

APPENDIX GA36c

LEVEL 6 ASSESSMENT SPECIFICATION

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Programme:	Primary PGCE		
Module:	Learning and Teaching in the Primary School		
Module code:	M6X02149	Contribution to Overall Module Assessment (%):	100%
Lecturer:	Rachel Wallis	Internal Verifier:	Rachel Wallis
Assignment Title:	<i>A critical analysis of the relationship between teacher subject knowledge and effective learning and teaching in the primary school</i>	Word count (or equivalent):	4, 000 words for written assignment with 1, 000 words equivalent for appendices
Submission deadline:	11/01/2019 (23:59)	Return date of provisional marks & written feedback:	8/02/2019
Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 40%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.		
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

Module Learning Outcomes (from module syllabus)

- 1) understand different perspectives, approaches and theories of the teaching of literacy and numeracy in the primary school
- 2) demonstrate secure knowledge and understanding for teaching the Areas of Learning in Foundation Phase and Key Stage 2 subjects
- 3) critically analyse, interpret and evaluate a range of teaching strategies and pedagogic skills to promote effective learning across the primary curriculum

A critical analysis of the relationship between teacher subject knowledge and effective learning and teaching in the primary school.

Introduction

Teacher subject knowledge and its relationship to children's learning has had much research conducted (Schulman, 1986; Even and Tirosh, 1995; Loewenberg Ball, Thames and Phelps, 2008; Park and Oliver, 2008). This essay will investigate the relationship between teacher subject knowledge and its relationship between effective learning and teaching in primary school. Exploring seminal pieces of research that examines teacher subject knowledge and reflecting on my own personal teaching experience will do this. This essay will also explore the impact of the new curriculum in Wales will have on teacher subject knowledge, and in particular, the implications this will have on my own subject knowledge.

When reflecting on my personal teaching practice and subject knowledge it is important to consider the context in which my teaching experience is being carried out in. My school is located in a deprived area of Cardiff, with statistics revealing the catchment area is in the top 10% deprived areas in Wales for the physical environment, housing domain, community safety, health domain and income domain. Almost half of the pupils enter the school with little or no English, with 26% of the pupils at the school are eligible for free school meals (higher than the national average of 19%) and 28% of pupils having additional learning needs (higher than the national average of 21%). Shulman (1987) states that grasping an understanding of what a learner requires must be specific to the school to which the learner is at, and the subjects being taught. This is where the context of the school that a teacher is working in is so important. This will be discussed more in depth in the section where I will critically reflect and evaluate my own subject knowledge.

Literature Review

When reviewing what makes great teaching, Coe, Aloisi, Higgins and Major (2014) stated there are six components to great teaching, and said the first component is a teacher's subject knowledge. They stated that the most effective teachers have a wide depth of subject knowledge. More recently in Wales, an attempt to increase the

calibre of teachers being allowed to train to teach has been observed, for example, increasing the minimum entry requirements (Gov.Wales, 2016). To train as a teacher in Wales, one must have at least a grade B or above in English and Mathematics, whereas this was previously a grade C. This demonstrates how the Welsh government are recognising the need for teachers to have a sound knowledge base in the core subjects. When looking historically at the research area of teacher subject knowledge, it is also apparent that the knowledge base of teacher used to solely consist of looking at the content knowledge the teacher possessed in a subject, whereas more recently this has transitioned to a focus on pedagogy (Mishra and Koehler, 2006). Shulman (1987) took an in-depth look at the knowledge base of teachers, and was a seminal researcher who stated that the knowledge base of a teacher was much more complex than what prior research has stated. For example, Shulman (1987) stated at a minimum, there are 7 different types of knowledge base (see appendix A). One of these types of knowledge base is pedagogical content knowledge (PCK), which Shulman (1987) states is of particular importance for teachers, as it blends both pedagogy and content knowledge together, which gives the teacher an understanding of how problems are organised, represented and then adapted to the learner's needs, ability and interests. One particular category of knowledge base which Shulman (1987) described as important is curriculum knowledge. This is important to note because of the new curriculum being brought to Wales and the current ambiguity about what this will look like, meaning all teachers in Wales will have to build up their knowledge of the curriculum when it is released and being made statutory in 2022 (Gov.Wales, 2018a). This will be discussed more in the next section in relation to my own subject knowledge and how the new curriculum will impact my teaching and the children's learning.

