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CAROL DWECK

MINDSETS AND MOTIVATION

LEARNING OUTCOMES

Having read this chapter you should be able to:

- appreciate Dweck's notions of mindsets and their relationship with motivation for learning
- identify and understand the differences between fixed and growth mindsets, and the connections with their respective entity and incremental theories
- apply the principles of building a growth mindset with students, which involves creating a culture of accepting challenges and the use of appropriate praise
- critically appraise Dweck's concepts.

KEY WORDS

fixed mindsets; growth mindsets; learned helplessness; entity theory; incremental theory; contingent self-worth

INTRODUCTION

Carol Dweck is generally considered a renowned researcher in areas which span the studies of social psychology, developmental psychology and personality. Her work encompasses the psychological tradition that emphasises the power of people's self-beliefs. She posits that whether people are aware of these beliefs or not, they have a profound influence on what people aspire to and whether they succeed in their aspirations. Her work also demonstrates that shifting people's beliefs, even uncomplicated beliefs, can result in deep and meaningful consequences for their personal development (Dweck, 2012). Dweck's research and writing has mainly focused on the role of motivation, self-beliefs and self-theories in people's learning. Broadly speaking, she argues that learners can be classified into two separate groups. First are those who she calls entity theorists, who think that their intelligence is static and regardless of effort and resolve cannot be changed; these are learners who have **fixed mindsets**. Second are those who she calls incremental theorists, who think that their intelligence can, by effort and perseverance, be developed; these are learners who have **growth mindsets**. It should be noted at this early stage that Dweck felt that 'learners may not have fixed mindsets in every context of their lives; they may believe that they can grow in one area of learning but not another' (Robins, 2012: 54).

Dweck contends that the way learners perceive intelligence, as either a static characteristic (fixed mindset) or a flexible and developmental characteristic (growth mindset), can have a profound effect on their motivation and achievement (Dweck, 2009a). Those who possess a fixed mindset tend to be excessively anxious about how clever they are perceived to be. As such, they are inclined to steer clear of challenges and fail to recognise the significance of effort – when confronted by adversity they fail to reach their potential. Conversely, learners who possess a growth mindset are more interested in the process of learning itself instead of trying to give the impression of looking clever. Growth mindset learners openly look for challenges, realise the importance of effort and tend to excel when confronted with complexity (Dweck, 2009a). In an article which explores who will be the successful learners in the future, she states that 'The twenty-first century will belong to the passionate and resilient learners' and urges teachers to 'foster the growth mindset in our students so that they can be among them' (Dweck, 2009b: 9).

Overall then, an important focus of Dweck's interests and subsequent research concerns the concept of self-theories or mindsets. These self-theories are the beliefs that children create for themselves about their personal qualities, including what they feel about their own intelligence. The impact of these self-beliefs on education as a whole is crucial because it can have an influence on how we motivate, teach and assess students as well as how we manage transition periods with learners. According to Dweck, by fostering growth mindsets educators can help learners overcome challenges, avoid the fear of failure and celebrate effort over outcome; this in turn will benefit children across all the stages of their educational development.

Moreover, she argues, perhaps somewhat optimistically, that people who have a growth mindset 'in a particular area of their lives are happier, healthier, more fulfilled and successful in … school, work, sports, business, love, friendships or family relationships' (Dweck, 2006: 20). Before this chapter considers the details of Dweck's theories of motivation and mindsets and application of her work, it is necessary to explore her academic background and writings to appreciate the context of her research findings and theories.

CAROL DWECK, THE PERSON

Carol Dweck is an American psychology professor who has been intrigued by 'outstanding achievement, especially in the face of adversity, and saddened by wasted potential' (Dweck, 2000: ix). For over forty years Dweck has dedicated her research towards a better understanding of motivation and achievement. Her research has been a collegiate endeavour and has included working alongside graduate students and postdoctoral fellows. She was, from an early stage in her research career, 'obsessed with understanding how people cope with failures, and … decided to study it by watching how students grapple with hard problems' (Dweck, 2012: 3). For Dweck, understanding how people coped with failure was of particular importance in a society which was preoccupied with the notion of inherent intelligence and effortless genius (Dweck, 2000). The research undertaken by Dweck and her associates drew on thousands of participants from a range of mainly educational settings, from early years to those attending colleges. Her research also encompasses fields such as sport, healthcare, parenting and business. Participants come from a variety of ethnic groups and span both urban and rural areas of the USA (Dweck, 2000).

