

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

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Introduction

Within this essay the aim is to critically analyse the relationship between teacher subject knowledge and effective learning and teaching within a primary school setting. In order to do this I will firstly write a literature review using research from the required reading list and the additional reading so that I am able to gain an even better understanding about teacher subject knowledge and its importance within the primary school environment. To critically analyse the relationship between teacher subject knowledge and effective learning and teaching I will reflect upon my time within a placement school for the Professional Teaching Experience (PTE). For ethical reasons the name of the school, the staff and the children will need to remain anonymous, (BERA Guidelines, 2018). For this reason I will refer to the placement school as 'School X' and any names I use have been changed to ensure the anonymity and protection of the identity of those mentioned.

School X is quite a large community school catering for 420 pupils aged between three and 11, with 53 staff members and has an attendance percentage of 94.3%. As a pioneer school for the new curriculum the children are encouraged to promote their own learning. According to Estyn (2014) around 35% of the children are eligible for free school meals which is seen to be higher than the average 21% within Wales. The school has identified that roughly 16% of the children have additional learning needs (ALN) with very few of those having special educational needs (SEN). Around 16% of the children speak English as an additional language (EAL) and approximately 18% of the children come from ethnic minority backgrounds with very few children who are looked after by the local authority. I was placed in a mixed group class which consisted of year 1 and 2 children which started off with 28 children but by the time of my last day went up to 29 children aged between 6 and 7. The class teacher was assisted by one teaching assistant and a volunteer occasionally until I had finished my observation week.

Literature Review

According to Gipps, McCallum and Hargraves (2000) the meaning of teaching is to pass on knowledge whilst reinforcing skills and an understanding to their pupils. How would it be possible for a teacher to do this if they did not know what it is they are trying to pass on? Kleickmann et al., (2013) states that pedagogical content knowledge (PCK) and content knowledge (CK) are the main aspects that can affect how children learn and progress. Shulman (1987) states that pedagogical content knowledge represents mixing content and pedagogy together in a way that can be adapted to suit the ability of the learners and to encourage the learners to be interested in the subject matter. According to Bartlett and Burton (2016) in order to tackle the weaknesses within teaching teachers must strengthen their subject knowledge, increase their pedagogic skills and raise the expectations of the learners in their classroom. The Welsh Government (2012) states that for a teacher to be successful then they must be able to organise and plan lessons effectively having a clear understanding of the lesson they are teaching. However, they also state that there are many aspects that go together to create a successful teacher, such as, a positive body language, belief in all the children under their care, a positive learning environment and an inclusive approach, (Welsh Government 2012). Coe et al., (2014) states that the most effective teachers have a deep understanding of the subjects that they teach. When a teacher's knowledge falls below a certain level it is the learners who miss out on effective learning experiences. Baumert and colleagues (2010) cited in Kleickmann et al., (2013) states that despite there being a high link in how PCK and CK affect how students learn CK had a lower prediction than PCK for student progress. Shulman (1987) states that the teacher has knowledge that their students do not, they understand what needs to be taught and how to teach it. Rowland, Huckstep and Thwaites (2003) states that there are four areas that make up the 'the knowledge quartet' which can be used as a tool for developing the teaching of mathematics. These are foundation, transformation, connection and contingency. The foundation aspect involves a teacher's knowledge, beliefs and understanding which they acquire during their training to use in the classroom. It is this knowledge and beliefs that allow them to decide which pedagogies and strategies they use within their classroom, (Rowland, Huckstep and Thwaites, 2003). Coe et al (2014) state that teacher beliefs on educational theorists

