

**Looking forward: A critical analysis of literacy,
Numeracy digital competence as cross- curricular responsibilities.**

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Introduction

This assignment seeks to critically analyse the three cross curricular responsibilities of literacy, numeracy and digital competence, drawing on personal recent experience in Swansea schools, and the views of relevant authors in the field. It seeks to analyse Donaldson's (2015) challenge for teaching posed by the Cross-curricular Responsibilities, which requires their application to be natural and authentic rather than an add-on. This position requires 'high-quality' teachers which, according to Donaldson (2015), presented considerable implications for the formation and subsequent growth of teachers as reflective practitioners.

Hayes (2010), when analysing the cross-curricular approach within primary education, provided an insightful and balanced review of the position. A decade on, his reported differences of viewpoint with respect to definition and interpretation remain, and his analysis of key aspects from the Rose Review (2009) remains relevant, particularly when reflecting on the currently evolving curriculum in Wales.

Managing National Curriculum content and overload by utilising six areas of learning (Rose, 2009) was rejected in England, but other countries, including Northern Ireland and Scotland, adopted this type of approach. These moves predated Donaldson (2015), which also proposed six semantically similar areas of learning and experience to Rose (2009). In proposing the curriculum structure, Donaldson (2015) stated that there needed to be a promotion of coherence that would encourage children to make connections across different aspects of their learning. This publication also recommended that literacy, numeracy and digital competence should be Cross-curriculum Responsibilities for all teachers and people who work with children and young people.

Differences with respect to definition and interpretation of a cross-curricular approach clearly exist in schools. Reflecting upon recent personal experience as a Foundation Phase TA, and University Professional Teaching Experience (PTE) in four primary classes, there are a visible range of strategies being utilised, which all practitioners claim to be cross curricular. The approaches witnessed were present within Fogarty's (1995) 10 levels of integration,

demonstrating a sense of legitimacy, but not consensus. Barnes (2011) acknowledges this diversity but maintains that cross-curricular methods are a means of promoting learning that are highly motivating for most children.

Adopting a similarly positive stance, the Nuffield Primary History website (2009), in addressing 'cross-curricular learning', confidently asserted that this approach offers a creative way to develop children's knowledge, skills and understanding, while motivating them to learn through stimulating, interconnected topics. Crossing subject boundaries allows for investigations that engage children's imagination and encourages pupils to undertake active enquiry, to show initiative and to discuss a range of subject content. Personal experience from three schools, would seem to confirm that, when carefully planned, this can indeed be the case.

A Personal Perspective on Cross-curricular Responsibilities

From KS2 PTE placements in Year 6, it was clear that teachers had adopted the double focus approach (Barnes, 2015) to cross curricular learning. In both schools, the forthcoming national assessment programmes appeared to dictate the emphasis of teaching and learning. Both year 6 class teachers preferred to teach literacy and numeracy separately in morning lessons. As a student, I was allowed more freedom and time in the afternoon to develop digital competence that provided an additional level of authenticity. I taught lessons on databases in both settings. These sessions, reflecting Payton and Hague (2010), supported the children to make more sense of their world and apply their learning, and were rewarding for the children and myself.

Effective Teaching and Cross curricular responsibilities

Wiliam (2016), summarising findings of teacher effectiveness research, concluded that the most effective teachers are five times more effective than the least effective. His view, which seems relevant to any educational initiative, including the successful implementation of the three cross-curricular responsibilities, therefore requires a sustained effort to improve the quality of teaching.

Underpinning successful cross-curricular teaching, Hattie (2012) stresses that expert teachers possess knowledge that is more integrated, and the ability to combine the introduction of new subject knowledge with pupils' prior knowledge. As part of this they can successfully relate

lesson content to other subjects and change, combine and add to lessons according to both pupils' needs and their own teaching goals.

Hattie (2012) also recognises that expert teachers quickly recognise sequences of events occurring in the classroom that in some way affect the learning and teaching of a topic. This includes being able to detect and analyse pupil reactions and adapt teaching approaches to be more responsive. This will also consider learning progressions that view learning as a trajectory of knowledge that connects knowledge, concepts and skills that is informed by assessment. (Camau, 2018).

Pollard (2010), when considering cross curricular teaching, saw teachers requiring high levels of ability that would draw upon three separate, but inter-related skill sets. Without all the necessary skills, Pollard warned that poor cross-curricular teaching results in fragile, un-transferable and difficult-to-articulate learning.

Creating an optimum classroom climate where this approach will flourish, requires reciprocal levels of trust, between pupils and between pupils and teacher, that accepts mistakes as evidence of a learning process. It also requires teachers who are confident in the three cross curricular responsibilities. However, reflecting on teacher placements, there are teachers who do not possess the same levels of confidence in each of the three responsibilities, limiting the experiences for learners.

