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Analysing Mindset Theory and Strategies Supporting the Implementation of Real PE to Develop a Growth Mindset Culture

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ABSTRACT

Growth mindset continues to be a popular topic of conversation in the field of education and Physical Education (PE). However, despite the existence of various schemes for delivering curriculum PE, there are limited studies analysing how they seek to directly develop children's mindsets. This study analyses the process taken for one of these frameworks, Real PE, to be implemented within a school to develop their growth mindset culture, drawing upon the theories of key educational thinkers. The study is based upon the authors' experiences as PE Subject Leader and member of the school Senior Leadership Team (SLT) within a single-form entry primary school in Leicestershire, United Kingdom; testimonials from other schools who utilise Real PE and existing literature on the effectiveness of growth mindset.

Implementing a growth mindset culture is not straightforward; although important, it is not solely about intelligence and praising effort, nor a battle of fixed versus growth mindsets as within PE, mixed mindsets exist, and, the fixed mindset should be legitimised. Therefore, a long-term, rigorous approach to change considering policies, individual beliefs, training needs, strategies and feedback methods needs to be developed. This study adds to the growing conversation about growth mindset and seeks to support other school settings considering embedding mindset culture within their school setting and PE provision.

KEYWORDS:

physical education, growth mindset, development

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Introduction

Psychologist Carol Dweck introduced Mindset Theory (MT) stating individuals hold growth or fixed mindsets regarding intelligence and motivation. Today, growth mindset, the notion of how people respond positively to failure and its impact, continues as a popular topic of educational discussion (Akin & Radford, 2018).

Over recent years, the importance of growth mindsets and positive outlooks towards PE has increased for several reasons. Firstly, one-third of children aged 2 to 15 in the UK are classified as obese (Public Health England, 2017); secondly, the government highlighted throughout Covid-19 how physical activity supports children's mental wellbeing impacting mood, sleep and anxiety (Public Health England, 2020) and furthermore, schools are held to account for developing pupils' personal skills, referenced in the Primary PE National Curriculum (2013) – 'Pupils need opportunities to compete in sport, build character and embed values' – and the Ofsted Inspection Criteria (2021) – 'Inspectors will make judgements on personal development by evaluating whether the curriculum supports learners to develop their character.' Real PE supports schools in addressing these factors, promoting positivity within PE.

The Real PE framework supports Early Years and Foundation Stage (EYFS) to Year 6, transforming PE for children by providing child-centered lessons, developing key abilities including physical literacy and the emotional and thinking skills required in sport (Create Development, 2017a). Before its implementation within the Leicestershire school, a negative PE culture existed from teachers, who lacked confidence and wanted a PE scheme to enhance delivery, and pupils, who displayed low levels of motivation and resilience, often trying to miss lessons by forgetting kit, feigning injury or not participating. Using Real PE, the school hoped to achieve more confident staff and develop healthier pupils motivated to be physically active whilst developing mindsets so they could support themselves through challenges.

Other approaches for delivering curriculum PE exist including PE Pro, Complete PE and Primary PE Passport, but Real PE was chosen because its six progressive units (Cogs) – Creative, Cognitive, Health and Fitness, Physical, Social and Personal – develop characteristics of learning, cultures of high expectation and establish growth mindset amongst pupils. Data highlights 50% of pupils surveyed before using Real PE felt successful in PE whereas 78% felt successful afterwards (Create Development, 2017b). Particularly, the Social and Personal Cog objectives (Figure 1) support developing growth mindset values, promoting resilience, positivity, motivation and social collaboration.

This paper demonstrates that growth mindsets are important in PE, supporting children to become physically confident in building fitness, character and values. Moreover, it shows long-term planning is essential to successfully implement growth mindset cultures within schools and PE, requiring commitment from SLT, teaching staff

and pupils to overcome barriers. Finally, the paper analyses how Real PE supports recommended strategies that develop growth mindset cultures in PE using its Personal and Social Cogs, and encouraging reflection using assessment.