She graduated with a Bachelor's degree in psychology from Columbia University in 1967, and a PhD, also in psychology, from Yale University in 1972. She is currently the Virginia and Eaton Professor of Psychology at Stanford University. Before this she was the William B. Ransford Professor of Psychology at Columbia University. Among her many other accolades she has been the elected member of the American Academy of Arts and Sciences, a position she has held since 2002. She portrays herself chiefly as a researcher in social psychology (Pound, 2009; Dweck, 2012, 2017a). Her research has been innovative and has transformed the study of motivation, specifically in such areas as how self-beliefs and goals impact on learning and achievement (Dweck, 2009a). The findings from her research have been documented in her numerous writings in the form of journal articles and books, all of which reflect her long-held enthusiasm for understanding matters of social psychology and in particular topics which come under the umbrella theme of motivation. Her writing, especially the books, offers some helpful advice on how her theories can be applied in classrooms.

Much of her well-regarded early writing was published in peer-reviewed journal articles in the early 1970s and focused around her concept of **learned helplessness**;

these included 'Learned helplessness and reinforcement responsibility in children' (1973) with N. Dickon Reppucci, and 'Role of expectations and attributions in alleviation of learned helplessness' (1975). There are two works which are of particular importance in both explaining her concepts and offering ideas for putting those concepts into practice. The first of these is *Self-Theories: Their role in motivation, personality and development* (2000), a book which is especially useful for those working with young children. It is clearly written and offers numerous examples for practice, in which her main advice is that practitioners can help develop children's learning by nurturing their persistence and positivity (Pound, 2009). This book was also named 'book of the year' by the World Education Fellowship (Dweck, 2012). The second is *Mindset: The new psychology of success* (2006), and this text challenges the conventional way in which praise is used with learners. She contends that praising intelligence and ability could harm self-esteem and achievement; furthermore, it could endanger success. Dweck also promotes the idea that knowing about how the brain works can foster a love of learning and enhance resilience (Pound, 2009). Her writings have also appeared in the broader media such as *Time Magazine*, *The Washington Post*, *The New York Times* and *The Boston Globe* among others (Dweck, 2012). All of these writings were a result of the outcomes from her research, where she explains her concepts.

DWECK'S CONCEPTS

Dweck's concepts have developed from her quest to have a better insight regarding meaningful motivation and how this relates to learner achievement. As we have mentioned, her earlier research concerned learned helplessness, which drew a great deal of interest from educators mainly because of the gender perspective she identified in her work. It is likely that the findings from this early work on learned helplessness acted as a guiding light for her future research. As such, the notion of learned helplessness is briefly explored here as a way of understanding how Dweck's concepts have evolved. She discovered that girls would probably display learned helplessness more than boys. Interestingly though, teachers were apt to blame boys' failure on disinterest or poor behaviour. Conversely, girls' failures were ascribed to an absence of ability. Moreover, girls' successes were thought to be merely a matter of hard work (Pound, 2009). Dweck found that children with learned helplessness (which she considered to be about half of all children) believe that when they fail it is irreversible. Also, when children with learned helplessness encounter failure they usually attribute such failure to being unintelligent and typically become pessimistic and lose their tenacity (Dweck, 2000; Pound, 2009). This early work set in motion Dweck's future research into motivation and achievement and involved a number of interrelated themes, including self-concept, self-esteem, intelligence, contingent worth, self-theories, mastery-orientated learning, praise and the notion of gifted children. Her main concepts of **entity theory** and incremental theories, and the respective fixed and growth mindsets, are interwoven throughout this section.

Dweck discovered that there was a strong link between learners' self-concept and self-esteem and their accomplishment, and this was influenced by how they perceived their abilities and intelligence; either their abilities were a fixed factor, or they could be changed through effort and the use of learning strategies. She argued that learners who saw intelligence as a fixed factor came within the entity theory of intelligence as corroborated by IQ and summative assessment results; these learners felt that their results were finite and there was nothing they could do to improve. On the other hand, those learners who saw their abilities as being flexible and a process of ongoing development came within the **incremental theory** of intelligence; these learners typically welcomed challenge, worked hard and had little fear of failure. Those learners who hold the entity theory see failure in their learning as a personal failure which is irretrievable, which in turn affects their self-concept. Thus they tend to shy away from challenges as they are seen as a threat to their self-esteem. To retain their self-esteem they require easy, risk-free tasks that will allow them to succeed. However, learners who hold the incremental notion of their abilities have little anxiety about failing from a personal point of view. Their self-concept and self-esteem are not affected by challenging themselves in a persistent manner with difficult tasks, regardless of outcome, as they see tasks and assessments as a process of development (Dweck, 2000; Race, 2007).

