

Looking forward: A critical analysis of literacy, numeracy and digital competence as cross- curricular responsibilities in the evolving curriculum in Wales.

The cross-curricular responsibilities (CCR) literacy, numeracy and digital competence underpin the new curriculum. Donaldson (2015) believes that the CCR are vital for learners' education to enable them to participate within society and succeed. Barnes (2015) suggests that our current curriculum is not developing learners that to thrive in the current world and the curriculum needs to allow children to succeed by embedding the CCR across the curriculum to give learners rich experiences to enhance their learning (Dewey, 1897). Throughout this essay the critical analysis of the CCR in the evolving curriculum in Wales will be discussed through how the CCR are needed to help with the economic growth of the country and how teachers' knowledge is important in embedding the CCR.

The cross-curricular responsibilities are vital for the economic growth of the country as “around 22% of working-aged adults are functionally numerate” (National Numeracy, 2019, p. 7) and many only have the numeracy skills of that of primary school as children are taught numeracy in secondary school that is never used again. Learners need to be taught more financial literacy such as APRs by giving the numeracy more real-life context with skills that can be used across the curriculum to develop their understanding further (Welsh Government, 2019a). Businesses have seen a lack in numeracy skills in potential employees leaving them unprepared for the workplace so the use of numeracy in a cross-curricular way is vital (National Numeracy, 2019). On PTE the use of addition and subtraction was put into a real-life context in a fruit shop to consolidate the concepts the children had learnt, making it more enjoyable and memorable as they learnt by doing (Dewey, 1938). It also allows for the children to explore numeracy in their own creative way to build their own meanings and to practice outside of school in supermarkets preparing them for the real world (Pound and Lee, 2015). It allows for the children to collaborate and learn from each other (Vygotsky, 1978). However, when putting numeracy into a cross-curricular context the importance of the numeracy declines as the children focus more on playing shop rather than the numeracy as there is no one to correct them if they are wrong (Coe, 2010).

The National Literacy Trust (2019) suggest that “7.1million adults in England don't have the literacy skills they need” and 12% of the Welsh population do not have basic literacy skills (Furlong, 2015) therefore become locked out of the job markets as they are unable to

complete application forms or understand household bills which is a major problem for the economic growth of the country. Literacy is currently seen as an add on with many teachers because of the LNF but Didau (2014) advises that literacy should be at the core of every lesson with oracy at the heart of improving literacy skills through a cross-curricular approach. Estyn (2016) suggest that taking every opportunity to increase literacy skills shows good practice of encouraging oracy such as role play to increase children's vocabulary in order to improve their writing and reading skills (Alexander, 2008). The new curriculum has literacy as one of the CCR in order to “develop, extend and apply” (Welsh Government, 2019b) skills across the curriculum through a variety of activities like shown on PTE, the children completed recipe writing for the cupcakes they made to enable them to see literacy across the curriculum to give it more meaning (Barnes, 2015). On the other hand, developing literacy across the curriculum makes the assessment for literacy more complex as it is embedded and not so obvious to be able to assess (Johnston, 2011).

The increase in the importance of digital competence is due to the raise in new multimedia technologies and our learners going into jobs that have not yet been created. Giving children the skills to use across the curriculum especially digital competence is vital for learners to be flexible in order to adapt to new circumstances making them more employable (Davies, Fidler and Gorbis, 2011). Many businesses have raised concerns that schools are out of date in regard to technologies in the workplace as using technology is a key skill for the workplace so digital competence has become one of the CCR in the new curriculum to increase its importance (Donaldson, 2015). In order to develop learners' digital competence, it must start from a young age to build learners' confidence (Hoz, J., García-Gutiérrez, J. and Mediavilla, D, 2015) and this was seen in a nursery class whilst on PTE where the children learnt about coding a caterpillar to guide him home which the children enjoyed as it was in a meaningful context related to their theme in a cross-curricular way. However, not all schools have the funding to have new technologies which hinders the learners' abilities to develop their digital competence skills. This could be overcome by applying for grants such as The Royal Society partnership grant (2019) and using local businesses to come into schools like the Big Learning Company (2019) to provide workshops for the children.

