

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

Introduction

The relationship between the teacher's subject knowledge and the students' learning in the primary school can relate in many ways and have arguments for and against the need for subject knowledge to teach and to have effective outcomes. Basing my knowledge and experiences from placement and bridging opportunities in a range of schools, from a piloting pioneer school, a school in a deprived area, to a local community school along with literature I have read, I will show my understanding and analysis between the relationship of teaching and subject knowledge, and if it has an effect on learning. I will demonstrate this analysis and understanding, critically and effectively through a literature review and through an analysis and evaluation of my own subject knowledge in this essay, relating both literature and my own experience and knowledge where appropriate and necessary. The information and experience first-hand is based from the schools I have spent time in as a trainee, these classrooms include children with learning difficulties, children of different backgrounds, different learning levels within their class as well as children with English as an additional language. By following BERA (2018) guidelines, I will keep all schools and children mentioned throughout anonymous. The main focus from my experience will be from the most recent placement where I was able to teach and not just the observations I have made, although these are important also. During my time on teaching practice, I was in a community school in a class of children ages 4 and 5, which will be my main basis for the analysis and evaluation, linking to research found and information shared in the literature review. I will start with an in-depth literature review, exploring different studies and research relating to subject knowledge and learning in a primary school setting. I will compare my findings to each other and find common ground and counterpoints. I will then take that information and analyse it and give my own opinions on the research found, sharing

my own experiences from my training so far. I will also give examples in the appendices of lesson plans and self-evaluations to show to relate to the experiences spoken about throughout. I will then conclude, bringing points together and sharing anything I have found out during my research that I will bring forward in my next teaching practice.

Literature Review

Wales has an upcoming curriculum reform, known as Donaldson's Successful Futures (2015). This reform explicitly expresses the need for subjects to be approached with a cross-curricular view and to interlink all subjects to form a cohesive and rounded education (Donaldson, 2015). For Wales, the following literature may need rethinking in terms of what will be expected from teachers once this reform is in full effect, or it may be a time when subject knowledge is more pertinent than ever.

Reading Findings.

The knowledge quartet consists of four main areas or stages to a teacher or trainee's subject knowledge. These are the foundation, transformation, connection and the contingency. According to the knowledge quartet, the foundation to subject knowledge is based off previous knowledge from the teacher and what they have learned, their beliefs which transfers their values relating to the subject, also the conditions in how the subject is taught, for example, who is being taught and how they like to learn best (Rowlands, Huckstep & Thwaites, 2003). The transformation is the subject knowledge in action, demonstrated by the trainee or teacher's planning and the teaching happening, with importance for the content being taught to use examples that best support the subject being taught (Rowlands, Huckstep & Thwaites, 2003). As for the third element, connection, this stage is self-explanatory, it is the binding together of the knowledge and the way of teaching, making sure that coherence and understanding are developed, it is especially important this is developed through a series of lessons as well as there being fluid way of learning for the students (Rowlands, Huckstep & Thwaites, 2003). The final of the quartet is the contingency stage, this is for the unexpected parts of teaching and things that may

come up that have not been planned for, this aspect of the knowledge quartet is the ability to be innovative in a time of need during the teaching day, when the unexpected happens, having the ability to pull together a lesson from own knowledge and experience (Rowlands, Huckstep & Thwaites, 2003).

Shulman (1987), formed a series of studies to see how teachers formulate their lessons, one study done on Nancy, showed that she uses a format for her lessons to ensure that her templated lessons reduces any surprises or unexpected lessons, this relates to the fourth stage of the knowledge quartet (Rowlands, Huckstep & Thwaites, 2003) – contingency, this way of creating a plan to ensure little surprises happen and it reduces Nancy's planning time when something unexpected occurs (Shulman, 1987).

In a study done by Nick Morrison (2014), he noticed that around the world, leaders and educational governors believe that having good subject knowledge and good pedagogical knowledge make a good teacher, and a good teacher cannot be a sufficient teacher without those two characteristics. With some saying that the teachers need to improve instead of creating variants and differentiation for the children who were weak performers (Morrison, 2014).

In and Ofsted (2008) report, it says that improving subject knowledge is important and this is something of high demand in teachers. A high demand is in force to improve teacher's subject knowledge as well as develop the learner's skills and the ability to understand how children learn best (Ofsted, 2008).