One new aspect that is having increasing dominance in primary schools in Wales is the use of ICT. In Wales, digital competence is now one of the three cross-curricular responsibilities having a place alongside numeracy and literacy (Gov.Wales, 2018b). This means that there is a focus on developing ICT skills that can be applied to a range of scenarios and subjects. Mishra and Koehler (2006) wrote about the increasing use of technology in schools, thus the need for a teacher to have knowledge of technology as part of their general knowledge base. This is something that teachers will struggle with due to the rapidly changing technical world, with

Mishra and Koehler (2006) writing of the importance of teachers having the ability to learn and adapt to new technologies.

Shulman (1987) created a model of pedagogical reasoning and action that lists 5 key features of subject knowledge. The first feature is comprehension- to teach a subject one must first understand it. This is now something that new trainee teachers are expected to have in the core subjects with the increase of the minimum entry requirements observed in Wales. Comprehension is something that can be difficult for certain subjects, for example music. In the current key stage 2 programme of study in Wales, pupils are to be given opportunities to play instruments using dynamics, good technique and phrasing, as well as compose and appraise pieces of music. For teachers who have no experience in music these standards would be difficult for them to learn, so comprehension of subjects is not always easy. Once a subject is comprehended, the ideas must be transformed for the teacher to be able to deliver the information in a manner in which the learner will understand it. Again, this stage could be difficult for a subject a teacher struggles with, as comprehending the subject can be difficult enough without the addition of needing to transform it for the pupils. The third aspect of the model is instruction- the way in which the teacher interacts effectively with pupils giving clear explanations on the subject matter. Once this is done, the teacher must evaluate the understanding of pupils and if they have grasped what is being taught. Lastly, the teacher must reflect on whether their pedagogical reasoning and action was effective or not, and the elements which went well and what could be improved next time.

The knowledge quartet is another seminal piece of research in teacher subject knowledge area of research. The knowledge quartet proposes 4 dimensions involved in subject knowledge; foundation, transformation, connection and contingency (Rowland, Huckstep and Thwaites, 2003). This is a similar model to Shulman's (1987), with the foundation dimension of the knowledge quartet resembling Shulman's comprehension stage. Rowland, Huckstep and Thwaites (2003) describe the foundation dimension as the teacher understanding the subject and its content. However, the researchers also include the understanding of the pedagogy in the foundation stage and learning how children can be taught, which differs to Shulman's (1987) comprehension stage. The second dimension to the knowledge quartet is transformation- being able to explain and model what is being taught so learners

understand it. Again, this stage is very similar to Shulman's second stage of transformation. Where the knowledge quartet starts to differ from Shulman's pedagogy reasoning model is in the third and fourth dimension- connections and contingency. The connections dimension is where the teacher binds together different lessons, connecting a sequence of ideas introduced to learners. Furthermore, it is about making progressive steps to develop the learning further and make future connections. The contingency dimension is concerned with events in the classroom that are difficult to plan for, such as difficult questions arising or children's readiness to move on to the next stage of learning.

However, there are some limitations regarding the knowledge quartet research, one of which is its applicability. The knowledge quartet was founded based on examining maths lessons- just one subject taught in primary schools. This research could have been conducted looking at a variety of subjects, to ensure the four dimensions are applicable to subjects other than maths. A further critique of the knowledge quartet is the amount of mathematics lesson observed before developing this model- only twenty-four mathematics lessons were observed before developing the knowledge quartet, making the evidence provided for this model fairly limited. Goulding, Rowland and Barber (2002) also investigated primary school teacher's mathematics subject knowledge, and they found a relationship between insecure subject knowledge and poor planning and teaching. One critique of this study is that it is somewhat outdated now and the same relationship may not be found today. Again, this was another study that investigated subject knowledge and mathematics lessons, limiting its generalisation to all other subjects taught in primary schools.

