

This piece of writing will critically draw conclusions based on the Welsh Government expectation that literacy, numeracy and digital competence will be cross-curricular responsibilities in the new curriculum in Wales. Reference will be made to the influence cross curricular pedagogies have on the progress of learners and how it links to the future in Wales. This essay will discuss cross curricular responsibilities focusing on the impact teacher subject knowledge has on cross curricular pedagogies. Personal reflection will be made with conclusions drawn towards personal targets and recommendations for those involved in education in Wales.

Hayes (2010), and Barnes (2015), define cross curricular learning as the combination of knowledge, skills and attitudes of numerous disciplines integrated to a single theme, experience or problem. Learning across disciplinary traditions is not a progressive or modern idea, as philosophers and educationalist such as Frobel (1826), and Comenius (1967), all discuss experiences understood through a number of subject disciplines. The Ploweden Report (DES, 1967) claimed that dividing the curriculum into subject areas can disrupt the train of thought and hinder children from identifying the foundations of problem solving. Gardner (2006) and Hirsch (2006), argue the significance of learning specific subject knowledge and skills. However, Gardner (2006), views the regular combination of subject skills as necessary for transferable learning, while Hirsch (2006) debates for a pure knowledge curriculum of complete separation of subjects. However, the National Curriculum was divided into 12 subject areas creating an overcrowded but narrow primary curriculum (Rose, 2009). The Rose Review (2009), continues to be valid when reflecting on the developing curriculum in Wales, as the six areas of learning recommended by Rose (2009), similar to those of Donaldson (2015), were rejected in England and Wales but adopted in Scotland and Northern Ireland. One of the many causes for change in the current curriculum in Wales, can be seen in the results of the PISA surveys showing that performance in Wales is low and current methods are unsatisfactory (OECD, 2014).

The Welsh Government presented the National Literacy and Numeracy Framework (LNF) in 2013 as a response to concerns regarding pupil progress, aiming for well-developed literacy and numeracy skills being a way to enable learners to meet the demands and opportunities of the 21st century (Welsh Gov, 2017a). To ensure parents were involved and aware of changes in their child's educational journey, some schools provided an outline of the framework and provided specific skills for each year group on their websites (Roath Park Primary School,

2018). Despite some schools in Wales making steady progress implanting the LNF, the Welsh Government (2015), notices how additional measures need to be put in place to allow literacy and numeracy skills to be implemented in a meaningful way across the curriculum, and will resume to focus on literacy and numeracy as an indispensable requirement for the new curriculum.

The Welsh Government set out Our National Mission 2017-21 (Welsh Gov, 2017b), central to the mission is ensuring that learners have high level digital skills and are digitally competent. As a result, the DCF has been introduced and digital competence is seen to have a progressively influential role in the lives of learners who inhabit a digital world (Donaldson, 2015). Donaldson (2015) notices the significance of cross curricular learning and the importance of literacy, numeracy and digital competence. One of the twelve pedagogical principles of the new curriculum involve reinforcing the cross curricular responsibilities and providing opportunities to practice them (ImpactWales, 2018). One of the barriers to ensuring pupil progress in literacy, numeracy and digital competence is ensuring that the curriculum is devised in a way that engages the learners (Donaldson, 2015). Cross curricular approaches could be a successful solution to this as Barnes (2015), Rowley and Cooper (2009), Kerry (2011), and Faultley and Savage (2012), argue that cross curricular methods can be a successful tool to increase motivation, sustain interest and raise standards.

In contrast, Literacy and Numeracy has been seen as a priority in the National Curriculum with cross curricular links and increased time given to Mathematics and English after 1997 (Ofsted, 1998). However, the importance of digital competence referred to as ICT, was omitted in the 2014 primary curriculum with Estyn (2013), recommending that the Welsh Government needed to analyse the National Curriculum and Skills Framework for ICT to guarantee relevance remains. Ensuring cross curricular links are relevant and only used enhance children's learning should be a key priority to in incorporating literacy, numeracy and digital competence as cross curricular responsibilities (Alexander, 2018 and Barnes, 2015).

This was also identified during Professional Teaching Experience (PTE), where LNF skills were perceived as being more important and easier to incorporate successfully than the skills from the DCF. Personal observation and interactions from PTE found that teachers were far more confident in incorporating Literacy and Numeracy in a cross curricular manner than

digital competence. This could be a result of literacy and numeracy being a key focus of the curriculum in Wales for many years, and digital competence being a relatively new focus that not all teachers are fully confident in delivering. The Welsh Government notice the lack of confidence teachers relate to digital competence and delivering the DCF, they have introduced the Digital Professional Learning Framework (DPLF) to provide support and guidance for teachers (Welsh Gov 2018). However, reports show that 21% of primary school teachers view the workload required as a very serious problem, and 50% view it as a fairly serious problem (Department for Education, 2019). Despite tackling the workload teachers face, being a priority for the Department of Education and the education sector (Department for Education, 2019), considering these statistics, it is it is questionable if introducing the DPLF will benefit teachers in the classroom or just add to their already stretched workload.