There are six components of what makes a great teacher, with the pedagogical content knowledge being number one according to Robert Coe, Cesare Aloisi, Steve Higgins and Lee Elliot Major in their journal 'What makes great teaching?' (2014). They explain that content knowledge is the most important to effective teaching and if their content knowledge is less than sufficient then attainment can be effected (Coe et al, 2014).

Hattie (2012), believes the best teachers depends on their attitude and their expectations from their learners, and passion is important. In contrary to other theories and professional opinions, Hattie's Visible Learning (2012), shows that teacher's subject knowledge is not directly related to attainment and results. It is,

however, the teacher's ability to understand how the learners in their classroom learn, and applying that to their knowledge and what they have learned themselves (Hattie, 2012). Hattie (2012) expresses that expert and good teachers do not contrast, as they both possess the skills to teach a subject coherently and effectively, that teachers who possess the skill to manage and organise a lesson is far more effective than a teacher who has wide subject knowledge and lacks the skills to teach and assess a situation. The ability to be flexible, spontaneous and problem-solving is some of the attributes that Hattie (2012) believes to be crucial to being an effective teacher. Hattie (2012) recognises that lessons rarely go to plan, and because of this, it is important teachers become experts in improvising, having a contingency, as the knowledge quartet (Rowlands, Huckstep & Thwaites, 2003) states, and that expert teachers are those who can understand when a lesson is not going to plan or is not being received well, and can change and adapt the lesson swiftly. If knowing everything about the lesson, but not having the knowledge to recognise when the lesson is not going to plan and the ability to change the lesson, then subject knowledge is not the main importance (Hattie, 2012). The ability to provoke learning rather than force teaching, is the way to become an effective teacher (Hattie, 2012).

Brant (No date) has similar views to Hattie, in that pedagogy is more important, how to learn and the skills required to teach, rather than the "medieval" views of subject knowledge being the be-all when it comes to teaching. Brant (No date) says that educational has taken on a social constructivist approach where the student is the centre of teaching and learning rather than the teacher being the sole focus.

Bringing Literature Together

Most literature, viewpoints and opinions stand with subject knowledge is crucial to effective learning and effective teaching. The knowledge Quartet (Rowlands, Huckstep & Thwaites, 2003), the thought of Coe et al (2014), the educational governors written in Morrison's (2014) article for TES, Ofsted (2008) and Shulman (1987), all have the same theme that having content knowledge is of most importance when teaching. Although, the knowledge quartet (Rowlands, Huckstep & Thwaites, 2003) and Shulman (1987) both believe that a contingency plan always needs to be in place, if the teacher needs to change a lesson they have planned, this

shows that a teacher who has expert level subject knowledge will still need the skills to assess the learners needs and to know the learners to produce an effective lesson. As John Hattie (2012) may argue, that subject knowledge and the ability to plan an effective lesson based off understanding the learners wants, as well as understanding the skills needed to develop understanding, is the most important element to becoming an effective teacher, that subject knowledge is not the most important part to being an effective or even an expert teacher, but having the skills and ability to produce effective learning over effective teaching is the most crucial part of the profession. Though, most of the literature aforementioned, have similar themes and testimonials, Hattie's (2012) Visible Learning document contrasts the points by expressing subject knowledge is not the most crucial element, although all documents and articles mentioned do have a similar thread running through them; teachers need to improve. Though, many believe that making teachers experts in subject knowledge is the way teachers need to improve, Hattie's (2012) belief is that teachers need to be good in many areas to become efficient teachers, having a range of skills and abilities while having subject knowledge is the way Hattie (2012) believes teachers should be, so perhaps instead of just improving on subject knowledge, other skills need to be improved upon also. And similarly, in the way Brant (No date) believes that education should be student focussed and the sole purpose of education and teachers is the effective learning that takes place and not, contrary to other beliefs, the subject knowledge the teacher possesses, but rather the skills the teacher must have to ensure effective learning takes place.

Though many of these readings have been in different contexts, such as from a mathematical standpoint, a study from the United States or from decades ago, the focus and conclusions of the texts have been that subject knowledge is crucial to attainment, effective learning and effective teachers – besides Hattie (2012) and Brant (No date) who believe that effective teaching is more than subject knowledge, but it is about pedagogic knowledge and skills.