Hattie (2012) concluded that the amount of knowledge possessed by a teacher and their pedagogical knowledge was not of great importance, but rather how the teacher sees the surface and deeper understanding of each subject. This is combined with the teacher's belief about how to teach and their perception of the children's learning- when the children are learning and what have they learned about the subject. Hattie (2012) noted that knowledge about the curriculum is important, but rather how the teacher organises this information. This is something which will be of particular importance for teachers in Wales with the new curriculum, as possessing the ability to organise the cross curricular areas of learning and experience is something which could be challenging to organise. Hattie (2012) stated an expert

teacher has the knowledge to integrate the learning of a topic cross curricular, something which will soon be made mandatory for teachers in Wales.

Other important aspects essential to pupil learning are classroom management (Voss, Kunter and Baumert, 2011). A teacher needs good classroom management to ensure pupil learning as this maximises the amount of time of instructional teaching. Also having a range of teaching methods is important (Voss, Kunter and Baumert, 2011) as this makes up this time of teaching, applying a range of teaching strategies to make productive use of the teaching time allocated (as a result of classroom management). In a study by Voss, Kunter and Baumert (2011) it was revealed that both pedagogical and psychological knowledge combined optimises teaching and learning. This importance of psychology has been acknowledged in Germany, where it is compulsory that all trainee teachers undertake psychological training as part of their university course (Voss, Kunter and Baumert, 2011). However, in the study by Voss, Kunter and Baumert (2011) that summarised this finding of pedagogy and psychology together being important, the research examined mathematics lessons. Much of the research that investigates this topic area does this by analyses mathematics lessons, which questions the applicability of the research to the holistic primary school setting. Further research needs to be done on teacher subject knowledge and effective teaching and learning whereby the methodology inspects several subjects as opposed to narrowing the literature base to solely examining mathematics.

One study that investigated teacher subject knowledge and effective teaching and learning by examining science lessons was conducted by Zhang (2008). It was found that when science teachers possessed advanced degrees in science it significantly correlated positively with student achievement. Conversely, a significant negative correlation was found between years of teaching and student attainment. This reveals that expert knowledge in a subject can influence student outcome, but found teacher behaviours (engagement levels, teaching strategies and behaviour management) to be a mediating effect for student achievement. This supports the previous research, that a teacher's subject knowledge is important, but there are other factors implicated in in pupil learning. This research was conducted in an American school, with children of secondary school age. This means that its

applicability to primary schools in the United Kingdom may be challenging, due to the differences in how schools are run between the two countries.

Analysis and evaluation of own subject knowledge

This next section will consider my own subject knowledge, and the impact it currently has upon my teaching and the learning of the children. To start this consideration of my subject knowledge, I will start with a brief description of my education achievements- I achieved 14 GCSES ranging from A*-C, 3 A-Levels, a psychology degree and a master's degree in health psychology. I felt confident going into my first placement having this broad range of subject knowledge. One particular strength of my subject knowledge (excluding my degree specialism in psychology) is English. This proved to be particularly useful for the context of the school my placement is in- a deprived area in Cardiff with half of the children having very little or no English. This meant my own ability to use and teach the English language was challenged from the outset, where I had to make my resources very visual and employ certain strategies when teaching a group of children with little English, such as using minimal and basic English and making the teaching very visual, by using pictures to accompany the language I would be using. This is something which will be continued to be challenged in the commencement of the second part of the placement, where I will be responsible for teaching a year 6 class (as opposed to year 1 previously). This brings a new set of challenges, as I will be using more complex vocabulary and teaching more complex subjects, although I will still be faced with the same language barriers observed in year 1. My plan to overcome this barrier is to use similar strategies I used with the smaller children, such as being very visual in my teaching, whether this is using actions when speaking, such as pointing to an object I am talking about or using visual resources to accompany my teaching. If these strategies are not enough where English is a greater problem than I foresee then I will ask my class teacher for some advice and conduct research on how best to tackle low levels of English and overcome the language barrier.