is why they adopt particular practices within the classroom. This would mean that if a teacher was to agree with the theory of John Dewey then within their practice they would include physical activities where the children can take a hands on approach to their learning, (Pound, 2005). Whereas if a teacher had the opposite belief then the children may only be able to learn through rote learning and not experiencing any other form of pedagogy. The second aspect that Rowland, Huckstep and Thwaites (2003) state is important is transformation. This aspect is in regards to how the teacher puts the subject knowledge into action, meaning how they pass on the knowledge to their learners. There are different theories and approaches that teachers can use for their classroom to be an effective learning environment. Which, according to Shulman (1987) is the capacity of a teacher to be able to transform their knowledge of the subject and portray it to the children in a way that is best suited to them. Pound (2005) states that not one child learns the same way so it is down to the practitioner to be able to differentiate their teaching strategies for maximum benefit. Rowland, Huckstep and Thwaites (2003) discuss how this aspect looks at the importance of how the teacher demonstrates and models the learning to the class. They discuss how language is an important aspect for teachers to think about as the language needs to be suitable to the age group of the children. The next aspect to the knowledge quartet is connection, this aspect states that teachers should be able to make connections between different processes, ideas and concepts. A teacher should be able to make a connection between the children who do not understand and be able to create new ideas in order to help them gain an understanding. They also talk about how a teacher should be prepared to deviate away from the lesson that is planned when it is appropriate to do so. If this was to happen then the lesson would go off plan because of something a learner had mentioned. This would be allowing the children to guide their own learning which is something that is encouraged by Donaldson (2015) and John Dewey who believed independent thinking and learning should be fostered, (Pound, 2005). Bates (2016) states that according to Hattie the ideal learning state is when learners become their own teachers and teachers become learners of their own teaching. According to Bartlett and Burton (2016) the constructivism theory would fit here as they believe that a teacher should create situations for learners that aid them in constructing their own learning. The final aspect that Rowland, Huckstep and Thwaites (2003) discuss is contingency this aspect revolves around the concerns of classroom events. These

events that occur are deemed as impossible for a teacher to plan for and it is about thinking on your feet to respond to children's ideas which the teacher may not have thought about. This is where a teacher would need to know a great deal about the subject they are teaching as, if a question was to be asked where the teacher did not have the knowledge, this could cause confusion in the lesson. According to Rowland, Huckstep and Thwaites (2003) uncertainty about the subject you are teaching could induce feelings such as anxiety which could lead to the teacher not giving the children an effective learning environment.

According to Coe et al (2014) the most effective teachers have deep knowledge of the subjects they teach and when this subject knowledge is below a certain level a significant impediment to the students' learning may occur. Donaldson (2015) states that subject knowledge has stood the test of time and remains the best path to a sound and relevant education. Although he also states that it is not just this attribute that makes an effective teacher or an effective learning environment. Donaldson (2015) argues that a focus on the expected outcomes of learning also needs to be embedded into the classroom as it is not just the subject knowledge of the teacher that matters. This would coincide with the Knowledge Quartet theory as the writers believe that there is more than one aspect that teachers need to consider in order to be an effective educator, (Rowland, Huckstep and Thwaites, 2003). The Donaldson Review (2015) states that there are many elements of good teaching and these are, methodological expertise, sound classroom craft skills, an understanding of the social and psychological factors that can influence learning and the ability to excite and inspire their learners not only to want to learn but also to be able to learn independently. In agreement to this Coe, et al., (2014) discuss how to be a great teacher you must adhere to six different components. A good quality of instruction, you must be able to instruct the learners in a way best suited to their age range and as previously mentioned children can learn differently so it is important that the teachers instruction is understood by every child. According to Arthur and Cremin (2010) for this to happen a teacher may need to differentiate the vocabulary or examples shown meaning they will need to have expert knowledge of the subject they are teaching for them to be able to adapt on the spot. According to Hattie (2009) teachers need to provide their learners with clear learning objectives which need to be clearly understood by every child before any knowledge can be passed over.

Hattie (2012) discusses how his approach to teaching allows the class teacher to be able to visibly see if a child is learning or not by observing and then have different ways where they are able to intervene to ensure that effective learning is taking place. Holt (1984) believed that a teacher's role should be to facilitate a child's learning and not to interfere with it. He thought that the best approach would be to guide a child in their learning and not tell them what it is they should be learning. In agreement with this the Welsh government (2012) states that children should be able to feel a sense of belonging within the classroom by the teacher involving them with their learning as this gives them a sense of belonging. Aubrey and Riley (2017) states that this is an important aspect of school life as without it children can start to feel self-conscious and lack motivation in turn their school work may deteriorate. Whereas, Barrow (2011) states that a teachers job should be to control and manipulate their learners into learning what they think is best. This opinion would also be in contrast to that of what Donaldson (2015) states in his review as he believes that children should be able to control their own learning and be encouraged to make their own choices so that they can become independent learners.