Implications and Other Factors.

Teachers' can often experience anxiety if they feel their subject knowledge is not enough (Rowlands, Huckstep & Thwaites, 2003). The high demand from governors

(Morrison, 2014), Ofsted (2008) and other theories found in literature, such as the six components of what makes a great teacher (Coe et al, 2014), are creating anxieties for teachers, as they have many other things to worry and focus on as a teacher, there is an added pressure that their subject knowledge needs to be better and they need more of it. A discussion held by ncetm (2018) on whether subject knowledge – particularly mathematics knowledge in this instance is crucial to being a good teacher and if implications are made when the teacher does not feel adequate in their knowledge. A few professionals during this discussion revealed that they have felt anxiety around this subject due to the lack of their own knowledge and feel the pressures of knowing all had an adverse effect on their confidence and ability to teach certain areas of the subject (ncetm, 2018). With some professionals pointing out that newly trained teachers are especially anxious when the risk of getting something wrong is a factor (ncetm, 2018). Anxiety around a subject is believed to have an effect on how effective teachers teach (ncetm, 2018). Though, pressures can be put upon teachers to know every subject area they teach, which causes anxiety which can then have an adverse effect on the attainment levels in the class (ncetm, 2018). Ncetm (2018) recommended to use self-evaluations tools to gauge knowledge and to reveal weaknesses and areas of improvement. Turner of Loughborough University and Braine of Trent College (2016) write that wellness knowledge and practice into ones teaching and into teaching education could increase resilience and lower anxiety. Simply stating that ‘teachers need to know how to look after themselves’ (Turner & Braine, 2016). Wellbeing does not only need to be a personal attribute professionals need to attain for themselves, but the institution needs to look out for their professional’s wellbeing also (Turner & Braine, 2016).

Analysis and Evaluation

This section will not only be my evaluation and analysis on the literature but will also be exemplars and links to my own experiences with analysis of personal experiences and incidents relating to subject knowledge in primary school teaching during my teaching experiences so far.

Thoughts Relating to Literature

In my opinion, I do not think it is important to be an expert in a subject but it is important to have general knowledge in all subject areas, I think the key to effective teaching is knowing how the children in the class learn best and using that to the advantage, like Hattie (2012) expresses. I also think that if a teacher has a strong foundation and plan in place, like Nancy from Shulman's studies (1987) and having a contingency as the knowledge quartet points out (Rowland, Huckstep & Thwaites, 2003), then a teacher is able to apply that with their own knowledge and research to then teach that lesson. I especially think that having subject knowledge and being an expert in one subject is not the most important part to becoming a primary school teacher, as we are required to teach all subjects and skills, not just one, unlike secondary and higher education. With the upcoming changes to education, I even see this coming to an end specifically in Wales, as with Donaldson's *Successful Futures* (2015), all subjects will be cross-curricular and require a range of subject knowledge and skills. These can be learned, taught and trained for the teachers to become well equipped when carrying out a lesson. As I have had my own experience of training, I have realised that the importance is knowing children, what works for them, what skills they need and how to keep them safe and healthy, is our responsibility as much as teaching them science or mathematics, so a wide range of skills are surely more important than being an expert in one subject area, having pedagogical skills as well as subject knowledge (Brant, No date).

From the reading I have done, I agree with the knowledge quartet (Rowlands, Huckstep & Thwaites, 2003) and Shulman (1987), in that being a teacher and having subject knowledge comes in stages and is subjective to each classroom and teacher. I particularly agree with Hattie's thinking in *Visible Learning for Teachers* (2012), as I agree and relate to the points made about having subject knowledge not being closely related to having results and efficient lessons, that rather, it is possessing the skills to take information and knowledge, while assessing the class and children involved, to teach a great lesson. I find that Hattie's (2012) points expressing that if a teacher has all the content knowledge but no skills to organise and use that knowledge, then how will that be great teaching, a teacher needs both, but more importantly needs the ability to teach a great lesson based off more than great subject knowledge. We will have stronger subjects and weaker subjects, but it

is our duty as a teacher to be able to apply our skills to create a lesson that works for the learners to effectively learn rather than as a teacher, effectively teach.