The findings from Dweck's research with young children indicated that those children who subscribed to the entity theory, or fixed mindset, of intelligence were aligned closely with what she termed **contingent self-worth**. For Dweck contingent self-worth is 'the idea that you are worthy when you are succeeding and unworthy when you are not' (2009a: 312). Although it is understandable for children to be disappointed when they do not achieve as well as they thought they should, some children who hold a fixed mindset, she argued, lose their self-respect and the feeling of being a person in their own right. When this happens children become unable to operate in a meaningful way, and thus 'these children conclude they are bad people when they fail or are criticised, and become too paralysed to fix the problem' (2009a: 312). These findings, particularly with such young learners, are disquieting for the long-term effects on their self-esteem. Dweck offers a more optimistic and progressive viewpoint concerning self-esteem. She considers that the notion of self-esteem should be about what learners experience because they are fully involved in trying to master something new. However, she also warns that this is not something we can just give to learners as a gift, but it is something we can as educators make possible, and when we do 'we can help ensure that challenge and effort are things that enhance self-esteem, not threats to the ego' (Dweck, 2000: 119). What teachers and parents can do is motivate children to develop an incremental or growth mindset position in their learning.

For Dweck, 'motivation is the motor for intelligence' as it helps learners make the most of their intellectual capabilities over a period of time to reach their full potential (Dweck, 2009a: 311). She further argues against the common idea that intelligence is all that is needed to succeed, and cites examples of 'clever' children who achieve very little, contrasting this with other people who did not appear too 'bright' when they

were younger who have made massive contributions to their particular field of study, because they were passionate about their subject. She further questions the importance of spotting and celebrating ability and talent in young children:

> I do sometimes wonder whether what children come with is not talent or ability – but fascination with something. Prodigies, for example are not just little fonts of knowledge and skills, but are riveted by numbers, words, or music. Wouldn't it be interesting if the fascination comes first and the ability comes second? (2009a: 311)

She contends that what educators and parents should be doing when motivating learners is not building up their intellectual self-confidence, but creating a learning culture and a position of confidence which weathers obstacles and celebrates effort and persistence. This, she states, is best done by encouraging students to concentrate on the overall aim of learning, and teaching them the value of hard work and offering suggestions for strategies which the children can use to overcome setbacks (Dweck, 2009a).

According to Dweck, such motivation should be driven by the concept of learners developing an incremental and growth mindset through a mastery-orientated approach to learning. She has contrasted this mastery-orientated approach with learned helplessness (entity and fixed mindset) in the way educators set two different and corresponding goals for their learners. Firstly, she identified a 'performance goal' relating to learners gaining positive feedback about their ability and side-stepping negative judgements; a measurement of their ability from their performance. Hence learners who seek performance goals are anxious about their level of intelligence, they aim to be perceived as being clever and not stupid, and therefore they try not to make mistakes and tackle tasks which they think they can accomplish. The second goal is a 'learning goal', and unlike the performance goal, relates to mastering new tasks and learning new skills. The focus here is on discovering strategies that develop the learning process. With the learning goal it does not matter too much if things go awry in trying to achieve a task; learners do not blame their intelligence, they merely consider that they have not yet found the correct strategy so they keep on looking (Dweck, 2000).

Dweck questions the idea of the use of certain forms of praise to boost learners' confidence and to motivate them to succeed. It might seem reasonable that praise is beneficial for learners if it helps them believe in their capabilities. However, she argues that praising children's intelligence can lead them to fear failure, evade challenges, become uncertain about themselves and manage setbacks badly. As such, they remain subscribed to the entity theory and fixed mindset, and fall short of embracing mastery-orientated learning. As she explains:

> Children love praise. And they especially love to be praised for their intelligence and talent. It really does give them a boost, a special glow – but only for a moment. The minute they hit a snag, their confidence goes out of the window and their motivation hits rock bottom. If success means they are smart, then failure means they're dumb. That's the fixed mindset. (Dweck, 2012: 175)

She does not suggest that educators or parents refrain from praising children altogether, only that they refrain from praise that judges their intelligence, or suggests pride in their intelligence and ability. Dweck promotes praise that enhances the growth mindset. This is praise that celebrates perseverance, effort, study, hard work and the use of learning strategies (Dweck, 2012). She advocates teaching children how the brain functions and how to make it work better to aid their study practices and form their own learning strategies. To help learners find out about the workings of the brain Dweck and her colleagues developed the 'Brainology' interactive computer program which she suggests schools use as part of a study skills curriculum (Dweck, 2007).