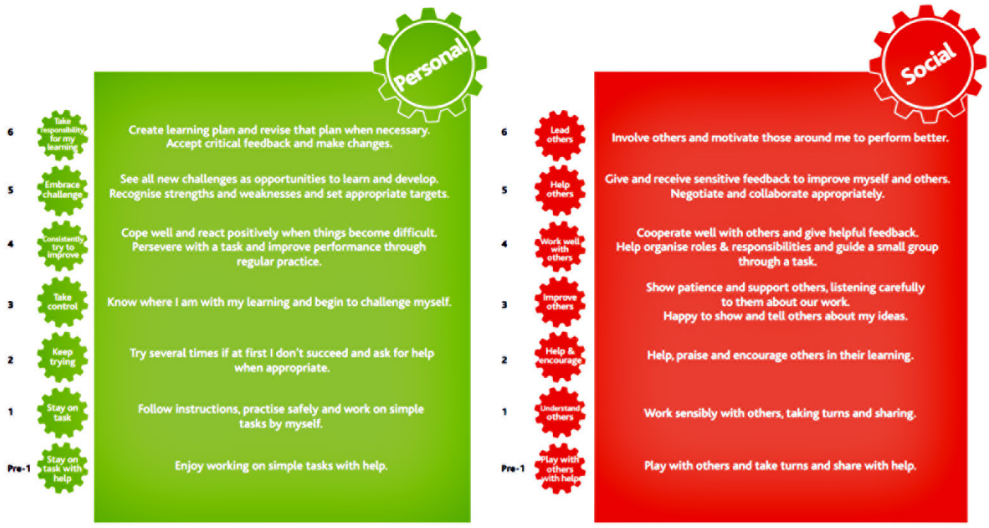


Figure 1. Personal and Social 'Cog' Objectives (Create Development, 2017a)

To demonstrate this, firstly, an overview of MT will be given followed by an outline of educational and psychological theories influencing Dweck's MT. After, growth mindset specifically within PE will be explored in greater detail. Then, the paper will analyse how a growth mindset culture was implemented within a specific Leicestershire school setting before focusing on how Real PE was introduced to support strategies for developing growth mindset cultures in PE. Finally, the key discussion points will be summarised.

Mindset Theory: Overview

Dweck & Diener (1978) observed that children reacted differently to challenges with some giving up whilst others thrived; they wanted to understand how children coped with failures to achieve potential. Dweck's MT further stemmed from failures of the 1980s American self-esteem movement which aimed to motivate children by praising effort but instead, sheltered them from criticism reducing levels of resilience and increasing their need for validation (Dweck, 2014; Sanchez, 2017).

Responding, Mueller & Dweck (1998) conducted studies on the effects of praise highlighting how after success, praise for intelligence was likely to encourage helpless reactions when faced with failure whereas those praised for effort took more risks, understanding positive outcomes were possible. These studies supported Dweck's belief that intelligence is not fixed, the brain is malleable, capable of change through hard work and effort, influencing pupil success by developing motivation, achievement and self-esteem (Dweck, 1999, 2006; Blackwell et al., 2007).

Dweck developed her MT to include growth and fixed mindsets; both help children understand themselves, creating paths for learning (Plaks et al., 2009). Growth mindset (*incremental theory*) is when a child sees ability as flexible, something developed through hard work and instruction from others to maximise potential (Dweck & Leggett, 1988; Dweck, 1999; Boylan et al., 2018). Contrastingly, fixed mindset (*entity theory*) asserts human attributes, including intelligence or personality, are static and cannot be developed, with individuals stressing on performance, less likely to exert effort being helpless in failure (Dweck, 1999; Yeager & Dweck, 2012; Hochanadel & Finamore, 2015; Haimovitz & Dweck, 2017). Dweck suggests when children believe failure is not a barometer of innate characteristics, instead a step toward success (a growth mindset), they can fulfil potential (Hains, 2019).

Dweck emphasises the importance of 'the power of 'yet,' suggesting subtle language alterations from *'I can't'* to *'I can't… yet*,' removes children from the tyranny of now, where they cannot cope with failure, to a longer learning journey where consistent inspirational language develops neurological connections creating more positive attitudes (Dweck, 2014). This approach improved performance in less affluent American suburbs (Dweck, 2014) and Bates (2016), outlined how language changes influenced the determination and results of her pupils.

However, the impact of MT is debated. Supporting MT, Claro et al. (2016) surveyed 10th grade students in Chile which showed holding a growth mindset predicted academic achievement at every socioeconomic level; West (2016) collected data from middle schoolers finding students' mindsets were good predictors of test scores and Bostwick (2018) concluded pupils with growth mindsets significantly outperform fixed mindset counterparts. Aronson et al. (2002) and Blackwell et al. (2007) also discovered inducing growth mindsets enhances personal and academic outcomes.

Yet, recent studies question MT's impact. Bahnik (2017) used aptitude tests with university applicants in the Czech Republic to explore relationships between mindset and achievement finding a negative correlation between the two – Li (2007) drew similar conclusions finding no support for MT's effects on ability or response to challenge. Chao et al. (2017) explored the effects of implementing growth mindsets among third graders with low socioeconomic status in India finding mindset interventions do not affect performance and motivation of lowest or highest performing pupils. Further-

more, Sisk et al. (2018) surmised for typical students in the USA, growth mindset interventions had little or no effect on outcomes – studies by Gorard (2012) and Wilkinson (2015) concur.

