

Looking forward: A critical analysis of literacy, numeracy and digital competence as cross-curricular responsibilities in the evolving curriculum in Wales. (2500 Words)

Introduction

Currently in Wales, the subjects of English and Mathematics, alongside Science and first language Welsh, are referred to as “core subjects” (StatsWales, 2018a). All other subject disciplines, including Information and Communication Technology (ICT), are regarded as the “foundation” or “non-core subjects” (StatsWales, 2018b; Barnes, 2015: p.53). This has been the case since the introduction of the National Curriculum in 1988, where concerns over the balance and breadth of education being received by children beyond “English and Mathematics” were raised (Grigg, 2016: p.155). Whilst Rose’s subsequent review of the curriculum in 2009 still placed a substantial importance on “direct subject teaching,” the need for a more cross-curricular approach to the teaching and learning of essential skills in literacy, numeracy, digital competence and the whole curriculum was highlighted (Rose, 2009; cited in Grigg, 2016: p.155). This broke away from the traditional view of teaching, where knowledge was argued to fall into ‘subjects’ naturally and, thus, a cross-curricular approach to teaching was not compatible with the “natural” knowledge grouping approach to teaching and learning (Kerry, 2015: p.5). However, a cross-curricular approach to teaching and learning was not a new theory for education in Wales, as the influential Plowden Report of 1967 suggested that a flexible curriculum that incorporates children’s curiosity and interest should inform practice (Plowden Report, 1967).

Additionally, the Plowden Report identifies and uses the theoretical works of Bruner and Piaget to draw the conclusion that,

“children can only learn efficiently from concrete situations, as lived or described. From these situations, children acquire concepts in every area of the curriculum” (Plowden Report, 1967: p.192).

This constructivist and cross-curricular conclusion towards the teaching of literacy, numeracy, digital competence and the curriculum as a whole will be developed further during the course of the essay, alongside the vital role that teachers have in developing such skills within the children and for their own professional development.

Currently, the statutory guidelines for the teaching of literacy, numeracy and digital competence is found in the following Welsh Government (WG) documentation: Literacy and Numeracy Framework (WG, 2014); Digital Competence Framework (WG, 2016a); English (WG, 2016b) and; Mathematics (WG, 2016c).

It is important to recognise, however, the new curriculum for Wales, as presented by Donaldson in 2015. Donaldson proposes six new “Areas of Learning and Experience (AOLE): Languages, Literacy and Communication, Mathematics and Numeracy; Science and Technology; Health and Well-being; Expressive Arts and; the Humanities” (Donaldson, 2015: p.107). Furthermore, Donaldson suggests that the current curriculum is already “too complicated and restrictive” (Donaldson, 2015: p.107). Therefore, for Kirsty Williams’ goal to ensure pupils possess and use high level digital, literacy and numeracy skills to be achieved, Donaldson proposes a simpler but connected curriculum to be present in Wales (Donaldson, 2015: p.107; WG, 2017a: p.11). This suggests that the AOLEs of the new curriculum for Wales is a cross-curricular led approach to teaching and learning.

What do we mean by the term “cross-curricular?”

The general consensus among researchers is that a cross-curricular approach to teaching and learning is present where skills from a range of disciplines and ‘subjects’ are applied to a single experience or theme (Barnes, 2015; Savage, 2010; Hayes, 2010; Kerry, 2015). Thus, knowledge should no longer be grouped into categories and ‘subjects,’ as children’s learning “spreads across domains,” but should instead be learned through good quality learning experiences that require knowledge in various areas of the curriculum to be transferred and applied to new learning experiences and challenges (Clyde, 1995: p.115; cited by Kerry, 2015: p.3). After all, “learning takes place through a continuous process of interaction between the learner and the environment” (Plowden Report, 1967: para.539; cited by Kerry, 2015: p. 9). This learning through experience argument for a cross-curricular approach is compatible with the theoretical works of Dewey, who proposed an early form of “Experiential Learning” theory that details how children learn through engagement and interaction with quality and connected real-life learning experiences (Dewey, 1938; cited by Pound, 2006: p.21). This constructivist theory on learning has gained the support of various researchers and, thus, a cross-curricular approach to the teaching of literacy, numeracy and digital competence can be said to be a beneficial way of developing these skills within

children through effective learning experiences (Plowden Report, 1967; Rose, 2009, cited by Griggs, 2016; Barnes, 2015; Hayes, 2010).