One final aspect of her vast work which merits inclusion, particularly as it appears to be a common phenomenon in many schools, is her unease with the term 'gifted children'. She feels that by using the classification 'gifted' there is a likelihood of encouraging a fixed mindset for those children given this label. She justifies this:

> We are, in essence, telling them that they have been given a 'gift', a fixed ability that sets them apart from the others and makes them more special than others. I worry that some children will become so focused on showing they deserve the label that they will stop challenging themselves, avoiding any situation that might reveal an inadequacy and show that they do not have the gift. (Dweck, 2009a: 311)

Furthermore, there is a perception that a gauge of giftedness is the ability to think and learn quickly – if, however, a learner has to work hard, take time to think and learn slowly, they are not gifted. Yet with a growth mindset learning and accomplishment come from a high degree of perseverance and effort over time: 'Instead of being markers for giftedness, speed and perfection are enemies of high-level learning. Real learning comes from a lot of hard work' (Matthews and Folsom, 2009: 22). Dweck does not altogether condemn giftedness as such, but argues that 'such programs should convey loudly and clearly that students' current ability is just a starting point and that challenge, effort, and learning are the only way to fulfill their potential' (Dweck, 2009a: 312). She also warns that in using the labels talented, gifted and brilliant there is a danger that we may 'rob them of their zest for challenge and their recipes for success' (Dweck, 2017b: 74). It ought to be noted here that the definition of the term 'gifted and talented' usually is in two parts: 'gifted' is more attributed to a learner who shines in their academic work, and 'talented' is attributed to practical skill-based subjects. However, what is really important is the word 'potential' – the learner will still need to have access to support and guidance to attain their actual specific gifted and talented potential (Castle and Buckler, 2021).

Dweck's ideas are closely linked with other educational thinkers who have made connections between learning and personal growth, motivation, and those who have argued that intelligence is not a fixed and single entity.

LINKS WITH OTHER THEORISTS

Dweck's concepts have clear connections to the ideas of eminent past and present educational thinkers. Her fixed mindset in particular is closely linked with classical Freudian theory where people strive for pleasure and try and steer clear of pain. They acquire defence mechanisms 'that help them ward off anxiety and channel their impulses into socially approved activities' (Dweck, 2000: 136). However, other theorists such as Abraham Maslow proposed that children strove for growth and personal development as part of their human nature, akin to Dweck's growth mindset. Similarly, Carl Rogers felt people who were fully functional were receptive to change and had faith in their own reasoning without recourse to external consent: 'for Rogers, learning and personal growth were interdependent' (Robins, 2012: 38). Nevertheless, Rogers also contested that such personal growth could be spoiled by unkind, cruel or rejecting behaviour from parents. Such treatment might lead to children feeling embarrassment and guilt, which in turn might prompt them to try and please their parents rather than being concerned with their own personal growth (Dweck, 2000). A.S. Neill also raised his concern at how guilt hindered children's personal development because, similar to Dweck's entity theory, failing to reach what they perceive as the required standards of society would bring censure from adults. Moreover, Neill argued that guilt restricted children's ability to be creative for fear of failure (Neill, 1960).

Dweck's notion of fostering an incremental theory and a growth mindset is also compatible with those of a number of constructivist thinkers. Foremost among these is Piaget, who thought that children should explore and discover during learning and not be anxious about making mistakes, and that the role of the educator is to facilitate the learning process and encourage further study. Piaget thought children were intrinsically motivated to learn and therefore did not need rewards. For him 'praise and reward is at best an irrelevance and at worst an interference in a child's self-determined learning journey' (Robins, 2012: 36). Similarly, Vygotsky believed that learning should be a progressive process and teaching should start with what the learner already knows through challenge and by giving precedence to how children learn rather than the product of the learning. Dweck's notion of encouraging children to adopt learning strategies which challenge their learning process is aligned with Bruner's 'scaffolding' concept, where educators help children reach their full potential rather than being fixed to their current level of ability. Bruner argued that it was the interest in the subject being taught that was the main motivator for children's learning and not the external motivation of test results. Furthermore, he suggested that educators refrain from extrinsic motivation such as giving rewards and praise. Praise and possible punishment were liable to impede children's intuitive and creative thought, which would probably deter them from taking risks because they might make mistakes (Robins, 2012). These ideas on motivation as well as the concepts of scaffolding are also similar to those promoted by Barak Rosenshine and his principles of instruction.

Her concept of self-theories is similar to Albert Bandura's concept of self-efficacy. Bandura contends that people with a positive self-efficacy trust that they themselves can achieve any task that is required with confidence and persistence (growth mindset). Those with negative self-efficacy are unsure of themselves and doubt their ability to achieve; they may avoid tasks altogether or concede defeat when they meet obstacles (fixed mindset) (Wentzel and Brophy, 2014). Like Dweck, Bandura advocates the fostering of 'intrinsic motivation and the resilience needed to buffer the negative effects of academic anxiety' (Mitchell, 2008: 78). Guy Claxton also promotes resilience in the learning process. He posits that the idea of intelligence being a fixed entity is harmful, as children will infer that difficulty is 'a sign of stupidity, feel ashamed, and therefore switch to self-protection by hiding, creating diversions or not trying' (Claxton, 2002: 121). Several recent educational thinkers have, like Dweck, questioned the notion of intelligence being fixed by IQ scores and test results. Two of these theories have been well received by educators: firstly, Howard Gardner's multiple intelligences, and secondly, Daniel Goleman's emotional intelligence. Finally, Dylan Wiliam's work on promoting the use of positive feedback, which suggests strategies for students' future improvement, is very much aligned with Carol Dweck's work. Although Dweck's ideas have many connections with those of other educational thinkers, some of her notions have drawn a degree of criticism.