Critical analysis of subject knowledge

Having never taught in a primary school setting before, I was nervous about starting my PTE. The only previous knowledge I had teaching children was when I taught ballet and my subject knowledge of this was extremely effective after having sat every exam and passing the majority of these with a distinction. After observing the class it was clear that they had chosen this term's theme to be based around space, of which I had no previous knowledge to be able to confidently teach the children about this subject I had to learn about it myself first. I had to do a lot of research to be able to pass on and allow the children to gain an understanding of the solar system. The first lesson I taught was a maths lesson, this was something I was nervous about as maths has never been a strong subject of mine. The classroom teacher told me that it would be my role to introduce measuring to the children using a ruler and in cm to the class. As it was my first time to teach I was given little groups to take outside of the classroom. I had never found maths a fun subject so I did not want this to be portrayed in my teaching. So in keeping with the theme I planned a

lesson on measuring how many blocks the aliens from space could fit into their mouth. I wanted to make sure the children understood what it was they were doing so I made a small PowerPoint for my introduction and then we carried out a physical hands on activity together. I had in mind John Dewey during my planning as he believed that children learn best when they are physically participating in an activity, (Pound, 2005). The learning objectives for this lesson were to ensure the children knew to start from 0 on the ruler before measuring using standard units. This was the main focus for me during the focus task and as some of the children could not grasp that they needed to start at 0 I adapted the lesson by placing a circle sticker on the rulers these children had. This then gave them a visual reminder of where to start the measuring from on the ruler. I had not thought of this beforehand but as I noticed some children were struggling I thought it may be an effective way to aid them in their learning. Whilst observing these children using the stickers it was clear to see that the visual aid had helped them as they were now starting to measure from the correct place. As I had created the resources myself and I had a good understanding of the learning that should take place I felt that I was in control of the lesson. The children seemed to be engaged throughout the lesson and got involved in the discussion within the focus group.

The next lesson I had to plan was based around space facts, I was worried that the children would ask me a question and I would not be able to answer it so I made sure that I knew the majority of facts about the different planets. For this lesson I was teaching the whole class and it was for my first observation lesson, I had put together a number of different resources but the main task was a space quiz. During the introduction of the lesson the children used YouTube to sing a solar system song which would aid them in the activities that were set out for them. Whilst going through some facts on the carpet one child did ask me a question that unfortunately I was unable to answer. To overcome this I remembered that the new curriculum had a focus on digital competence and I told the children that we could find out the answer together using the computer. This would coincide with the fourth aspect of the Knowledge Quartet which is contingency. Here I thought on my feet and was able to keep the lesson on track whilst still answering the child's question. Which would then allow the child to grow and gain confidence because they were not made to feel irrelevant, (Aubrey and Riley 2017). The children seemed to engage with this

and wanted to use the computer to find out more facts. This then led me to use QR codes in my next lesson for the children to use the iPads to find out information and to watch a rocket launch. If in my original lesson I had known the answer to the question then my second lesson may not have had the ICT element included. Meaning the children would not have been able to participate in a lesson that used a cross-curricular approach whilst still including the chosen topic. As I had no previous knowledge of space or the solar system I believe that without my own research and learning of the subject knowledge I would not have been able to teach the children anything that would have benefited them within this topic. Which according to Pollard and Bourne (1994) it is important to be an expert in subject knowledge in order for learners to be able to reach their full potential. Without researching and gaining an understanding of space myself I would not have been able to plan or take a lesson based on this subject knowledge. To plan a well-structured lesson on a topic it is clearly important to know the subject well to be able to create activities that are well suited for the children within the class. Some activities may need to be differentiated for certain children depending on their ability so it is important that the teacher both knows their children and has an understanding of the subject knowledge so that they are able to adapt any activities. Shulman (1987) states that adaptation is the process of fitting the subject knowledge to the characteristics of the learners. With the new curriculum coming into place teachers need to be able to adapt their teaching to keep up with the changes. This shows that a teacher's subject knowledge is always growing. Drake (2005) states that within the foundation phase it is important that the curriculum is broad but also balances to enable the children to develop skills, attitudes and knowledge. This would mean that a foundation phase teacher would need to have a deep understanding of more than one subject so they are able to teach across the curriculum effectively.