Child-led learning and pupil motivation to learn

Savage presents one of the very purposes of a cross-curricular approach to education being to “motivate and encourage pupils’ learning...in conjunction with their wider life experiences” (Savage, 2010). However, it was not uncommon on PTE to hear comments from children such as: “I’m not very good on the computer;” “I hate maths;” and “I find English boring.” When such comments were encountered, it was a great challenge for me to engage children in their learning.

My experience of PTE reflects the findings of several pieces of research relating to why children develop such negative mindsets towards learning and, consequently, become demotivated to learn ‘subjects’. Such research argues that, whilst there are numerous reasons why children can become demotivated and disengaged in their learning in certain ‘subjects’ and across the whole curriculum, the learning environment and the attitudes of those individuals who the child is surrounded by significantly impacts upon the child’s own attitude’s and mindset towards learning (Plowden Report, 1967; Bronfenbrenner, 1979; Liu and Zhang, 2018).

Moreover, children who adopt the mindset that they cannot learn in certain ‘subjects,’ nor learn across the curriculum, would be identified by Dweck as having a “fixed mindset” (Dweck, 2009: p.8-9). Dweck proposes that children with a “fixed mindset” believe that intelligence is capped; Once they reach this cap, they cannot learn any more about the ‘subject’ (Dweck, 2009: p.8-9; Dweck, 2014). Consequently, these children often avoid challenges and problems and fail to fully engage with and explore learning experiences to develop further knowledge and skills (Dweck, 2009: p.8-9; Dweck, 2014). Dweck further suggests that learners with a “growth mindset” acknowledge that their intelligence and skills can be developed and, thus, when a challenge or a problem is encountered, they are able to develop strategies to solve the problem and, thus, develop their skills and resilience (Dweck, 2009: p.8-9; Dweck, 2014). This is clearly a desirable outcome of the new curriculum (Donaldson, 2015: p.42). Furthermore, Estyn identify Pembroke Dock Community School as a school where a “growth mindset” is fostered within the children and this allows children to become independent, resilient learners who can develop and apply skills in literacy,

mathematics and digital competence across the curriculum (Estyn, 2016). This is considered to be good practice (Estyn, 2016).

This resilience to challenges gained through the adoption of a “growth mindset” can lead children to a state of “flow.” Here, learning no longer becomes centred around ‘subjects’ but is instead focussed on the experience that the child is immersed within. “Flow” theory offers the opinion that, where a high level of challenge and a high level of skill meet in an experience, optimal learning occurs (Csikszentmihalyi, 1990; cited by Whalen, 1999). This is similar to Vygotsky’s Zone of Proximal Development theory for optimal learning to occur when the challenge encountered is beyond the current skill level of the learner, but is not so far out of their skill set that no learning would be able to occur, even with guidance from a more experienced other (Vygotsky, 1978; cited by Pound, 2006: p.40). Figure 1 details Csikszentmihalyi’s flow model. Interestingly, however, whilst a “growth mindset” can be adopted in learners with the support of a teacher, children themselves must be involved in the development of this mindset and children can reach a state of “flow” through learning experiences that are “child-led” (Dweck, 2009; Csikszentmihalyi, 1990; cited by Whalen, 1999). Vygotsky, however, places a stronger emphasis on the teacher, as being a crucial figure in the further development of a child’s skills in literacy, numeracy and digital competence, among other ‘subjects’ and disciplines (Vygotsky, 1978; cited by Pound, 2006).

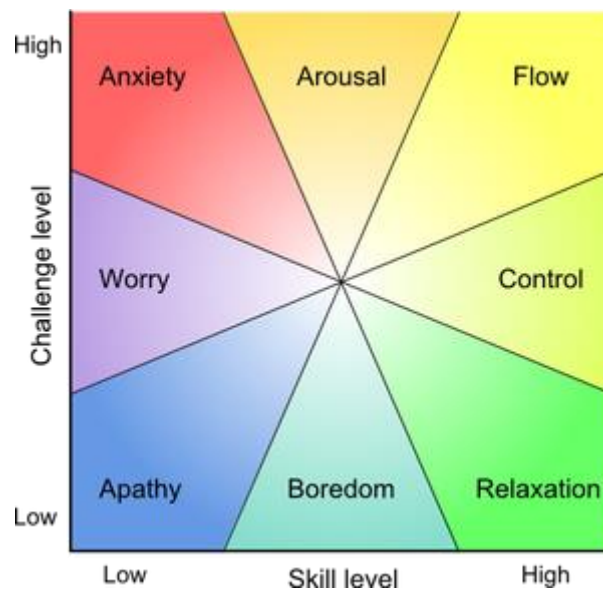


Figure 1. Available at: <https://aupindia.org/2009/12/29/mihaly-csikszentmihalyi-flow/>