CRITIQUING DWECK

In reading about Dweck's concepts it seems difficult to be critical of her work, mainly because of the empirical research that has been undertaken. Her ideas also appear to be quite straightforward and she is very optimistic about their practical application. Yet it is the very uncomplicated and optimistic nature of her work, particularly in an increasingly competitive education system which demands and values test and exam scores, which attracts the most censure. Additionally, Theodore (2020) suggested that outcomes of the mindset research seem to be mostly modest, and the statements about the advantages of growth mindsets have been overemphasised. Dweck herself has acknowledged a number of criticisms along these lines and has attempted to answer them, perhaps unconvincingly in some instances. Her concept of failure preceding and guiding the start of a more creative learning process is a worthy idea and certainly within her notion of incremental theory and growth mindset. However, sadly it is probably unrealistic for most schools, who have set time-limited curricula to work through, league tables to compete in and financial constraints, to give children the time to explore and learn inquisitively (Wilson, 2009). Her emphasis on hard work, effort and persistence could for some children, particularly the very young, be quite harmful as it could deny them their childhood (Dweck, 2000). The criticism of hard work being detrimental to some children is also echoed by Theodore (2020), who cautions that there is a possibility that 'the blame for failure ends up being placed

squarely on the student, who is made to believe that he or she did not "try hard enough"'. This is especially the case if work overshadows play. Furthermore, an overemphasis on persistence could also cause children to be anxious and unable to cope with the stress that this effort brings, particularly if it is outside the reach of some children's ability level. Moreover, Dweck's claim that everyone has the potential to change from a fixed to a growth mindset is unrealistic.

Pound (2009) suggests there are two other aspects of her work that could also attract criticism. The first of these is related to the marketing of her interactive computer program Brainology, which is designed to teach children the functions of the brain as part of a study skills course. Dweck's explicit promotion of the Brainology program as a product could perceivably diminish her impartiality as a researcher, and as such her work underpinning Brainology has the potential to lose its standing as a piece of research. The second possible criticism from Pound relates to her view that intelligence is flexible and her opposition to the value placed on IQ scores by education and society as a whole. This, Pound suggests, could draw censure from those who disagree with her views, such as those whose businesses make financial gains from the production and distribution of standard intelligence assessment material (Pound, 2009). The final and more generic points of criticism are associated with her writings. Dweck is somewhat repetitious in reporting the findings of her research and there is at times some duplication between terms such as 'entity theory' and 'fixed mindsets', as well as 'incremental theory' and 'growth mindsets'. Although a minor observation, Dweck uses terminology which is relevant to the USA, such as her use of 'smart' and 'dumb' when describing children's abilities, which is perhaps not apt for other countries which use the English language. Further to this possible disparity between US and UK terms, recent research carried out by Warren et al. (2019) with nine-year-old pupils in the UK suggests that the preponderance of research on mindsets has taken place outside the UK, which calls into question the generalisation of the cross-cultural outcomes of Dweck's research. Although the outcomes from Warren et al.'s research broadly agreed with Dweck's mindset ideas, there was one area that did not appear to correlate. While Dweck (2014) argued that developing growth mindset could improve inequality, particularly for underperforming learners, Warren et al. (2019) found that this was not the case in their research for children with special educational needs or for those children receiving free school meals. Nevertheless, these observations do not lessen the merit that Dweck's work thoroughly deserves. Her research and writings have a profound effect on how educators can endeavour to create a more progressive learning experience for children.

APPLYING DWECK IN THE CLASSROOM

What is evident in Dweck's ideas is that they make sense to educators who can relate to her concepts of mastery-orientated learning and helplessness. Many educators

know children who react differently to challenging situations, and the strategies she offers are straightforward to apply in a classroom situation, which has added to the impact her concepts have had for practitioners (Pound, 2009). This section will consider the different aspects of application in fostering children's growth mindsets. Dweck is confident that teachers can facilitate learners to cultivate a 'growth mindset which leads to not just a short-term achievement but also long-term success' (Dweck, 2010: 16). She argues that this can be done by educators encouraging learners to adopt the incremental theory of ability and a mastery orientation toward their learning endeavours. Broadly speaking this is achieved by educators depicting learning activities 'as opportunities to acquire (not just display) knowledge or skill and give feedback that reinforces this idea. Where relevant, help students to see how an activity fits into a larger strand' (Robins, 2012: 149).