MT is not 'resting on a handful of isolated studies' (Dweck, 2017) as research has been conducted across diverse age groups, contexts and environments with varying results, positive and negative. Research suggests just instilling a growth mindset among pupils does not improve performance and motivation as other additional factors are needed (Markman, 2017) including planning, beliefs and time. However, Dweck (2015) responds to criticisms claiming teachers made MT sound too easy when using praise alone – noting hard work, broad learning strategies and powerful relationships are also necessary. Gladwell (2008) supports this noting becoming an expert in skills or characteristics requires 10,000 hours of practice, citing Anders Ericsson's 10,000 Hour Rule (1993). MT's application across schools, businesses and recreation, means Dweck (1999) welcomes further research into its impact on children to evolve the theory.

Growth Mindset: Theoretical Perspectives

Educational thinkers, scientists and psychologists have shaped Dweck's MT. Their influence, including views on intelligence, importance of social environments and development of emotional and personal characteristics, will now be explored linking to growth mindset.

Intelligence

The view intelligence is malleable has not always existed. Scientist Francis Galton (1875) first coined the 'nature versus nurture' debate regarding whether intelligence is inherited or pliable. Galton (1907) claimed intelligence is inherited and children could be channelled into their niche in society through identifying talents. This view was still maintained by Dominic Cummings (2013), then Special Advisor to the United Kingdom Education Secretary, who claimed 70% of children's academic performance is genetically derived, implying children's intellect is pre-determined, promoting fixed mindsets.

Yet many refute this, endorsing nurture, which influences growth mindset. Educational thinker, John Locke (1698), promoted *Tabula Rasa* – how at birth, children's minds are blank slates, void of characters, with education and experiences shaping intellect through 'trying all things' as well as developing an individuals' moral and social codes (Androne, 2014; Bennett, 2017) – imperative in adopting growth mindsets. Philosopher John Dewey (1916), echoed Locke, noting children have ability to develop because the 'self is not 'ready-made' but in continuous formation through choice,' implying

environments, learning by doing and making mistakes shape intellect (Bynum, 2015). Constructivist Jean Piaget (1936), studying cognitive development of children, agreed, noting children construct their own intellect through active, play-led learning, making mistakes and trying again.

Psychologist Albert Bandura's Social Cognitive Theory (1986) bridged Galton and Dweck's views concerning intelligence. Bandura (1995) claimed children have different abilities with everyone possessing growth potential, just from different inherited starting points, considering self-efficacy, motivation and, like others, how reacting to failures positively impacted intellect and learning. Sauce & Matzel (2018) agree with Bandura stating intelligence creates a paradox combining views of nature and nurture because the brain's malleability exists on top of heritability.

Dweck welcomed the 'nature vs nurture' debate recognising the importance of genetics and pliability of intelligence – with growth mindset emphasising developing intellect through effort (Dweck, 2015). Nature should not be completely disregarded as children are born with levels of natural ability. However, creating learning environments with opportunities to explore new experiences and learn from making mistakes develops emotional appetite – allowing children to make the most of inherited ability (Hildrew, 2018).

Social Environments

Social constructivist, Lev Vygotsky (1930) also influenced Dweck, emphasising the role environments have on learning – as Locke and Dewey had. Vygotsky's Zone of Proximal Development (ZPD), compared what learners could achieve through positive interactions and encouragement with teachers and peers opposed to be being unsupported. This, Vygotsky believed, develops intelligence, mental function and support children reaching potential. Today, ZPD is synonymous with scaffolding learning and quality first teaching, which support developing growth mindsets, as children see future learning steps recognising what is possible with effort. Vygotsky (1934) suggested teaching and learning within the ZPD generates best results for children; many agree, advocating ZPD is where growth mindsets flourish through social approaches including coaching, honest feedback and seeking input from others when stuck (Campbell et al., 2000; Dweck, 2015; Rice University, 2015; Seaton, 2018).

Psychologist Urie Bronfenbrenner's Ecological Systems Theory (1974) resembles Vygotsky's beliefs regarding environments impacting children. Bronfenbrenner (1979) considered social systems influencing children, concluding the Microsystem, encompassing relationships with family, peers and school, is the most significant positive factor on children's outlooks and mindsets. Bugental & Johnston (2000) and Bornstein (2006) agree noting parental beliefs affect psychological health in children influencing their mindsets moving forward.

Others however, including John Bowlby (1958), suggest relationships within the Microsystem work against developing growth mindsets. Bowlby's Child Attachment Theory claims by three-years-old, attachments between parent and child are fixed, leading to potential separation anxiety, at which point only positive interventions with parent and teacher change a child's way of relating (The Child Psychology Service, 2021). Similarly, research links Adverse Childhood Experiences, including abuse, neglect and trauma, to various negative outcomes related to children's health, wellbeing and outlook (Families and Schools Together, 2021).