Own Subject Knowledge

My own subject knowledge is not fast and I would not claim to be an expert in any subject in particular. I am willing to learn and expand my knowledge as I grow as a teacher, to learn when I am unsure of a subject and to always ensure I have a contingency in place, especially for subjects I am unsure of, as suggested in the knowledge quartet (Rowlands, Huckstep & Thwaites, 2003).

As part of my teaching experience, I realised my strengths and weaknesses in terms of teaching style, subject knowledge and capabilities. I could plan arts and craft lessons with ease for the additional adult, and found myself full of ideas and knowledge for that subject area. So, I felt I wanted to allow myself to plan for lessons I felt I had lesser subject knowledge on, such as mathematics. I also did not have the opportunity to plan for other subjects such as religious studies, geography, science and ICT to great extents, so will be concentrating on these subjects for knowledge development in my next placement coming up. For the majority of lessons, my subject knowledge was sufficient, but considering the age group I was teaching, my subject knowledge was not required to be to great extents. My previous experience visiting and observing a year 6 class confirms that my subject knowledge will be stretched at different points of my upcoming career as a teacher, but I am prepared with the knowledge of how to research and am well-equipped with techniques to help me, as I am sure I will come into situations where I will need to learn new topics and broaden my knowledge. This again relates to the contingency stage of the knowledge quartet (Rowlands, Huckstep & Thwaites, 2003), being well equipped and prepared for situations that will come up is the key to effective teaching.

Own Experiences

From Nick Morrison's (2014) article and the claims from professionals and educational governors, the statement that stood out most to me was that teachers subject knowledge needed to improve instead of differentiating for weak performers. I half agree with this statement, I disagree that variant lessons and work needs to be

given, children need differentiating when doing work, in my experience. I believe that no matter what I was teaching, not every child could do the same level of work, no matter how confident I felt in that subject, and how confident I felt my knowledge is. The part of this statement I do agree with is that teachers need to improve, but not in the way that this statement most likely entailed, but in a way that Shulman's (1987) case with Nancy showed, and that is having a contingency in place to improve teaching skills and her lessons.

From my own experience, I always ensured that I differentiated my lessons to fit the children's needs and levels. In a few instances during my placement in the reception class, I planned a lesson and unfortunately, I could see it was not going the way I had planned or foreseen it going. I needed to work hard to readapt my lesson in a very swift and effective manner, ready for the next session and group. Although, I did not have a set or rigid contingency plan as suggested by Shulman (1987) and the knowledge quartet (Rowlands, Huckstep & Thwaits, 2003), I was able to adapt and come up with a plan easily and quickly enough due to my knowledge revolving the lesson. I self-assessed this lesson and reflected on what happened, what could have been avoided and how I will progress (see appendix 1).

Although my subject knowledge generally revolving the subject at hand this day would necessarily by my strong point, I knew the lesson well and knew how to adapt. This, personally, is subject knowledge that matters, rather than being an expert in the subject, but rather, to be an expert in your lesson, so if plans change or the day brings something unexpected, you are able to adapt quickly and continue with learning. This incident only proves my earlier points that knowing how to allow the learners to learn rather than knowing how to teach is more efficient (Hattie, 2012) and how having the ability to adapt and think on my feet (Shulman, 1987 & Rowlands, Huckstep & Thwaite, 2003) is more effective when in the classroom than having an expert level of knowledge in a subject.

Conclusion

In conclusion, the literature and reading I have done revolving the importance of subject knowledge in the primary school mainly point to, yes, it is extremely important and it is in fact, the most important skill to have as a teacher. Though, Hattie (2012) and Brant (No date) would disagree, that having other skills and

general subject knowledge is much more important and having the ability to enable learning should be a teacher's focus.