Digital competence

Within a Foundation Phase class placement, the class teacher had impressive knowledge and pedagogical expertise in teaching literacy and notably numeracy, but far less confidence with teaching digital competence. Consequently, my teaching responsibility during theme-based cross curricular learning (Barnes, 2015), became directed and heavily skewed towards developing digital competence throughout the practice. This position reflects Grenfell (2002), who argued that cross curricular teaching makes demands upon teachers with respect to their own professional development, as they move outward from their favoured subjects.

Donaldson (2015), viewed involvement in modern society and the workplace demanding high levels of digital skill, that will only increase in the future. This raises questions for professional development and training which were acknowledged within the report, when considering teacher and leadership capacity.

Estyn (2018), reported on how schools were preparing for the Digital Competence Framework (DCF). The 23 schools included, were all considered to be at the forefront of this developing area, including 7 that were designated pioneer schools. From such a strong and unrepresentative sample, it was nevertheless stated, that while schools have mapped the DCF across the curriculum, many digital leads had not decided how to address the issue of gaps in provision. Estyn shared a concern that unless these gaps are addressed, schools are in danger of replicating current inadequate provision in ICT across the curriculum. If this is the position in a strong sample of schools, it would appear that there is a need for an extensive programme of professional development to be planned and delivered across Wales. This position receives further confirmation from Estyn (2018a), who found pupils' standards and application of ICT are a weakness in 40% of primary schools.

Such a programme of teacher professional development took place between 1999 -2002 (Kirkwood et al), when it was recognised at UK government level, that to raise the standard of pupils' achievements, there was a need to increase the expertise of serving teachers in the use of ICT in subject teaching. However, and of fundamental importance to delivering the Donaldson (2015) curriculum in an optimum manner, there needs to be an ongoing recognition that this field continues to evolve at a rapid pace.

Teachers need to fully accept that technology, properly used, can be an asset when making thoughtful pedagogical decisions. In a society increasingly saturated by technology, schools and all teachers must take the lead in teaching as well as modelling the ethical use for their pupils. (Keefe and Steiner, 2018).

Numeracy

By contrast to digital competence responsibility, Literacy and Numeracy are more firmly established within Wales and, theoretically, have been throughout the lives of all teachers. Originally considered as English and Mathematics when the subject based National Curriculum was introduced in 1988, the word 'numeracy', in the words of Haylock and Manning (2014) has had an interesting and varied life! They suggest that in 1999 and, apparently without any justification, The National Numeracy Strategy in England (DfEE, 1999) chose to use the word 'numeracy' synonymously with 'mathematics'. Within England this was reflected in the numeracy hour introduced simultaneously with the literacy hour.

Within Wales the Literacy and Numeracy framework was introduced in 2013, accompanied by specific guidance (Welsh Government, 2013). Some schools provided a summary

explanation of this to parents (Newton Primary School, 2013), with examples of how this might be implemented in the curriculum and the statutory assessment programme that was to accompany this process. The cross curricular approach in this process, was a feature of both publications.

Despite the centrality of literacy and numeracy, and the long-standing position of English and Mathematics in the curriculum, there are aspects of both areas that require development. From a personal perspective, despite passing both GCSE English and Mathematics with good grades, there has been a significant difference in my audits of subject knowledge undertaken in undergraduate training, with the retention of English seemingly far greater than that of mathematics.

Estyn (2018) whilst stating that many pupils apply their numeracy skills appropriately across the curriculum, noted that this does not happen often or well enough in all schools. One year earlier, this position was explicitly expressed as one third of primary schools (Estyn, 2017), and specifically linked to the quality of teaching and a lack of necessary mathematical knowledge and confidence to address pupils' misunderstandings.

Research into primary school teachers' attitudes to mathematics (Briggs and Crook, 1991), reflect negative perceptions among many respondents and a sense of panic and anxiety when faced with unfamiliar mathematical tasks (Briggs, 1993). Haylock and Cockburn (2013), went further, reporting that muddled thinking about many of the basic mathematical concepts which underpin their teaching, were a source of personal concern to a significant percentage of teachers. This research into existing teachers is mirrored by levels of anxiety by trainee teachers. (Haylock and Manning, 2014). Again, this position points to the importance of the Donaldson (2015) recommendation, that an extensive and sustained programme of professional learning should be developed for the skills and knowledge of teachers and other practitioners, to be fully met. Askew (2016) views this increased knowledge and confidence as necessary, to enable teachers to progress from a position of teaching children how to carry out calculations to enabling the children to carry out calculations with understanding.

Literacy

Literacy can also benefit from targeted professional development. Wiliam (2016), demonstrated the relative effectiveness of different teachers, and Hattie (2012) saw the importance of the expert teacher's role in successful cross-curricular teaching. Alexander (2018) drawing on insights from neuroscientific research, confirms the importance of teaching as intervention rather than mere facilitation.

