills develop in young children. Medwell et al (1998) recommend that every education system must attempt to maximise the expertise of teachers in teaching literacy because high-quality literacy teaching demands high-quality literacy teachers. Furthermore, Hervey (2013) states that above everything else, effective teachers need to extensively and continuously develop their subject knowledge. According to Hervey (2013), effective literacy teachers can ensure that an increasingly diverse group of students have the skills to cope with the demands of

life beyond school. This links directly to Donaldson's recommendations for a new curriculum which aims to help every child grow into capable, healthy, well-rounded individuals who can thrive in the face of unknown future challenges (Donaldson, 2015).

Another important subject within the National Curriculum that needs to be considered is the Digital Competence Framework (DCF). This framework is the first element of the new curriculum for Wales to be made available (Welsh Government, 2016). Digital competence is the set of skills, knowledge, and attitudes that enable the confident, creative and critical use of technologies and systems (Welsh Government, 2016). DCF involves the teacher thinking of innovative ways to utilise digital equipment within the classroom to enhance teaching and learning according to Rothwell (2016). The framework does not replace or change the existing ICT framework because it is designed to be implemented cross-curricular (Rothwell, 2016).

It is emphasised throughout the DCF that ICT does not have to be the reason for utilising technology, the idea is based on the notion that there is a place for the use of technology within any or all subjects. The driving force behind this cross-curricular subject derives from the need for us to better equip children for the digitally driven future of the world (Rothwell, 2016). On the contrary, Greenfield (2012) argues that new digital technologies are rewiring the brain's frontal cortex - the area of the brain responsible for cognitive analysis and abstract thought.

During my professional teaching experience (PTE) I was placed within Key Stage 2 and became familiar with the relevant range and skills coverage outlined by the national curriculum. It quickly became apparent that teacher subject knowledge is extremely important. In my first week of teaching, I was planning a literacy lesson which was based on

a short story written by Ray Bradbury titled 'The Pedestrian'. The text was very complex and used very in-depth language such as intermittent, jockeying and ceaseless.

After reading the story and noticing this, I was able to analyse the text and become familiar with its complex sentences and structure while planning. I knew this was important as I was sure that the children would question the meaning of these words. I was confident that I knew the meaning of these words for my own understanding, however, I did not understand them well enough to be able to appropriately and effectively define each word for the children. Beck et al. (2008) state that teachers must teach definitions and contexts of new vocabulary in order to engage students in deep processing. To ease my anxiety regarding the complexity of the text, I studied it, made a detailed lesson plan and defined complex vocabulary. Curran (2015) states that this is the best approach because helps students succeed and focus on the result which is, of course, student achievement.

Following the lesson, I completed an Assisted Reflective Conclusion (Appendix 1) which allowed me the opportunity to share my thoughts and feelings during the lesson. The ARC identified that my practice related to the transformation element of the Knowledge Quartet model which emphasises the importance of a teacher's ability to transform the content knowledge he or she possesses into forms that are pedagogically powerful (Rowland et al, 2003). This approach to teaching is supported by research carried out by Bishop (2001) who found that a teacher who can effectively tackle unexpected questions during a lesson is more likely to provide an effective learning experience.

As I tackled the complex language and continued to plan activities for the children to carry out, I became increasingly anxious about the children's ability to follow and understand the story. I expressed these concerns to my mentor who assured me that the children would be

able to understand the story to a certain degree. I decided that the most appropriate approach to tackling this complex text was to spend one lesson reading and discussing its various elements as a class. I made the decision to carry this lesson over two days so that the class had time to analyse the meaning of the story, its vocabulary, and develop their thoughts and ideas regarding its content. Here, it is important to note that vocabulary knowledge has long been identified as one of the best predictors of reading and comprehension (Thorndike, 1917). This supports the notion that exposure to vocabulary – even if it is perceived to be too complex – plays a large role in the development of children’s reading and comprehension skills.