Though, so many points made throughout this essay were that subject knowledge is the most crucial part to effective teaching, the points I will be taking forward are that subject knowledge is important, but so are the skills needed to enable learning (Hattie, 2012), the need for teacher's wellbeing to be looked after (Turner & Braine, 2016) and that a contingency plan (Rowlands, Huckstep & Thwaite, 2003) is always a smart idea to have in place, as from experience and from reading, lessons do not always go to plan. I plan to also expand my subject knowledge, because even though having other skills is important, I do believe having subject knowledge in a general sense will help with planning and future implications that may occur. This will also help reduce any future anxieties I may have around subject knowledge and reduce the risk of my own well-being and mental health. As during an incident mentioned above, I did experience a moment of anxiety, which from reading is very common in trainee teachers and in newly qualified teachers (Rowlands, Huckstep & Thwaite, 2003; ncetm, 2018; Turner & Braine, 2016). This is something I do not want to occur in my future career over subject knowledge, so plan to work on my personal well-being in relation to subject knowledge by adopting some mindfulness techniques as well as ensuring I am constantly learning alongside my students.

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Appendices

Appendix 1.

Assisted Reflective Conclusions (ARC) Model

Date: 5/11/18

Critical incident (focus): Focus task – addition up 5 or 10. (reflecting on first group and adaptation made)

<i>Experience</i>	
Feelings <i>"What are your feelings regarding the experience?"</i> Remember and Understand <i>"Can you list the aspects of the learning experience that went well?"</i> <i>"What were the elements of the learning experience that were disappointing?"</i>	- Overall, the focus task went well and was effective as the children could recognise that adding to another number will make it larger and have an outcome. - The task had to be adapted slightly, as when I first did the task with the highest ability group, it was not engaging like I had hoped and it was not as effective as I thought it would be when planning. I had to adjust the task before the second group and the adjustments were more effective and were the right thing to do. - After the adjustments, the task became more engaging and the children understood the task better. - The children understood that they were counting the shapes to result in a number, but did not fully understand that they were adding, apart from a select few. But this was their first introduction to addition so overall, they did well. - Having a demonstration led by me to start the task was effective and went well with the task, allowing for an understanding before referring to the pictures on their work sheets provided. - When learners encountered difficulties, I demonstrated to them again to refresh their knowledge and this helped them to continue with their independent work. - The resources worked well as the children referred to the laminated rockets to copy the number formation to answer the questions when they found numbers difficult. - The learners engaged the way they did... at first the learners were not very engaged and found the task boring, this was before the adjustment. In my opinion, I can sympathise to why they thought the task was boring. This I took into consideration when adjusting, which made the task more engaging. Once the adjustments were made the children reacted more positively and understood the task better. - The main areas of development were number formation and understanding 'how many altogether?'. The children were showing some understanding but as it is their first session on addition, there is time to improve.

	- I drove the learning overall, through the demonstration, but the children were encouraged to work independently and to ask peers when they were stumped. I also took responsibility for marking and tracking the children while they worked. - Elements of the focus task that were disappointing was at the start of the task, before adjustments were made. The disappointment was that the task I had planned was not engaging, nor was it going as I had imagined. This is due to them writing in their books with just the numbers written and no visual aid. When I had the children try the sums on the laminated pages I had, they engaged much better, this resulted in me adjusting the task for the following groups with just the sums I had with visual aid and numbers to give them better understanding, when I did this it worked much better. The first group will have the opportunity to revisit the task with the adjustments again tomorrow to allow engagement and understanding.
Evaluate and analyse <i>"What will you keep the same to ensure effective teaching and learning in the future?"</i> <i>"What was the cause of the most important disappointing element?"</i>	- To ensure effective teaching, I will ensure that the task has visual guidance to help the children, particularly when it is their first time on the subject. - The cause for the most disappointing element was that I did not take into consideration that it was the children's first time doing the activity, so a more visual version would have benefitted – and did when I altered it after the first group. - Others may think I have developed in my teaching skills from the start of the task to the end of the task by the way I thought on my feet and adapted the task when I saw it was not going as planned.
Conclusions and actions <i>"What are your possible solutions to the disappointing issues identified?"</i> <i>"What will you do next?"</i>	- Though I resolved my main disappointments quickly and effectively during the task itself, I could improve in the future, by thinking how it could possibly go wrong before it happens, allowing time to adapt before having to adapt quickly during the lesson/task. - I will use this reflection to move forward by making sure I think of how the task could be adapted if needed, and how there could be issues with the task I have planned and be critical on my plans to hopefully avoid adjustments during the task.
<i>Transformed experience</i>	