Therefore, educators play instrumental roles developing mindsets and providing positive early learning experiences for children in primary schools; the start of Secondary education is too late (Jess et al., 2007). Teachers are the decisive element in the classroom possessing power to inspire, humiliate or humour, hurt or heal (Ginott, 1972) with Bergin & Bergin (2009) noting teachers improve outcomes for all children, including those insecure and attached, by 'forming secure relationships and providing nurturing environments, then, children can express themselves, become motivated to build resilience and develop growth mindsets.'

However, educators can only do so much as others in Bronfenbrenner's *Microsystem*, including parents, may negatively influence children with their own experiences, promoting fixed mindsets, meaning educators must work hard building positive characteristics but may battle engrained outlooks.

Emotional and Personal Intelligence

Daniel Goleman (1995) introduced Emotional Intelligence (EI) outlining how self-awareness, self-regulation and motivation are requirements of leading oneself to optimum potential – personally and professionally. Bradberry & Greave (2009) agree stating individuals with high EI cope with failures more successfully. Dweck's MT develops children's emotional and personal characteristics meaning the two theories align, with both requiring hard work, effort and commitment to develop (Goleman, 1995, 1998; Dweck, 1999).

In PE, Anderson & Glover (2017) explain that to develop growth mindsets, EI traits should be explicitly taught through integrated approaches; others agree suggesting growth mindsets support the development of personal and intellectual assets including giving children a good sense of themselves, their situations and appropriate responses to failure (Yates et al., 2004; Jackson & Watkin, 2004; Fletcher & Sarkar, 2016).

EI and MT also link with views of Locke and Dewey who advocated the development of personal traits to help children become good members of society. Locke (1693) and Dewey (1916) claimed education should be child-centered, using play to improve idiosyncrasies, develop character, encouraging children to become posi-

tive role models for other children and adults, emphasising self-governance (Bynum, 2015). This also rests with EI, encompassing concepts Goleman promotes including self-awareness, self-regulation, resilience, empathy and social skill.

Summary

The theories outlined influenced MT and are still prominent today in educational settings in classroom practice – through praising children's effort, scaffolding learning and constructive feedback – and wider school initiatives including shaping policy, improving teaching and learning or implementing cultural changes. The ideas are also evident in elements of Real PE to improve motivation, resiliency and support developing growth mindset cultures.

Growth Mindset in PE

Anderson & Glover (2017) state pupils can reach potential in PE if teachers help them develop growth mindsets. There are numerous examples linking growth mindsets and physical activity – from athlete Roger Bannister breaking the first four-minute mile, to tennis player Roger Federer who, after winning twenty Grand Slams, believes he can still develop showing passion for self-improvement, synonymous with growth mindset (Hudson, 2014). However, Hildrew (2018) urges not fixating on high-profile examples deeming them unrealistic; instead focus on attainable role models. In the Leicestershire school, staff wrote biographies documenting their sporting histories then discussed these in assemblies and lessons highlighting how people pupils knew had encountered failures but responded positively supporting growth mindset development.

Dweck's growth and fixed mindsets apply within PE. Anderson & Glover (2017) suggest pupils with growth mindsets in PE believe the development of skills, physical and mental, are malleable fostering motivation, commitment to goals, persistence and resilience faced with obstacles – personal characteristics promoted by Locke, Dewey and Dweck – they also learn from failure, embracing feedback for success. Whereas pupils with fixed mindsets, see physical ability as static, with limited control over skill development, seeing effort as futile as ability levels are pre-defined, impacting motivation. Ommundsen (2001) and Biddle et al. (2003) argue children hold different views about physical ability impacting their mindset, behaviour and motivation claiming children with growth mindsets report higher levels of enjoyment, self-regulation and ability to master goals compared to children with fixed mindsets who self-handicap, are self-aware of limitations and appear unmotivated. Many pupils struggle with physical activity, developing fixed mindsets – consequently, when reaching levels of

PE they find challenging, they give up, not advancing their skills; encouraging growth mindsets amongst pupils in PE improves performance and motivation.

Warburton & Spray (2016) suggest growth mindsets in PE develop over time by not overpraising, promoting feedback and reflection. Dweck (2015) and Anderson & Glover (2017) agree as reflection helps pupils recognise obstacles are opportunities for learning and growth. Real PE supports reflection by incorporating 'Review Questions' throughout lessons where children consider their learning independently, or with peers, refining their work based on discussion outcomes. Further, Warburton & Spray (2016) suggest acknowledging fixed mindsets is key as self-awareness moves learning and outlook forward – linking with EI. Dweck (2015) agrees stating if children recognise their fixed mindset triggers, they can avoid or regulate their reactions, moving toward growth rather than fixed mindsets.