In order for the cross-curricular responsibilities to be successful in the new curriculum, teachers' subject knowledge needs to be strong to enable the CCR to be used across the curriculum. Gallagher (2017) believes that many teachers have a phobia of mathematics that

needs to be addressed as this leads to teachers avoiding doing numeracy with their learners passing on the phobia of mathematics. Good teaching is based on good knowledge of the teacher without that it leads to weaknesses in the learners' education (Alexander, Rose and Woodhead, 1992). On PTE, the teacher's numeracy skills were weak so relied heavily on a programme called Big Maths and which allowed for easier assessment of the children. However, the children did not experience maths outside of these sessions leading the children not being able to apply the numeracy to different contexts which Donaldson (2015) and Estyn (2017) believe is important to deepen understanding and give better progression. NCTL (2015) believes that universities and teaching colleges needs to increase their students' subject knowledge of numeracy to a good level in order to teach successfully across the curriculum but Edwards et al., (2015) suggests that there is not a clear understanding of what level of subject knowledge is appropriate to be able to teach. Ball, Thames and Phelps (2008) suggest that there are different levels of mathematical knowledge for teaching not all are needed for a primary school teacher however, Shulman (1986) believes there is only three categories of content knowledge. Morris (2001) believes there is not enough time given to the learning of numeracy on teacher training courses as there is so much to cover in order to be able to give the student teachers the appropriate skills in numeracy in order to teach. On the other hand, Initial Teacher Education (ITE) (Welsh Government, 2019c) has raised the entry requirement for teaching courses for mathematics to a minimum of a B at GCSE level, so the student teachers' mathematic knowledge should be at the required level but some students may have left school ten years ago so would have forgotten what was learnt at GCSE.

Teacher's subject knowledge in literacy is vital in order to teach learners to use literacy across the curriculum. Wales' children's literacy levels lag behind the rest of the UK causing major concern for the education system in Wales (Wightwick, 2017). The poverty rates are at a high in Wales (PSE, date unknown) with children coming to school with poor literacy skills resulting in teachers having to learn the skills to be able to teach children at low literacy levels. The teacher's knowledge of literacy is one of the underpinning elements for learners being able to develop their own literacy skills, regulate their own learning and perform to the best of their ability (Rueda, 2011). Teachers need to have high literacy levels in order for them to be able to transfer literacy skills across the curriculum so learners are able to learn in context not just in English lessons (Hyland, 2001) as putting literacy in a context relevant to the children helps to stimulate them (Pappas, Kiefer and Levstik, 1990). Whilst on PTE, in Key Stage 2 English was taught as subject based lessons so when teaching bibliographies my

confidence was low and therefore the children did not develop a deep enough understanding due to my lack of confidence. On the other hand, whilst in Foundation Phase literacy was embedded across all the curriculum exposing myself and the children to literacy all the time which increased my confidence in upskilling the learners' literacy skills and built the learners' resilience (Barnes, 2018). As well as upskilling teachers' literacy skills it could be suggested that teachers team teach to share expertise and collaborate to upskill each other without outside training needed (Kerry, 2011). Estyn (2016) suggests the use of a literacy co-ordinator in the school who can provide support and motivates other teachers to share good practice. However, Hanusch, Obijiofor and Volcic (2009) believe that team teaching affects the relationship between the teacher and the learner as Ramsden (1992) believes that deeper understanding develops from good relationships with learners. It must be taken into consideration that they based their research on higher education not primary education that this is focused on.

Digital Competence is highly importance in this vastly evolving technology world. However, not all teachers are confident in their own digital skills and there is a wide spread of variations in teachers' knowledge of digital competence which results in learners having very different experiences of digital competence (Barnes and Kennewell, 2017). Edwards (2019) suggest that schools are not using professional learning to develop teachers' digital competence in order to be able to develop learners' skills across the curriculum. Donaldson (2015) believes for learners to participate in society fully they need high levels of digital skills to succeed as the future is demanding more digital skills. It is suggested that 70% of the world's economy will be based on new digital platforms so learners need to be taught the digital skills to fulfil jobs that are not even created yet (World Economic Forum, 2019). Whilst on PTE, the use of VR headsets were used for experiencing world war one which was successful in allowing the children to see how they can use digital skills across the curriculum to enhance their literacy skills by enabling them to write about the war. It also allowed the learners to see connections between literacy and digital competence and how they can apply digital competence to different contexts (Wortham, 1996). However, learners need the skills to be able not only use technology but how to create technology allowing them to enhance their problem solving, critical thinking and creative skills (Partovi, 2018 and Estyn, 2018b) and the digital skills can get lost if used in a cross-curricular context when planning is not thorough (Knight, 1993). On the other hand, in another KS2 class, the only digital competence skills I observed being developed was the use of PowerPoint