To begin with, Dweck recommends that educators try not to assume that those learners who are 'slow' to understand concepts will never be able to learn competently, or even excel, in the future. Rather, educators should try and discover what these slower learners do not understand and which strategies they do not possess. From that point on educators should help learners formulate learning goals to enable them to achieve by portraying subjects and themes in a growth context and giving learners process feedback (Dweck, 2012). Such process feedback should not mention anything which relates to the learners' abilities. She also advocates keeping away from giving feedback that is general in its nature, instead recommending that educators give specific commentary in response to learners' work. Most importantly she warns against praising learners' abilities or intelligence. She proposes that feedback concentrates on effort, care, a focused approach to the learning process, and developing effective learning strategies (Robins, 2012: Dweck, 2017b). Petty offers some ideas and consequences regarding the application of praise for learners' developing growth mindsets:

> Avoid giving 'personal orientated praise': e.g., 'I'm proud of you'; 'you're good at this'. Because it:
>
> assumes that success is due to personal attributes
>
> teaches students to interpret in terms of their personal weakness.
>
> Instead, give 'process orientated praise' this is focused on the process required for success. For example, praise the student's effort and strategy: 'You really tried hard', 'That was a good way to do it'. Because it:
>
> sells the idea that esteem comes from the use of striving and from the use of strategies
>
> teaches students to interpret setbacks in terms of a lack of effort, or inappropriate strategies
>
> allows every student to earn praise.

> Use also 'task orientated praise'. For example: 'All the labels are correct'; 'There are hardly any spelling mistakes this time'.
>
> (Petty, 2011)

Another way to develop growth mindsets, Dweck suggests, is to tell children stories about the accomplishments that have resulted from effort and hard work: for example, accounts of eminent scientists who were not born to be brilliant but through hard work and a love for their subject developed astonishing talents in their chosen field (Dweck, 2007); and stories about people such as Albert Einstein, who did poorly during his early education, and Thomas Edison, who was expelled from school because of his perceived lack of intelligence. Indeed, research evidence has demonstrated that some of the most innovative and high-achieving people have mediocre IQs. This could be enhanced by introducing children to past students who have flourished through hard work and a passion for their subject. Other methods to foster growth mindsets include using peer tutoring where older students teach younger children, coupling growth-mindset and fixed-mindset learners, developing growth-related induction programmes, and the introduction of computer games where learners are encouraged to work towards progressing from one level to the next through persistent effort (Petty, 2011). Educators should also stress that quick learning is not really the most meaningful learning, and that those learners who sometimes take longer to comprehend ideas learn at a deeper level. By adopting these ideas for advancing growth mindsets, educators are:

> ... transmitting crucial information – telling students that they view them all as having intelligence that they can choose to develop. The teachers are also communicating that their role is not to judge who is smart and who is not, but to collaborate with students to make everyone smarter. (Dweck, 2010: 18)

Dweck also recommends that educators should model taking pleasure in facing challenges and by being fascinated and enlightened by mistakes. She suggests using feedback to students who make mistakes, such as 'Well that didn't work. How interesting! What did that tell us? What should we try next?!' (Dweck, 2009a: 311). Furthermore, educators should show their delight when children are progressing and indicate to the children how they challenged themselves in order to progress. Challenges for Dweck are opportunities for children to develop a growth mindset. She suggests that educators should present:

> ... challenges as fun and exciting, while portraying easy tasks as boring and less useful ... when students initially struggle or make mistakes, the teacher should view this as an opportunity to teach students how to try different strategies if the first ones don't work – how to step back and think about what to try next, like a detective solving a mystery. (2010: 18)

In a similar way Gilbert (2002) posits that educators should teach learners to aim high and use coping strategies when things do not work out as intended, but he argues this should not include disengagement in learning because of the prospect of failure: 'What chance do any of us have if we spend our lives avoiding possible defeat?' (2002: 25). He also uses the analogy of children as small seedlings when he explains that children need nurturing as well as the ability to face challenges and difficulties in order to succeed in learning and in life. Seedlings need to endure 'being "hardened", ready for life beyond the mollycoddling glass walls of the nursery. Without this, when they are finally faced with the ravages of wind, weather and incompetent gardeners, they would not survive' (2002: 25). Similar to Dweck, Gilbert argues that children also need 'hardening', particularly those who are used to high achievement, as they have not necessarily experienced failure. Although it may appear harsh, the more educators do for children, the less children will try to do themselves, in turn generating an ongoing sequence of learned helplessness (Dweck, 2000; Gilbert, 2002). Being honest with the students is also part of this hardening process. Dweck argues that 'growth mindset teachers tell students the truth and then give them the tools to close the gap' (2017b: 203). Yet learned helplessness, where students face failure time and time again regardless of what they attempt and are apt to give up trying, warrants further thought for practice. Such students who tell teachers that they are useless deserve further consideration as they may be trying to say something else. Teachers, according to Castle and Buckler (2021), should attempt to boost the learner's sense of self and perhaps more importantly endeavour to find out why they are feeling that way. Teachers should work with students to develop their sense of self, which is 'far more important than anything on the curriculum: without a healthy sense of self, learning will be hampered' (2021: 191).