Flow theory is compatible with a child-led approach to learning and, indeed, Csikszentmihalyi recognises the benefits of letting children choose what they wish to learn

(Csikszentmihalyi, 1990; cited by Whalen, 1999). Further, he discusses how child-led learning experiences can lead to “intrinsic motivation” to learn and, thus, the occurrence of “flow” can be experienced by these intrinsically motivated children (Whalen, 1999).

Conversely, Barnes points out how motivation to learn is not sufficient in its own right in order for successful ‘subject’ knowledge to develop (Barnes, 2015: p.64). The teacher’s role is crucial to the development of children’s literacy, numeracy and digital competence skills through their discussions with, and guidance of, the children (Barnes, 2015). Vygotsky’s work supports this argument made by Barnes (Vygotsky, 1978; cited by Pound, 2006).

Teacher Subject Knowledge and their role in children’s learning

However, negative mindsets towards ‘subjects’ or ‘learning,’ as witnessed on my PTE, are not exclusive to children. Worryingly, the views and attitudes held towards mathematics by some children, evidenced by the “I hate maths” comments encountered on PTE, has become a widely acceptable viewpoint by society (National Numeracy, 2017: p.14). Deep rooted negative attitudes towards mathematics still requires a substantial degree of input to influence a change (National Numeracy, 2017: p.14; Williams and Easingwood, 2004). Where some teachers and role models hold negative views towards certain subjects and areas of the curriculum, such as mathematics, digital competence and literacy, the attitudes of the child can be adversely affected (Plowden Report, 1967; Bronfenbrenner, 1979; National Numeracy, 2018). This evidences the importance that those individuals in the child’s “microsystem,” that includes teachers and parents, have in enabling a child to become motivated to learn for themselves (Bronfenbrenner, 1979: p.22).

Perhaps a cause of the negative mindsets possessed by some teachers towards particular ‘subjects’ stems from the teachers own concern regarding their subject knowledge. “Mathematics anxiety” can arise from a perceived weak mathematical background in teachers and, consequently, teachers do not feel confident teaching mathematics (Tatar, Zengin and Kagizmanli, 2015: p.68). Such attitudes then become problematic in the classroom as children can acknowledge the beliefs held by the teacher and adopt them themselves (Bronfenbrenner, 1979). However, teacher subject knowledge extends beyond mathematics to include teaching across the whole curriculum, with many researchers highlighting the vital importance that teacher subject knowledge has in order for children to learn effectively from their learning experiences in school (Metcalf et al, 2013; Grigg, 2016; Williams and Easingwood, 2004; Furlong, 2015; Savage, 2010; Barnes, 2015). Furlong even states that

teachers not only need to be “experts at teaching something,” such as literacy, mathematics and digital competence, but “they will also need to be experts in teaching their students to ‘learn how to learn’” (Furlong, 2015: p.5). Arguably, it is possible for this to be achieved through a combination of a “growth mindset” approach to learning and an enquiry-based learning (EBL), or problem-based learning (PBL), approach (Dweck, 2009; Kaldi, Filippatou and Govaris, 2011).

This is a process facilitated by the teacher where children ask a range of questions about a problem or a theme, before being guided by the teacher to investigate. Indeed, mathematics learning is as much about identifying problems and raising questions “as much as it is about solving them” (Pound and Lee, 2011: p.25). Hattie further details how problem-solving teaching can enhance a child’s ability to learn skills across the curriculum, attributing an effect size of 0.61 to problem-solving teaching (Hattie, Fisher and Frey, 2017: p.239). Importantly, an effect size greater than 0.4 is in the range of “desired effects” (Hattie, Fisher and Frey, 2017: p.3).