When observing the requirements to become a teacher in Wales it has become apparent that the entry standards are increasing (Gov.Wales, 2016), raising the English and maths GCSE requirements to a grade B. Although English is a strong

subject of mine, maths is a particular challenge. I received a grade C at GCSE level meaning I had to sit an equivalency test to get a place on the PGCE course. When having all three of my teaching observations at my placement, I chose all my observed lessons to be on myself teaching mathematics. I chose this as mathematics is my weakest subject, thus wanting to challenge myself and be subjected to constructive criticism to improve my teaching practice faster than what I would without such scrutiny and feedback. Prior to starting this course, I knew my mathematical content knowledge was poor so tried to learn the pedagogical concepts of mathematics to help improve my teaching of this subject. Shulman (1987) states it is the pedagogical content knowledge (PCK) that is what is important for teachers, as it blends both pedagogy and content knowledge together. When reflecting on the feedback of my mathematics observations, it was apparent that I needed to significantly improve my understanding of mathematics pedagogy. The main criticism I received was the need to consider the concrete/pictorial/abstract (CPA) concept when teaching mathematics. Upon receiving this feedback, I did some more personal research into the pedagogy of mathematics, in particular this CPA model. Studies have shown that using this model when teaching improves pupil learning (Jordan, Miller and Mercer, 198; Sousa, 2008; Putri, 2015), thus I started to incorporate this model into my practice and considering this when planning any lessons. For example, when introducing a new subject I would ensure children have the opportunity to experience and handle concrete objects first to experience the concepts and bring them to life. Secondly, I would make the teaching very visual (adhering to the pictorial stage of the model) by using number lines or number grids. This would encourage the children to make a mental connection between the object they just handled (such as number blocks) and the visual resource shown to them. Once these two stages were completed I could then move onto the abstract stage of the model, transforming the topic area to an abstract concept to the children- where they are able to use symbols to model and solve problems. Before this feedback was given to me, I had a tendency to skip the first two stages of this model, leaping to the abstract stage. This meant that the lack of my pedagogical knowledge impacted negatively on my teaching practice, thus resulting in a negative impact on the children's learning.

Another area of knowledge base Shulman (1987) described as important is curriculum knowledge, with the teacher needing to manage and organise the curriculum holistically, considering how to make cross-curricular connections. When considering each area of learning in the new curriculum and my subject knowledge I am confident that I have the content knowledge needed to be able to teach year 6. I consider some of the areas of learning to be my specialism, such as expressive arts, language, literacy and communication and health and wellbeing. For example, I possess expert knowledge in music, having studied music for many years and undertaking many musical examinations; having a masters degree in health psychology with qualifications in wellbeing therapies and having high competencies in English language and literature. In my opinion, these areas of learning in which I possess expert knowledge in stand me in good stead for teaching, although it is my pedagogical knowledge I need to improve throughout my time on the PGCE. This will be done by attending all lectures in university, ensuring I read lots of books by specialist authors who have conducted much research on the pedagogy of each area of learning, and, listen to valuable experiences from colleagues and their suggestions on how best to improve my pedagogical practice.