presentations as the teacher's digital skills were weak as he never had to use technology, so the learners suffered as a result. Hayward (2012) believes that there should be equal access to skills and resources for digital competency for all teachers however, Estyn (2018b) 6 years on are still recognising that there is still a weakness in learners digital skills as many do not have the ability to create technology such as spreadsheets and the need for teachers to improve the way they plan for pupils' use of digital skills. Using digital skills across the curriculum makes the learning more meaningful however, not all schools have the access to technology as a school I was on PTE had two laptops shared between two classes so the children rarely had any opportunities to develop their digital skills due to the lack of resources. Also, I have experienced a school that has had access to a variety of technology such as coding caterpillars, but the children do not understand how they work, and another school invested in the use of chrome books, but the technology never took off.

The cross-curricular responsibilities are to be seen as equal importance within the new curriculum (Donaldson, 2015) however, as a student teachers we are audited for numeracy and literacy on a yearly basis to ensure we are competent but we are not audited in digital competence which portrays that there is not an equal balance between all three responsibilities. The current Digital Competency Framework is outdated in line with the world's technology as schools cannot keep up with the vast changing of technology. Also, the PISA (OECD, 2019) have reported on the results of learners' mathematics, reading and science but do not measure learners' digital skills as obviously as the others, leading many to think that it is not as equal importance for education. However, when Donaldson (2015) created the new curriculum the digital competence framework was the first part to be developed as he wanted the portray the importance of digital skills.

Matthews (2013) suggests that learning in a cross-curricular way focuses more on how to teach rather than what to teach which loses the meaning of knowledge for the learners as you place the child at the centre of the learning which results in them not being able to deeper their understanding. In Finland, their curriculum is based around themes rather than big ideas which is only successful if the teacher's knowledge is fully develop in order to support the pupils' learning (Finnish National Board of Education, 2016). Ysgol Beca have been successful using the cross-curricular approach as a school by embedding numeracy and literacy skills through Science and ICT which resulted in the learners improving their

standards of the skills and taking pride in their work as they were part of the planning process (Estyn, 2018a).

In conclusion, allowing numeracy across the curriculum is vitally important in order for learners to deeply understand the meaning of it in different contexts and making the numeracy more relevant to everyday life. However, the numeracy must not get lost within the context by teaching the numeracy skills separately if they are more complex and then applying it across the curriculum. Allowing teachers to facilitate and observe the learning whilst in role play would ensure that the meaning of numeracy is not lost. The use of literacy especially oracy across the curriculum is needed to build a base for developing reading and writing and exposing the children to new vocabulary in every lesson to enable them to see that literacy is in every area of learning and experience but giving the literacy a purpose in lessons rather than an add on is vital to its success. Whilst using literacy across the curriculum teachers should consider fewer areas of literacy to focus on in sessions to allow for assessment to become simpler. Increasing schools use of technologies is a priority to ensure learners are fully equipped for the real world and jobs that have yet to be created by applying for funding and using local companies. The upskilling of teachers in all three CCR are vital to the new curriculum being a success as learners learn from the teachers. Numeracy is an area of weakness for myself and many other teachers, the government could consider running revision courses with teachers who lack the confidence in numeracy in order to upskill them and through the use of textbooks and online resources I will be practising and learning numeracy to help deepen my knowledge of numeracy. Many children are coming to school with low literacy levels so it could be suggested that local authorities could fund more pre-school nurseries to help increase children's literacy levels and provide training to existing teachers. There is less support provided for upskilling teachers in digital competence, as I left school ten years ago the use of technology in schools has increased and I do not have enough digital skills to provide the learners. It could be considered that teacher training courses provided their students with sabbatical schemes for digital competence to ensure they are equipped to teach learners digital skills. On teacher training courses it could be also a suggestion that student teachers are audited for digital competence in order to highlight areas of improvement needed. Also, it could be considered to use children as digital leaders in schools to help improve teachers' digital skills as some children have better digital skills than their teachers.

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