Spray & Warburton (2003) argue the nature of physical activity influences which mindset a child possesses, stating pupils hold growth mindsets in games-based activities compared to fixed mindsets in gymnastics. Frith & Sykes (2016) acknowledge children can have mixed mindsets across and within different physical activities, citing cricket, where technical and physical attributes of the game are deemed malleable, but psychological and tactical elements are less amenable to change. Subtleties across, and within, physical activities must be considered when delivering curriculum PE as classes have diverse skill ranges. Real PE addresses this offering 'a PE experience for every child' (Create Development, 2017a) ensuring pupils are successful in PE in various ways, not just physically, but mentally, creatively, personally and socially.

Doherty & Brennan (2013) claim PE is a unique subject within the primary curriculum and lives of children for several reasons: it fosters various physical skills, develops self-esteem and is associated with good psychological health (Sallis et al., 1997; Fox, 2000; Hassmen et al., 2000). Furthermore, sport is inherently competitive unlike other subjects – Aggerholm et al. (2018) question the suitability of competition in curriculum PE – and, as discussed, pupils can have mixed mindsets in various disciplines (Frith & Sykes, 2016). Thus, creating growth mindsets in PE is challenging but achievable through hard work, trying new strategies and seeking input from others to enhance enjoyment and promote lifelong physical activity (Penney & Jess, 2004). Real PE inspires this, encouraging pupils to master new skills through hard work and effort, teaching lessons using storytelling to engage pupils and, through its Social Cog, empowering pupils to praise themselves and peers for motivation.

Growth mindsets are important in PE to develop love of physical activity, but it is a complicated mindset to cultivate, requiring time, and even then, children may generate opposing mindsets in different areas, adding to its complexity. Teachers play key roles promoting growth mindsets in PE but to do this effectively, they must understand MT. Wang & Koh (2006) recommend more MT training is completed during Initial

Teacher Training (ITT), yet statistics show 40% of primary teachers receive less than six hours of PE training during ITT already leaving them inadequately prepared (Blair & Capel, 2008; Sloan, 2010; Harris et al., 2012), which questions where this additional training could be included.

Implementing a Growth Mindset Culture in School

The approach the Leicestershire school took to implement a growth mindset culture will now be explored demonstrating how a long-term approach was required, referencing barriers that were encountered and how they were overcome.

A school survey identified how pupils displayed low motivation and resilience levels; to address this, following leadership training, the school embarked on implementing a growth mindset culture. Leading authority on change, John Kotter (1996), states 70% of cultural transformations fail because organisations do not take holistic, long-term approaches. Even Dweck (2010) believed implementing growth mindset cultures in schools was straightforward as educators only had to understand MT then decide how to communicate it – she later admitted she underestimated MT's translation to the classroom (Severs, 2020); others agreed her view was naïve (Van Dam et al., 2008; Hildrew, 2018; Dweck & Yeager, 2019).

The Leicestershire school's SLT recognised potential barriers to change, how to address them and were thorough developing the School Improvement Plan (SIP) ensuring high levels of support and high-quality delivery were offered (Kam et al., 2003). The school used Kotter's 8 Stages of Change Model (1996) to develop their two-year SIP and created policies that reflected commitment to growth and regularly revisited them.

In year one, MT theory was introduced to staff, but teachers and pupils had incompatible beliefs with MT principles displaying fixed mindsets themselves. Many argue it is difficult to change someone's mindset *for* them; they must change it themselves (Bechtel & O'Sullivan, 2006; Beswick, 2006; Hildrew, 2018) and to create lasting change, teachers must be convinced of growth mindsets' effectiveness (Dweck & Leggett, 1988; Gollwitzer & Schaal, 2001; Woodbridge et al. (2014). Teachers possessing growth mindsets can best support pupils to consider their mindsets and develop strategies to support learning (Seaton, 2018). Addressing this, the schools gave teachers dedicated time to research MT, encouraging its introduction within classroom routines.

Additionally, although teachers then understood the importance of growth mindsets, they lacked confidence communicating it effectively (Hildrew, 2018; Boylan et al., 2018) which Gunderson et al. (2013) suggest encourages fixed mindsets to prevail. Yettick et al. (2016) note 98% of teachers believed growth mindset approaches should be

adopted in schools, but only 50% knew effective strategies. Staff at the Leicestershire school researched, developed and tested various growth mindset activities collaboratively during INSET days, staff meetings and peer coached one another so teachers could deliver activities regularly across the year.