Overall, I feel that my subject knowledge with regards to recognising language techniques and my ability to understand the text was good. However, the need to define some words before I felt confident enough to explain them to the children proved that there are gaps in my knowledge and confidence which need to be identified before teaching a lesson. On this occasion, it was extremely helpful having a detailed lesson plan as it allowed me the opportunity to challenge and extend thinking. On the contrary, this was my first time teaching this class which made it difficult because I did not know the learners well enough to be able to judge where I needed to give more support. According to Hill et al (2005), effective teaching and learning go hand in hand with knowledge of learners and their characteristics as well as knowledge of the educational context.

While on placement I was also given the opportunity to teach several mathematics lessons. Many of the lessons I taught posed no issue for me with regards to subject knowledge, however, when asked by the teacher to carry out a mathematics lesson based on word problems, I struggled to understand the purpose of the teaching and learning. The lesson

did not make any links to the children's previous learning and as a result seemed very difficult to introduce. According to Rowland et al. (2009), a teacher who does not understand the meaning or purpose of a lesson will not understand the skills that need to be taught within it. Rowland et al (2009) argue that when this happens, the lesson has no clear objective and it is unlikely to produce a positive outcome.

I voiced my lack of understanding and concerns to the teacher who then explained that the lesson was being carried out for assessment purposes. At this point it was much clearer what skills I was expected to focus on during the lesson, however, I was asked to use an interactive maths resource that was unfamiliar to me. This meant that in order for me to teach the lesson effectively, I needed to spend some of my own time using the resource to understand its features and layout, as well as familiarise myself with the word problem the children would be working on. On reflection, I believe that my personal negative experiences with mathematical word problems impacted my confidence in the topic. Haylock (2014) states that high levels of anxiety can affect a person's ability to perform to their potential.

On this occasion, I was fortunate enough to have time to prepare for the lesson, however, had I not been given enough time to plan and prepare before-hand that my level of anxiety would have impacted the quality of learning within the lesson. As a result of high-quality planning and preparation, I was able to effectively introduce the topic, explain what the children needed to do, identify the approaches they could use to solve the problem and answer any other questions that the children had during the lesson. Upon reflection and evaluation of the student achievement following the lesson, my effort resulted in a lesson

that was rich in possibilities for collaborative learning in the zone of proximal development (Turvey et al, 2014).

During my time on PTE I was given the opportunity to teach an ICT lesson related to cyber bullying. The topic for the week was anti-bullying. The children had already completed a range of tasks and activities related to the topic but I planned for them look at cyber bullying in more depth. The class were asked to create a digital anti cyber bullying poster that could be published on the school website. I recognised that every child would need access to a computer so took the necessary steps to ensure this was possible in advance. I met with the class teacher to find out what programs the children knew and chose a program that I felt comfortable with and the children knew well. On reflection, it is evident that I asked the children to use a program they were familiar with because of my lack of confidence and knowledge in ICT. I was not confident enough to challenge them, or because of my lack of knowledge, reach a point in the lesson where they were challenging me. In this lesson I did not give the children the opportunity to challenge themselves or explore something new. Trucano (2005) states that there is evidence to suggest that when teachers use their knowledge of both the subject and the way pupils understand the subject, their use of ICT has a more direct effect on student achievement.

Although my subject knowledge was adequate within literacy and maths, I recognised that my subject knowledge for ICT was poorer than I anticipated. I believe this was because I was unfamiliar with some of the apps and programs the school was using for learning. This meant that I needed to spend some time familiarising myself with the technology before I included it in my lesson. As a result, I did not utilise these tools until I felt competent which meant that for a short period of time, I tended to concentrate on aspects of ICT that were

familiar, such as word-processing and presenting. This approach to practice was poor and in hindsight, it is evident that it would have been more beneficial to myself and the children if I had allowed the children to guide and support me while they used the programs because they were competent in using them safely and independently. However, Wright (2008) would argue that good practice involves modelling what it is you want the children to achieve.

On the contrary, I believe that my knowledge was adequate with regards to covering the DCF because many other subjects I taught involved the use of digital equipment. For example, the children led the use of the interactive maths resource in the word problem lesson, they used iPads to record their Welsh oracy, they created and used QR codes to access various online resources for lessons and I also incorporated the use of Padlet on the iPads into many literacy lessons to share thoughts, ideas and opinions. The use of digital equipment for these lessons covers at least one of the four strands of the DCF.