Developing teachers subject and pedagogical knowledge can be fundamental to achieving successful cross-curricular teaching. Barnes (2015), explains how teacher's need to value subject knowledge and be familiar with the individual lens each subject offers for cross curricular teaching to enhance children's learning. Pollard (2010), highlights that teachers need to show a responsive, creative and intuitive style to increase the unexpected reactions of learners. This was evident during PTE where the class teacher was a very experienced Foundation Phase professional who was able to link ideas from different areas of learning, follow the children's lead and incorporate the children in the planning. These are all pedagogical skills from Pollard (2010) list A, B and C, which Pollard believes are key for effective cross curricular teaching. Personal reflection from PTE identified that at the beginning of the placement it was challenging to meet any of the skills in Pollard's (2010) pedagogical skills list, but towards the end of the placement with increased confidence and guidance from an experienced mentor, skills were being met from the list in order to develop children's literacy, numeracy and digital competence as cross curricular responsibilities. Personal observation found that when involving learner's in the planning of lessons, especially the provisions in the Foundation Phase helped them to stay motivated while on task and develop their literacy, numeracy and digital competence skills in both the focus tasks and in the enhanced provisions. Pupils being involved in the planning process, originated from constructivist learning theory (Littledyke and Huxford, 1998 and Fisher, 2002), suggests and supports that children should have ownership of their education (Cheminais, 2006). The four purposes of the new curriculum emphasize the need to develop children's capacity and confidence to learn throughout life (Donaldson, 2015). This will be strongly

subjective by the way children are taught and their attitude towards education. Donaldson (2015) views good teaching and learning as children taking responsibility for their own learning and being aware of how they can be supported to reach their future goals.

This is also supported by Hattie (2012), who argues that skilled teachers hold understanding that is more integrated, and have the knowledge to add the introduction of new subject learning with what learners already know. This then creates concern that cross curricular teaching especially of literacy, numeracy and digital competence are most effective when delivered by experienced teachers. This was acknowledged by Estyn (2017), who identified the weaknesses in the quality of teaching to advance numeracy is frequently due to teachers own lack of mathematical knowledge and confidence to correct children's misunderstandings. As a result, pupils made limited progress, and in some cases, became more confused (Estyn, 2017). This is not a new finding, Briggs (1993), argues that several teachers experience feeling anxious and nervous when teaching mathematics, with Haylock and Cockburn (2008) developing this explaining how teachers can be very aware of their own shortcomings in mathematics. Didau (2014), explains how personal feelings towards certain things largely determines how successful we will be. Personal relation to this theory was experienced during PTE when asked to incorporate a numeracy skill in which I lacked confidence into a science lesson. Individual revision was carried out prior to the lesson to ensure my own inadequacies did not hinder the learning or the quality of the lesson. Despite spending an excessive amount of time revising the numeracy skill, feelings of panic and anxiety escalated and the lack of confidence resulted in hesitance in addressing the children's misunderstandings and questions related to the skill. This highlights the significance of teacher subject knowledge in incorporating, numeracy as a cross curricular responsibility as Burnett and Winchmen (1997), claim that teachers' own attitude and feelings towards mathematics can be distributed to the children they teach.

With one in six people in the UK having literacy levels below the level expected of an 11-year-old (Didau, 2014), supports the need for literacy to be incorporated as a cross curricular responsibility. To allow the next generation to have much higher literacy levels, it is crucial that teachers have sound subject and pedagogical knowledge. Alexander (20014) claims that oracy is the starting point to learning and when summarizing five kinds of talk, indicated that scaffolded dialogue and discussion have the largest potential (Alexander, 2018). Conversely, dialogic teaching demands teachers to have comprehensive subject knowledge and

understanding to be most effective. The connection between dialogic teaching and assessment for learning is not an accident. Dialogic teaching and assessing overlap, it engages and enhances pupils learning while informing the teacher and the pupil about progression and what the next steps need to be (Alexander, 2014).

The aim for successful cross curricular literacy, numeracy and digital competence is to find the skills within each Area of Learning and Experience (AOLE), they would become inseparable (Didau, 2019). However, reflecting upon PTE, when planning lessons, the cross curricular responsibilities were not always easy to incorporate and some were easier to develop than others. Feedback from mentors and current personal targets include to ensure cross curricular links especially from the DCF, are used to enhance children's learning and not there to simply 'tick a box'.