Lastly, the school did not want to create 'False Mindsets' where teachers and pupils claimed to possess growth mindsets because it was perceived as 'the right mindset' when their actions, words and behaviours did not reflect it (Dweck, 2006). Schools' early attempts implementing growth mindsets see educators not teaching the concept, instead using lessons where two mindsets were defined, charts, posters and buzz words such as 'yet' and then expected pupils to act accordingly (Dweck & Yeager, 2019; Severs, 2000). To prevent 'False Mindsets,' it is not about teaching the concept alone but implementing good practice and legitimising fixed mindsets (Dweck, 2015), so a sustained approach for delivering growth mindset was planned – long term input rather than isolated interventions. Yeager & Walton (2011) argue teaching growth mindset using interventions has detrimental effects on pupils as making them feel they require help through intervention can undo effects of the message.

Addressing these barriers meant when Real PE was launched, staff and pupils understood growth mindset benefits and were ready to embrace its broader implementation.

Implementing a Growth Mindset Culture: Real PE

Real PE was implemented to develop teachers' confidence delivering PE and improve pupils' motivation, resilience and attitudes. This section outlines the support staff within the Leicestershire school received and explores how Real PE satisfies recommended strategies for implementing growth mindset principles within PE considering its Personal and Social Cogs and assessment.

Rhew et al. (2018) suggest schools should emphasise curriculums that integrate growth mindsets focusing on persevering, feedback, and the flexibility of intelligence. Teachers using Real PE praise how it develops the character of pupils claiming in addition to physical gains, the non-physical focuses help the holistic development of pupils across wider school life; encouraging self-awareness and emotional regulation (Create Development, 2017b).

Limited training means teachers aren't confident delivering PE, so their professional learning is essential when leading changes in practice and attitudes (Kennedy, 2005; Pedder, 2006). To implement a growth mindset culture within PE, training was required for staff supporting PE delivery. Staff needed to model desirable personal skills through positive actions and behaviours, showing pupils how to conduct them-

selves within PE, school and wider society – promoting growth rather than fixed mindsets, giving pupils greater autonomy. Staff received Real PE training from Create Development, team teaching with the PE Subject Leader and monitoring of sessions with feedback and coaching – which all increase confidence and self-esteem for teachers (Keay & Spence, 2012; Chambers et al., 2014). Staff and pupils became confident using Real PE, developing positive outlooks; teachers state Real PE helped raise their confidence levels significantly (Create Development, 2017b).

Brady & Alleyne (2017, p. 110) recommend strategies for promoting growth mindsets in sport and PE and these are used as the focus of analysing Real PE's effectiveness in character and mindset development. Two strategies Brady & Alleyne promote reference developing self-awareness of mindsets through providing information about MT, brain plasticity and how to adapt to failures, as these lead to pupils being able to recognise their own mindsets. These recommendations were addressed within year one of the school SIP, meaning pupils and teachers understood MT principles.

Personal Cog

Brady & Alleyne (2017) propose pupils need to recognise the existence of entity and incremental beliefs regarding different aspects of PE including physical, technical and tactical. Pupils with low resilience display fixed mindsets in adversity, when not winning the match or making tactical decisions, yet the Personal Cog uses positive language, encouraging children to persevere and reduce helplessness by trying again when having made a mistake or losing.

Language in the Personal Cog objectives inspires individual growth – '*try several times if at first I don't succeed;*' a desire to improve – '*cope well and react positively when things become difficult*' and increases autonomy with pupils' taking responsibility of learning – '*accept critical feedback and make changes*.' This helps pupils recognise beliefs of growth and fixed mindsets, understanding they could have mixtures of mindsets within different types of physical activity (Frith & Sykes, 2016). The significance of language in developing personal skills, including resiliency and perseverance, links Real PE with the views of Dweck (2014), where she emphasises 'the power of yet' and language in developing skills by strengthening schema in the brain.

Moreover, Brady & Alleyne (2017) advocate identifying appropriate activities to promote positive emotions. The Personal Cog inspires positivity, encouraging children to stay on task, keep trying, take control and embrace challenge. These ideas are supported in EYFS and Key Stage One Real PE sessions, using fun, context appropriate tasks including 'Pop Up Pirates' integrated into stories including 'Pirate Pranks' (Figure 2). Anderson & Glover (2017) and Rhew et al. (2018) would endorse this integrated approach as it develops growth mindset and EI traits.