Certain authors have extended the debate about teaching and learning, and only by engaging with and acting on key specialists' recommendations, will professional development provide the levels of focus required to develop not just trainee teachers, but also longer serving teachers. Estyn (2017) often address areas of learning in literacy in quite general terms. Within an annual report they state that the provision of literacy has improved and overall this had a positive impact on pupil standards, particularly oracy and reading. There is a need to critically analyse this position to be able to target specific areas for professional development.

Alexander (2018), summarising and analysing five kinds of talk, stated that discussion and scaffolded dialogue have, by far the greatest potential. However, they also demand most of teachers' skill and subject knowledge. Dialogic teaching challenges not only children's understanding but also that of the teacher. Alexander (2018) develops this theme by making clear that all five kinds of talk, including rote, recitation and expository, can have a place, but it is the teacher who needs to know when and how to use each appropriately.

The overlap between the concepts of dialogic teaching and assessment for learning are closely connected. Therefore, in the hands of the expert teacher, dialogic teaching engages the pupils and enhances their learning, whilst also informing the teacher and pupil how learning is progressing and what needs to be done to accelerate and consolidate it.

Professional development and models of cross curricular delivery

The importance of developing all teachers' subject and pedagogical knowledge is crucial to the development of successful cross-curricular teaching. Barnes (2011), when reflecting on seven case studies illustrating successful practice, refers to the importance of thought, planning and secure teacher knowledge. He also confirms that schools, mirroring the three skills from Pollard's (2010) 'C' list, should be collegiate, working with children and the widest community.

Barnes (2011) drawing on personal research with Shirley (Barnes and Shirley, 2007), suggested that subject progression and integrity is best ensured by limiting the subjects involved in cross-curricular work to two or three. Barnes (2011) identified five distinct types of cross-curricular teaching and learning, hierarchical, multi-disciplinary, inter-disciplinary, opportunistic and double focus.

He extended this taxonomy (Barnes, 2015) to include tokenistic' single-transferable subject learning across the curriculum and theme-based. Theme-based is important, since it is suggested that a relevant and authentic theme may be used to generate learning in a wide variety of subjects and far more than the two or three generally recommended in cross curricular work. Barnes (2015), includes the important request that no subject should be included unless it is essential to deepening understanding of the theme, and unless it can be better understood through application to the theme. The word 'authentic' is key within the Donaldson (2015) publication 'Successful Futures' and so may well be a chosen approach within Wales.

Summary of findings and ways forward (recommendations)

This assignment has considered evidence that suggests that excellent teachers not only exist (Wiliam, 2016) but also have the necessary skills to teach an inspirational cross-curricular curriculum (Hattie, 2011) as envisaged by Donaldson (2015).

However, evidence (Haylock and Manning (2014) demonstrates that teacher confidence, in the competence of mathematics, is in serious need of development. Estyn (2018), in a government commissioned enquiry, questions the unfilled gaps in schools plans for the DCF whilst within their annual report (2018a), confirm that pupils' standards and application of ICT are a weakness in 40% of primary schools. Literacy fares better in Estyn's report (2018a), but it is evident from Alexander's (2018) forensic analysis of oracy, that teachers can improve their knowledge with respect to dialogic teaching that can positively impact on all learning.

Reflecting on this summary, with respect to the focus of the three cross-curricular responsibilities, Estyn (2018a) confirmed that nearly a quarter of schools inspected, need to improve the way that they plan for pupils to use literacy, numeracy and ICT skills in their work across the curriculum.

It is suggested, as a main recommendation, that in addition to the improved planning in these schools, there needs to be a national approach to continuous professional development that seeks to develop confidence and subject and pedagogical knowledge in the existing and future teaching workforce. This approach was certainly implied (Welsh Government, 2015) with the stated focus of developing an excellent professional workforce with strong pedagogy.

Such an approach will need to allow teachers to honestly audit their subject and pedagogical skill sets in the three cross-curricular responsibilities, notably digital competence as suggested by Keefe and Steiner (2018), before accessing high quality, relevant training to address areas for perceived personal development. It is interesting to note that within my own undergraduate study there have been audits in both literacy and numeracy but not in ICT. I see my own personal, professional target as commensurate with this national aim. I would like to be able to constantly and continually access relevant continuous professional development, tailored to my own stage of competence and professional need with respect to each of the three cross-curricular responsibilities.

Kirkwood et al (2000) reflected on two important aspects of developing ICT, one being professional development of teacher skills and the other being the availability of relevant equipment. This assignment concludes with the view that providing this exciting opportunity to develop education of the pupils of Wales (Donaldson, 2015), needs to be accompanied by a strategic and fully funded approach to continuing professional development of teachers alongside the development of well-equipped schools. This cannot be another single one-off initiative. There must be a commitment to continually develop a teaching profession, that becomes and remains, confident enough to ensure that every school is excellent and in which exciting, relevant cross-curricular authentic learning takes place every day.

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