An explicit aspect of fostering a growth mindset with children is teaching them that the brain works 'as a learning machine' (Dweck, 2007: 42). She contends that by explaining to children that the brain forms new networks each time they learn, children discover that their abilities can be extended and used to enhance their schoolwork. This contention comes from her research which revealed that students who had been taught about the workings of the brain showed substantial improvement in their motivation to learn. Furthermore, those students had also increased their grades. From this research she developed her Brainology interactive computer program, which teaches children how the brain works, how it changes when learning takes place, and more importantly what learners can do to make the brain work better (Dweck, 2009a). However, it is argued that educators without access to the Brainology program can include the functions of the brain as part of their teaching, particularly during study skills lessons. This can be done by asking children to think about their brains as a muscle which is fortified by use during learning, and also by asking them to picture the brain making new connections as they learn (Pound, 2009).

Feedback from assessed tasks, Dweck argues, needs to give learners a sense of their progress towards mastery. Following assessment outcomes students should be

motivated to tackle tasks they would not have attempted before, thereby enabling them to understand new ideas. In doing this, educators should indicate to learners that it was their efforts in completing the tasks set which led to their progress. She cites the practice, which might appear somewhat unconventional and even questionable, of some educators she has observed during her research who make progress explicit by giving learners pre-tests at the start of a module of study. These pre-tests intentionally include matter which learners have not yet encountered. Then, when the learners contrast their unsurprisingly sub-standard grades on the pre-tests with their much enhanced grades on module post-tests, they become accustomed to the idea that learning improves with application (Dweck, 2010). Another assessment approach educators can use to help children adopt a growth mindset is not to recognise a grade which indicates failure. Again Dweck refers to the practice she has observed during her research, where educators use the grade 'Not Yet', because learners are not embarrassed or humiliated by this grade as they appreciate that mastery will come in time and with application. Dweck explains the significance of this for practice:

> The word 'yet' is valuable and should be used in every classroom. Whenever students say they can't do something or are not good at something, the teacher should add, 'yet'. This simple habit coveys the idea that ability and motivation are fluid. (2010: 19)

In her TED talk of 2014 Dweck advances the use of 'Not Yet' as helping set students on a learning curve for the future, and away from the 'Tyranny of the Now' and the threat of failure. She again asks teachers to consider using strategies which foster focus, persistence and the use of praise that rewards process (Dweck, 2014). A further option, she suggests, to employ in assessment is to include additional growth mindset criteria in the grades awarded to learners. This could include grades for effort, resilience, tackling challenges, and improvement over time (Dweck, 2010).

Finally, Dweck contests that educators also need to consider what type of mindset they have themselves. They should also endeavour to motivate all learners with their enthusiasm and allow time for learners who are labouring to understand concepts (Pound, 2009). Furthermore, she advocates that all educators should be taught the growth mindset and how to employ it with their learners. This, Dweck suggests, can be embedded in teacher education curricula and reinforced during continuous professional development programmes for educators. Such training should include:

a. the latest findings in brain plasticity and the implications for all children's potential to learn
b. the findings that dedication and self-improvement – and not existing talent – bring students long-term success
c. the findings that process praise promotes more lasting confidence and motivation than intelligence praise or outcome praise, and
d. information on the need for students at all levels to be challenged appropriately.

(Dweck, 2008: 14)

Although Dweck's concepts have evolved from her extensive research in US schools, it is suggested that her ideas from practice could be adapted for educators outside the United States.

OVERVIEW OF APPLICATION: IDEAS FOR USING DWECK'S GROWTH MINDSET

Ideas for practice are outlined above for you to consider. Many schools and education settings may already have practices which promote the development of mindsets, but we have listed a few here as a synopsis. You may wish to use this list as a focus for discussion with others regarding applying some of Dweck's ideas for your particular practice.

- Give learners feedback and praise which focuses on process and effort rather than on outcomes, abilities and perceived intelligence (see Petty [2011] above for specific ideas).
- Foster a sense of self for the students - and for themselves.
- Feedback and praise should also include strategies for future improvement which celebrates and builds upon mistakes made.
- Use the principle of 'Not Yet' in giving feedback.
- Consider using stories about how people from different fields of learning have overcome being labelled as slow learners, and through hard work and an enthusiasm for their subjects have become eminent scientists, historians and engineers, etc.
- Endeavour to develop a growth mindset of their own, and model taking pleasure in tackling challenges, learning from mistakes, and being resilient.