As previously stated, I feel that my subject knowledge for literacy and maths was adequate during my first PTE placement, however, I lacked confidence and knowledge in some areas of these subjects, as well as ICT. Because of this, I will ensure that I utilise the apps and programs used by the school during the next part of my PTE practice. I am extremely pleased with the progress I made with regards to subject knowledge during my first PTE placement, however, I am aware that there are still areas where I lack knowledge. The main subjects I lacked knowledge in included humanities, music and physical education.

Therefore, during the second part of my first PTE, I will also request to plan and teach a series of lessons for each of these subjects.

The understanding and implementation of the developing curriculum in Wales alongside considerations for the new curriculum have been analysed and referred to throughout this assignment. Practice and pedagogy that is relevant to the National Curriculum have been evaluated and provided the basis for the reflection of personal practice. This assignment highlights the importance of transforming knowledge into forms that are accessible to learners.

The Knowledge Quartet has been analysed and referred to within this assignment because of its usefulness in critically analysing and measuring effective teaching and learning. Some researchers suggest that there is significant evidence to support that teachers should use a reflective model to measure the effectiveness of their ability to transform knowledge into an opportunity for learning. Overall, it is imperative that primary school teachers have a deep understanding of all subjects covered by the National Curriculum. Research provides evidence that without teacher subject knowledge, children will not be exposed to new and exciting information. The role of a teacher within the 21st century is to help every child grow into capable, healthy, well-rounded individuals who can thrive in the face of unknown future challenges. The role involves a blend of pedagogical (subject knowledge), quality of instruction, classroom climate, classroom management, teacher beliefs and professional behaviours. It is important to note that effective teachers see themselves as lifelong learners. They understand the need to continuously update their skills and knowledge in response to the changing world, the ever-evolving curriculum, new research, and emerging information about literacy learning and teaching (Hervey, 2013).

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Appendix 1.

Assisted Reflective Conclusions (ARC) Model

Date: 06.11.18 (Guided Reading)

Critical incident (focus): First whole class teaching session. Read whole class the story of the Pedestrian by Ray Bradbury. This is a complex piece of continuous text.

<i>Experience</i>	
<i>Feelings</i> <i>What are your feelings regarding the experience?</i>	At the start of the lesson I was feeling very nervous, however, once I had introduced the story to the children and asked them what they thought the story was going to be about I felt relaxed. I feel as though I read the story with good pace and expression. I also made sure to use character voices to make the complex piece much more child-friendly. This is a short story and wasn't written for children, therefore there were no pictures for the children to look at. To overcome this I made a PowerPoint presentation of abstract art paintings that represented the key aspects of the story. This was displayed as I read and the children seemed to engage and interact with this well.
<i>Remember and Understand</i> <i>What aspects went well?</i>	The children engaged with the text and participated fully in the class discussion. All the children had lots of ideas, thoughts, and opinions regarding the topic of the story which led the class to begin questioning the way in which we live our lives today. The children made predictions based on the title before hearing the story and were challenged to listen to see if their prediction was correct. This gave the lower ability children the motivation to listen and follow a fairly complex piece of writing. Many children raised questions about the meaning of certain words mentioned in the text. I was able to answer all questions regarding the vocabulary as I had recognised this when reading the text before planning and decided to make a list of vocabulary that may have been unfamiliar to the class. On reflection, I am very pleased that I made this decision because it supported the children's understanding and helped take advantage of those teaching points that were not planned for.
<i>Evaluate and analyse</i> <i>How effective was classroom management?</i>	I was happy with the classroom management technique I used throughout the discussion. Today I used 'show me five' which was effective, however, the children respond quicker to the 'clap five times' method.
<i>Conclusions and actions</i> <i>What will you change next time to improve the learning environment?</i>	Overall I was very pleased with the lesson and the general behaviour of the class, however, I believe that when I want the whole class' attention, they would respond faster to the 'clap five times' method so I will implement this technique in the follow-up session on 07.11.18.
<i>Transformed experience</i>	