The significance of developing teacher subject and pedagogical knowledge is vital to the progress of cross curricular teaching. Barnes (2011) identified five models of cross curricular teaching and learning, these include; hierarchical, multi-disciplinary, inter-disciplinary, opportunistic and double focus. Barnes added to this taxonomy to incorporate tokenistic, single-transferable subject learning across the curriculum and theme based. However, for any model from this taxonomy to be successful, studies claim that subject integrity and progression is best confirmed by preventing the subjects to two or three in cross curricular work (Barnes and Shirley, 2007, Jacobs, 2004 and Roth, 2000). Many of these models can overlap and projects can involve several models from this taxonomy. Conversely, Barnes (2015), explains how if a theme is chosen that has relevance and is authentic can allow progression in a number of subjects not just the two or three that are suggested for cross curricular teaching. Donaldson (2015), also discusses how good teaching and learning relies on access to high quality, authentic information from a variety of subject disciplines. This may suggest that a theme based approach may strongly be adopted in Wales, as reflection from PTE shows that many schools find theme based learning a successful means of engaging the children and incorporating a range of subject disciplines.

Despite the importance of the cross curricular responsibilities, and the LNF and DCF being introduced, Estyn (2018), found that a quarter of the schools inspected need to develop the planning for pupils to develop their literacy, numeracy and ICT skills across the curriculum. One reason for these findings could be due to teachers' subject and pedagogical knowledge in incorporating literacy, numeracy and digital competence across the curriculum.

Reflecting upon a wide range of research discussed in this essay, it is clear that teacher subject and pedagogical knowledge has a significant impact on incorporating literacy, numeracy and digital competence in the new curriculum in Wales. In order to ensure the successful implementation of the new curriculum in Wales, personal targets have been set in order to make sure that the cross curricular responsibilities are incorporated successfully. To ensure confidence in delivering the DCF throughout the primary school, a digital competence audit was taken through HWB to identify areas of strength and weakness. This has enabled me to identify any weaknesses and given me a clear starting point on what needs to be developed, to ensure I am able to model confidently good practice to the children that I will teach. This will also go towards achieving the QTS standard which involves; “the Professional Learning Passport influences the ongoing critical reflection and learning of the teacher and is developmental in prompting further professional growth” (Welsh Gov 2017c, p.50). . As my chosen phase is the Foundation Phase, I have set the target to research ways in which numeracy can be delivered creatively in the classroom to ensure progression. This will develop my pedagogical knowledge and increased confidence in developing numeracy skills across the curriculum. Alexander (2012), views talk as essential for children’s thinking and learning, and to their engagement with classroom life. Talk is also cognitive, the way we speak changes the way in which we think (Alexander, 2012). One of the best ways to develop talk is by questioning. I aim to familiarize myself with a range of questioning techniques such as the Socratic method in order to develop children’s oracy skills which are often undervalued (Didau, 2014). This will also help in developing children’s understanding of other areas of the curriculum. These personal targets, will help to achieve the QTS standard involving; “the teacher demonstrates an increasingly confident understanding of the theories and research about assessment, pedagogy, child and adolescent development and learning relevant to planning and day to-day practice” (Welsh Go 2017c, p.48).

Kirkwood et al (2000), identifies two parts of improving ICT, firstly the professional development of teachers and secondly, access to relevant equipment. This is an aspect that cannot easily be met by teachers alone. The Welsh Government may aim to provide a sabbatical course to develop teachers’ digital skills, similar to the one available to develop teachers’ Welsh Language skills. This could increase teachers’ understanding and allow them to share what they have learnt with other members of staff. However, this would require continuous funding from the Welsh Government, but could be made a priority due to Donaldson (2015), viewing digital competence as just as important as literacy and numeracy.

With student teachers being the ones whom will teacher the future generations, more training could be provided to student teachers on the cross curricular responsibilities, with creative and engaging ideas that could be used in the classroom. The Welsh Government could also allow more time for teachers to work on their continuous professional development, especially in literacy, numeracy and digital competence. This could occur through extra time during PPA or extra inset days provided for extra training.

In conclusion, this essay has highlighted the relationship between teacher subject and pedagogical knowledge, relating to the Welsh Government expectation to incorporate literacy, numeracy and digital competence as cross curricular responsibilities for the future of education in Wales. With the excitement of education in Wales evolving to meet the needs of the future, it is just as important that teachers evolve to meet the needs of children in the 21st century. There needs to be commitment to develop teachers subject and pedagogical knowledge to give them the tools to prepare children for jobs of the future and meet the four purposes of the curriculum (Donaldson, 2015).

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