When considering Shulman's (1987) pedagogical reasoning and action model that lists 5 dimensions of subject knowledge, I have confidence in following these steps when teaching. For example, the first dimension is comprehension- understanding a subject prior to teaching it. As discussed above, I believe I hold good knowledge in a wide range of subjects. Once the subject is comprehended, it must be transformed into a deliverable manner in which the learner will understand. This is something I need to improve upon, as my delivery has previously not been as clear as it could have been. For example, not following a concrete/pictorial/abstract model, and jumping straight to the abstract stage. When reflecting on this, I realised that this was a large error due to the age of the children I was teaching (year 1). Prior to the commencement of the first teaching experience, I did not have much experience with smaller children, and I did not realise that learning needed to be made into a real life experience with lots of visual aides to consolidate this learning before it could be made an abstract concept. This is something I learned throughout the first teaching experience, and something I want to develop in the continuation of the first teaching placement. More specifically, it is the transformation element I want to improve, the

manner in which I can deliver the information. I will do this by investing more time when planning and considering how best to deliver the content best, asking my class teacher for more advice before I deliver lessons and afterwards for feedback. The fourth stage of Shulman's (1987) model is evaluation- did the pupils grasp the subject or not. I believe I made good progress in this stage in the first teaching experience, where I would monitor each pupil's progress at the end of the lesson. This is something I can develop further in the continuation of the teaching experience by considering more in depth how best to move each individual child on. The last stage of the model is to reflect, something which I have had lots of practice doing in the first teaching experience, by doing daily reflective evaluations and end of week reviews reflecting on my progress and what next to do.

When considering the knowledge quartet (Rowland, Huckstep and Thwaites, 2003) and its 4 dimensions (foundation, transformation, connection and contingency) and comparing it to Shulman's (1987) pedagogical reasoning model it becomes apparent that the largest differences in the knowledge quartet is in the final two stages- connection and contingency. The connections stage of the knowledge quartet is about the teacher binding together different lessons and connecting ideas. This is something I did struggle with in my first teaching block, planning a sequence of lessons building a skill. I believe that this is something which will be more difficult when I return to school teaching year 6 as I will be teaching more complex skills which will need to be planned more carefully. The contingency stage is concerned with events in the classroom for which I cannot plan, such as difficult questions arising or children's readiness to move onto the next stage. This is something I have already started to plan for when completing my action plan with my personal tutor last term. I have planned contingency strategies for the maths class I will be teaching, in the form of stalling strategies. For example, having a question box for the questions I am unsure of, and, a research corner for the children to go off to and work independently on difficult questions. This stage is something I did not have much practice at during my first teaching experience, as small children did not present with difficult questions, and they would progress onto a level for which I could easily cater to. The contingency stage is something I will be faced more with in year 6, so will have to work on my ability to overcome this stage.

Conclusion

To conclude, there have been lots of research into teacher subject knowledge and its relationship with learning. Shulman (1987) discussed the seminal idea of pedagogical content knowledge (PCK), the blending of both pedagogical knowledge and the teacher's content knowledge. This idea was developed further with Shulman (1987) creating the pedagogical reasoning model with 5 features. A later model was developed by Rowland, Huckstep and Thwaites (2003) in the form of the knowledge quartet with 4 dimensions. This model differed from the earlier model as it encapsulated most of Shulman's features but also added in a connections and contingency stage. When considering the research in this field holistically, it is apparent that more research is needed, as much of the literature is based on mathematics. The latter half of this essay discussed my own subject knowledge with relation to the existing research in the field. This can be summarised as me having a good overall content knowledge, with particular specialisms in English, music and psychology. However, I discussed shortcomings in my pedagogical knowledge, and this is something I planned to improve this term for the continuation of my teaching experience. Changes to the Wales curriculum was also discussed, and how this will have an impact on my teaching and subject knowledge, such as having to organise and manage the work for the new curriculum and making many cross curricular links. Lastly, pupil learning is not solely limited to a teacher's subject knowledge (both pedagogical and content), as this is mediated by factors such as classroom management, teaching strategies and psychological knowledge (Voss, Kunter and Baumert, 2011).

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Appendices

Appendix A – *the categories of knowledge bases as described by Shulman (1987).*