For another maths lesson I taught I had planned on the basis that the classes would be swapping which is what normally happened for maths. The morning of the lesson just before it was about to start the other teacher told me that we wouldn't be swapping due to rehearsals for the Christmas concert. This made me feel a little anxious as I had not planned for the higher ability children within my class because I thought they were going to be going to the other class. Again I had to think on my feet here to ensure that each child was able to participate in an effective learning

experience. Previously I had created a snakes and ladders game where children needed to roll the dice and then answer the subtraction question to decide if they were able to stay on the square or return to start. I had this with me on this particular day so I decided that I would sit the higher ability children on a table of their own where they would be able to pair up and play this game. I knew that it would be an activity that would push them but they would be able to complete it as long as they worked hard. The children seemed to be interested in the game and wanted to quickly get started, I explained to them the process of the game and that they needed to document their answers to each sum neatly on the piece of paper I provided them with. After reading through the Knowledge Quartet it is clear to see that I had used a few of the steps without knowing it. I used the foundation aspect because I believed that the children still deserved to participate in an effective lesson even though I had not planned to teach them in my original plan. I also used contingency aspect as these events were out of my hand and impossible to plan ahead for. I had previously created the snakes and ladders game and had the resource with me in case I could use them and they fitted in well with the theme of the lesson already and the children were engaged. I was able to observe the children playing and as they were in the higher ability maths group I was happy to see that I was able to still provide them with a lesson that was beneficial to them. I then went back to the other children to teach them the original lesson I had planned, it was still about subtraction but I had created an easier work sheet for them to complete. Whilst the lower ability children were going through the work sheet I went back to the higher ability table to see how the children were getting on. They were working extremely hard and seemed to be enjoying the competition aspect of the game and were trying to answer their questions quickly. I noticed that the other partner would then check their answer to make sure it was correct before letting them roll again, this was something I hadn't asked them to do and I was going to check their paper once the lesson was finished to make sure they had grasped the concept of the game. I did this anyway and the children had answered their subtraction questions correctly, with some mistakes that I could see had been changed to the correct answer. On reflection of this lesson I could see that John Dewey's theory had taken place and the children had learned better through physically participating in the activity. They had also taken it upon themselves to ensure their partners were

learning which would coincide with Donaldson (2015) as they had built upon what I had taught them and created their own learning.

Conclusion

It is clear to see that subject knowledge is an important aspect needed to become an effective teacher. Without it research shows that children's learning suffers if they are not getting the best out of the lessons where teachers are not sure of the subject. This research has shown that there are also other ideologies that should be considered and taken on board whilst in the classroom environment. These are classroom management skills to ensure the children know how to model the desired behaviours, efficient use of lesson time, and to coordinate classroom resources, (Coe, et al., 2014). Another aspect is the quality of the instruction that the teacher gives the learners. This is important because if the teacher explains the subject using language that the children do not understand then no learning will take place. According to Coe et., al (2014) there is strong evidence to suggest that this has an impact on the learning outcomes of each individual child. After my PTE 1 it has become very clear to me that I need to continue to build on my subject knowledge, as I will be going into a year 3 class for my second placement I will also need to build on the language skills that I will need to use for slightly older children as I will be going into key stage 2. Another aspect I need to work on is classroom management as the children will be older I think I will need to adapt new techniques to ensure the children model the desired behaviour.

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