SUMMARY

Dweck is an American psychology professor and researcher. She has published numerous works on motivation and self-theories in learning which are capable of being applied in educational settings. Her main concept advances that people can be placed into one of two different groups. The first group are the entity theorists, who think their intelligence is fixed and unchangeable – these people have what Dweck calls fixed mindsets. The second group of people are incremental theorists, who conversely think that their intelligence can be changed and developed through application – these, she argues, have growth mindsets. She holds that educators should endeavour to help children to adopt growth mindsets which in turn would help them become learners who would welcome challenge and hard work. Some of the ideas she advocates to cultivate a growth mindset are the appropriate use of praise and feedback, the setting of challenging tasks, and negotiating with learners'

personal process goals and strategies for learning. Her early research and writings concerned her concept of learned helplessness; this subsequently evolved into her future interest in mindsets and motivation.

Dweck's ideas, particularly the entity theory and fixed mindsets, can be associated with classical Freudian theory where people seek praise and avoid negative feedback. Her incremental theory and growth mindset are closely associated with the ideas of constructivists such as Piaget, Vygotsky and Bruner. Furthermore, her notions regarding self-theories are similar to Bandura's concept of self-efficacy, with positive self-efficacy being aligned with growth mindsets and negative self-efficacy with fixed mindsets. Dweck's ideas on motivation and the concept of scaffolding are also similar to those promoted by Rosenshine.

Her idea that intelligence is a fluid concept has parallels with recent thoughts on intelligence such as Gardner's multiple intelligences and Goleman's emotional intelligence. There are also comparable links between Dweck's thoughts on the importance of hard work and effort and Guy Claxton's emphasis of resilience in the learning process. Criticism of Dweck's work has included the simplistic and over-optimistic nature of her work, especially in an increasingly product-driven educational system. There has also been some criticism of the overemphasis placed on the advantages of developing growth mindsets. The prominence she gives to hard work and effort could, if inappropriately delivered, harm rather than help children. Her sponsorship of the Brainology program has also drawn censure because of her possible impartiality. Another criticism is that her writings are, at times, repetitious in nature. Regardless of these criticisms, her work in promoting children developing a growth mindset has positive, and long-term, implications for learners being motivated to enjoy the challenges of meaningful learning.

GLOSSARY OF TERMS

Contingent self-worth

A notion that children feel that they are worthy when they succeed but unworthy when they fail. Although it is understandable that all children may be disappointed when they fail, some children also leave behind their self-respect and their belief of being a deserving individual. Having a fixed mindset can be a factor in contingent self-worth.

Entity theory

This is the self-theory people hold which posits that intelligence is fixed and cannot be transformed through hard work or application. Entity theorists possess a fixed mindset.

Fixed mindset

People with fixed mindsets stay clear of difficult tasks, and tend to give up and blame others when faced with challenge and obstacles. They also consider that effort and hard work are futile undertakings and tend to take no notice of negative comments from educators.

Growth mindset

Those people with growth mindsets welcome challenges, enjoy the process of learning, react positively and developmentally to their mistakes, and learn from negative comments from educators.

Incremental theory

The self-theory in which people think that intelligence is fluid in nature and that it can be developed by working hard and by resilience. Incremental theorists have a growth mindset.

Learned helplessness

A belief by children that if they fail it is their fault because they are not clever, and that failure is irreversible. They lose their persistence and tenacity as a result.

FURTHER READING

Boaler, J. and Dweck, C. (2016) *Mathematical Mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching*. San Francisco, CA: Jossey-Bass.

Practical examples of teaching and learning methods in mathematics which help children develop creative mathematical mindsets.

Elliot, A., Dweck, C. and Yeager, D. (eds) (2017) *Handbook of Competence and Motivation: Theory and application* (Second Edition). New York: Guilford Press.

A comprehensive text which explores the theory and associated classroom practice related to motivation and achievement.

Gershon, M. (2016) *How to Develop Growth Mindsets in the Classroom: The complete guide*. Scotts Valley, CA: Createspace.

A guide which offers innovative suggestions to enhance children's growth mindsets; in particular how to promote resilience and help children enjoy tackling challenges.

Stevens, G. (2020) *Teaching in the Post Covid Classroom: Mindsets and strategies to cultivate connection, manage behavior and reduce overwhelm in classroom, distance and blended learning*. Mountain House, CA: Red Lotus Books.

A topical American guide which, apart from the development of mindsets, has an abundance of practical ideas for teaching and learning in a post-Covid world.

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