Figure 2. Real PE story Pirate Pranks (Create Development, 2017a)

When children begin school, their view of PE is potentially 'blank,' which Locke's *Tabula Rasa* endorses, whereas Bronfenbrenner would argue relationships within the *Microsystem* may have already impacted outlooks. Therefore, early positive experiences in PE are essential, developing intellectual enthusiasm and growth mindsets, which Real PE supports via its storytelling approach, cartoon-based characters and encouragement of praise and discussion with peers.

Social Cog

Brady & Alleyne (2017) suggest pupils' acknowledging and praising efforts of themselves and others promotes growth mindsets. Smith et al. (2018) agree noting when teachers and pupils use growth mindset praise, pupils' beliefs about abilities are positively impacted.

The Social Cog objectives promote praise by encouraging pupils to use positive language, patience and cooperation to motivate others to perform better and persevere. Teachers can prevent failures using 'process praise' to create hardy and resilient children who respond positively to failure (Dweck, 2014). Studies show, when facing failure, children cope by finding worse performing students or running from difficulties completely (Mueller & Dweck, 1998; Blackwell et al., 2007; Nussbaum & Dweck, 2008) – fixed mindset behaviours. Like Dweck, Real PE emphasises praise and how it helps pupils develop growth mindsets when linked to learning outcomes; teachers state constant praise of behaviours over time meant pupils had positive PE experiences showing desire to do well (Create Development, 2017b).

Within lessons, children select their level of challenge – scaffolded from yellow (easiest) to black (trickiest) – and modelled by primary school children promoting attainable outcomes (Figure 3). Real PE advises mastering skills before progressing to the next, yet many of the skills are challenging, therefore, within skill development elements of lessons, children praising one another is powerful in developing perseverance, positive attitudes and growth mindsets.

Additionally, the Social Cog encourages pupils to share ideas, learn from others and seek social support – another of Brady & Alleyne's strategies. The objectives ask

pupils to work well with others through *'giving and receiving helpful and sensitive feedback' and by 'negotiating and collaborating with others.'* Vygotsky (1934) underlined the importance of strong social environments and interactions and relationships within them. Real PE promotes social interactions using techniques including open feedback and seeking input when stuck. Allowing children to build positive relationships with teachers and peers in PE, through praise and feedback, gives them autonomy to lead themselves and develop positive attitudes to PE together. Bronfenbrenner (1974) suggests feedback helps pupils express themselves freely and build strong relationships with peers – this would reinforce positive PE experiences.

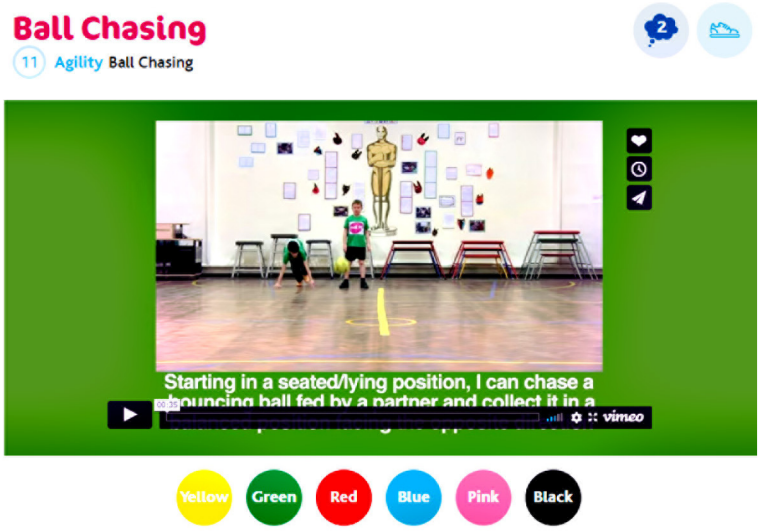


Figure 3. Real PE skills and levels of challenge (Create Development, 2017a)

Assessment

Brady & Alleyne (2017) recommend opportunities for reflecting on experiences and times pupils have overcome difficulties in PE. Real PE achieves this by embedding 'Review Questions' throughout sessions encouraging reflection on specific lesson elements – these can be posed by teachers but work best when children do this in pairs or small groups, developing leadership and critical thinking skills. The review questions link to session skills – '*why do we bend our knees when we land?*' or Cog objectives such as '*why is it important to take turns going in and out of the rocket?*' (Social) or '*why is it important to keep going even when we find things hard?*' (Personal).

Furthermore, Real PE sessions end with a 'Review Method' (Figure 4) as assessment, further encouraging pupil reflection.

Review methods use self and peer assessment to consider how improvements can be made or offering praise, giving reasons why. Real PE uses several methods to encourage reflection including games, such as 'Time Shares' or 'Taps for Congrats,' discussions or secret ballots where pupils vote on how they believed they performed in lessons.