Thus, a wide range of real-life, meaningful learning experiences should be provided to children (Pound and Lee, 2011). This is certainly presented as being the responsibility of the teacher by some; “The teacher's task is to provide an environment and opportunities which are sufficiently challenging for children and yet not so difficult as to be outside their reach.” (Plowden Report, 1967: p.196). Furthermore, others suggest that one of the very purposes of a cross-curricular approach to teaching and learning is to provide children with meaningful, real-life learning experiences that encourages and motivates children to learn about the world around them (Savage, 2010; Hansen and Vaukins, 2012; Barnes, 2015; Hayes, 2010; Hattie, Fisher and Frey, 2017). This shared view upon pupil motivation to learn through a cross-curricular approach exists despite a wide range of different “models” and methodologies being presented by certain researchers, through the exploration of “themes” and problems, or skills in their own right (Hayes, 2010; Barnes, 2015; Grigg, 2016). Indeed, experience forms a significant part of the new curriculum for Wales (Donaldson, 2015; WG, 2017b).

However, Kerry cautions against the overuse of child-led learning experiences across the curriculum for pure enjoyment of learning (Kerry, 2015). Indeed, Kerry recognises the importance of the teacher in guiding the children in their learning through their interests, as opposed to following every interest of the child which may not have its roots in a meaningful learning opportunity (Kerry, 2015). Barnes further acknowledges that educators must be

careful not to sacrifice beneficial learning in favour of simple enjoyment (Barnes, 2015). In fact, Barnes highlights the need to teach “specific skills” in ‘subject’ areas before encouraging their application to cross-curricular contexts and experiences (Barnes, 2015: p.64). This is a view shared with Hayes, as Hayes identifies a need to teach children fundamental skills in key ‘subjects’ before integrating them with other areas of the curriculum (Hayes, 2010). Therefore, children need to understand certain skills before being required to apply them to cross-curricular learning experiences.

Conclusion

Throughout this essay, two main arguments have been presented: the importance of challenging negative or “fixed mindsets” towards learning and develop children’s motivation to learn across the curriculum and; the crucial role that the teacher has when developing children’s literacy, numeracy and digital competence skills (Dweck, 2014; Dewey, 1938; cited by Pound, 2006). Despite the existence of diverse models presented by researchers, all approaches seek to develop pupil motivation to learn and apply new skills in literacy, numeracy and digital competence across different curriculum areas (Savage, 2010; Barnes, 2015; Kerry, 2015). This motivation to learn can be fostered through discussions between the teacher and the children in order to develop a EBL or PBL cross curricular approach, as a “child-led” approach to learning can not only generate motivation and interest to learn across the curriculum, but also can develop a deeper understanding of the topic through “Experiential Learning” (Dewey, 1938; cited by Pound, 2006; Kerry, 2015; Hattie, Fisher and Frey, 2017). However, Kerry cautions against the overuse of “child-led” learning as a real opportunity to develop lifelong skills in literacy, numeracy and digital competence must be present, while Barnes argues that enjoyment of learning must not overcome meaningful learning (Kerry, 2015; Barnes, 2015). Consequently, the teacher is crucial in developing children’s skills in literacy, numeracy and digital competence across the curriculum, despite those that argue that an increase in cross-curricular planning challenges the effectiveness of a cross-curricular approach (Rowley and Cooper, 2009).

Additionally, teachers and others involved in the child’s “microsystem” have the potential to greatly impact upon a child’s attitude and ability to learn (Bronfenbrenner, 1979: p.22; Plowden Report, 1967; Liu and Zhang, 2018). This can be both a positive and a negative factor for educators and so negative mindsets towards certain ‘subjects’ that have become acceptable in society must be addressed (National Numeracy, 2017; Williams and

Easingwood, 2004). Developing a “growth mindset” in educators as well as the children, through praising one’s development in a ‘subject’ and believing that intelligence and skills can be further developed is vital (Dweck, 2009; Dweck, 2014). Therefore, a recommendation for educators would be to develop a “growth mindset” themselves, as well as within their pupils. Adding the simple word “yet” onto the end of the belief that an individual “cannot do something” could transform a “fixed mindset” into a “growth mindset” (Dweck, 2015).

Thus, through Dewey’s emphasis on meaningful learning experiences and Donaldson’s proposed AOLEs, teachers are crucial to motivating and guiding children to learn through their interests (Dewey, 1938; cited by Pound, 2006; Donaldson, 2015). This can be achieved by providing children with real-life, meaningful learning experiences across the curriculum (Plowden Report, 1967; Pound and Lee, 2011). Whilst literacy, numeracy and digital competence skills can certainly be argued to be cross-curricular responsibilities, the value of “direct subject teaching” should not be overlooked, nor abandoned, but should be used in combination with cross-curricular models such as those presented by Barnes or Kerry (Barnes, 2015; Kerry, 2015; Grigg, 2016).

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