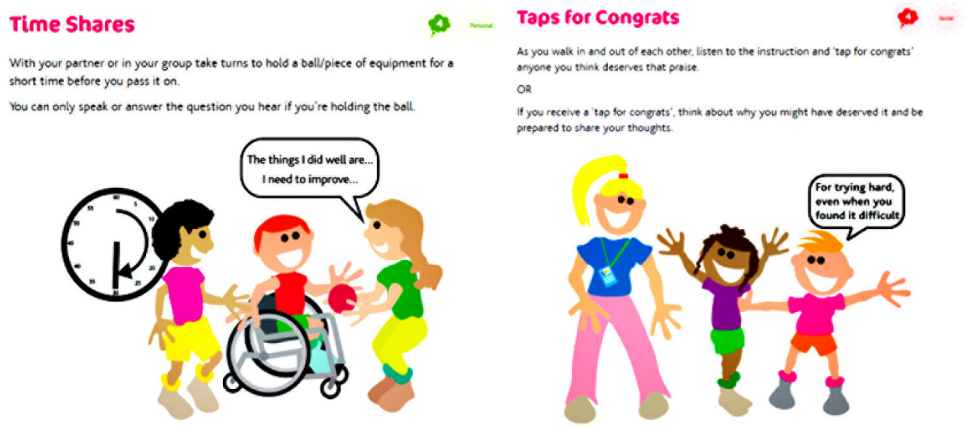


Figure 4. Examples of Review Methods (Create Development, 2017a)

Reflecting in Real PE sessions and embracing feedback develops deeper critical thinking, self-awareness of performance and how to improve, increasing motivation, resilience and growth mindsets.

Summary

Real PE supports developing a growth mindset culture through its Personal and Social Cogs objectives and assessment methods. Cogs, taught in six-week units, across every year group from EYFS to Year 6, are integrated into other sessions meaning resilience, perseverance, motivation, praise and teamwork are regularly revisited linking with Cognitive Load Theory, developing stronger neurological connections and facilitating a positive PE culture.

Study Limitations

This paper demonstrates how Real PE supports implementing growth mindset cultures in PE, however, limitations exist regarding the evidence used, accuracy of assessment and effectiveness of MT, which must be noted. Throughout, views are taken from three

main sources: Create Development's website and a Real PE impact report – both used for marketing to sell the framework meaning bias exists, and using the experiences of a PE Subject Leader and member of SLT implementing Real PE within one school. More studies of Real PE and its impact on mindset need to be conducted for greater reliability.

Additionally, within Real PE, teacher assessment must occur to judge effectiveness of skill and character development. Real PE provides an assessment tool, but it is time consuming and difficult to assess entire classes, so, despite training, do teachers have knowledge and confidence to complete this accurately, are pupils truly developing mindsets or does assessment become a tick box exercise?

Furthermore, as demonstrated, MT has not been proven to make appreciable differences in student's academic or personal achievement and assumes growth mindset is applicable to all children. Research shows this is not the case irrespective of age or context (Wilkinson, 2015; Bahnik, 2017; Chao et al., 2017; Sisk et al., 2018). Growth mindset cannot be forced as it could make children feel disrespected and disparaged reinforcing helplessness instead of helping (Singer, 2019) and, because Real PE requires skill mastery before progressing to the next skill, it creates a fine line in mindset terms – pupils already possessing fixed mindsets could become demotivated further if they continuously repeat the same skill over again until it's perfected.

Conclusion

Dweck's MT is complex. As demonstrated, it has been influenced by several theorists and educational thinkers over recent centuries. Consequently, growth mindset, and implementing it as a culture, is not just about intelligence and praising effort, it needs everything else around it (Severs, 2020) – policy, training, long-term planning, compatible beliefs, resources and time for teachers and pupils to strengthen understanding of growth mindsets to develop motivation, resilience, learning strategies and how to cope and respond to failure. Dweck (2015) did not realise the range of obstacles herself.

This paper highlights the importance of fixed, growth and mixed mindsets in PE success and that pupil's ability in PE is malleable. It also shows to implement a growth mindset culture in PE, a long-term approach is required alongside a collaborative understanding of theory and its application across staff to build confidence. Real PE can be considered an effective framework for embedding a growth mindset culture in PE using fun, engaging methods for pupils across the primary phase, yet it is only one possible approach to develop ability, character and mindset in curriculum PE – more case studies must be conducted to analyse its full impact.

A major concern regarding growth mindsets is that teachers oversimplify it and not given time to understand its nuances for effective implementation. Dweck is her theories biggest critic (Severs, 2020) and, as MT evolves, she welcomes wider research into areas including PE, because she notes, 'growth mindset is on a firm foundation, but we're still building the house' (Dweck, 2017).

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