

**How can I develop an 'Expandable Intelligence' using Lucas and Claxton's 'Expansive Talking Framework' in maths?**

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**Abstract**

This paper is a personal reflection of a student teacher's decisions and actions towards trying to support pupils in developing the belief that their intelligence is expandable through effort and strategy. Using action research in their last year of teacher training I researched my influence over 30, aged 7-8, pupils' attitudes towards maths learning over 8 weeks. Using Lucas and Claxton's (2010) Talking Toolkit framework, which claims to support the development of 'Expandable Intelligence', to promote a growth mindset. This was done over a period of 8 weeks. In a reflexive turn it was identified that the Talking toolkit framework tool could not be used in isolation, other strategies and approaches were adopted. This research illustrates a reflection on pupils' responses and my analysis against four habits of mind, chosen from Claxton (2002) Building Learning Power that supports the belief that intelligence is expandable. This research provides an example of a constant reflective log of my findings. The key finding from this research was that attitudes have the potential to be developed in the short term and expandable intelligence is a state of mind that transcends experiences and cannot be seen in just mathematics. This paper concludes with implications for future practice.

**Introduction and Background**

An individual's mind-set is their outlook on events (Dweck, 2006). The mind-set can influence what Lucas et al (2013) refers to as 'habits of mind,' which is your attitude towards a task. I have always been interested in different approaches children adopt with regards to their learning. Can you teach effort and can you create an environment which develops resilience? The idea for my study initially stemmed from conceptual understanding in maths, the notion of deep understanding. I then pondered if children want to learn and if I can influence this. I was pointed in the direction of Lucas and Claxton's (2010) book: *New kinds of smart*. This is where I came across the view that intelligence is expandable; it can increase through effort and strategy. I decided to embed the 'Expansive Talking framework' (ETF) in to my teaching to create a learning environment where the dispositions to learn and 'build learning power' (Claxton, 2002) were tackled.

This study focuses upon the impact, and to what degree, teachers have over fostering 'expandable intelligence,' in the classroom environment. The data collection was undertaken in a two form entry Primary school in Essex. The children were predominantly from a White British background with a below average number of children who receive free school meals (DFE, 2014). 31 7-8 year olds were included in this nine week study.

**Rationale for my study**

I strongly hold the view that every child should value their intelligence as a capacity which can increase with purposeful effort. Lucas and Claxton (2010) suggest that intelligence is not easily measureable, possibly due to the fact that every experience is situational. This is why my study is highly contextual and responsive to mine and children's needs, as my effects needed to be measured. Significantly this motivation became stronger after reading 'The Unseen Children Report'

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(Ofsted, 2013). It presented the view that expectations can have more of a negative impact than material poverty. Resnick (1999) states that any maintained environment (learning or home) has the potential to affect the children's behaviour, due to expectations. This provides a place for my research; as we infer the need to analyse our own actions to increase awareness and effects of interactions with children. If we consider Duckworth's (2013) claim that researchers understand the internal and external nature of motivation to learn, but there is no unified approach to achieve this, then my research focus gained credibility as I aimed to assess my impact with critical engagement, in contextual situations. If we want children to value effort then they have to hold the belief that their intelligence can improve, thus presenting the idea of 'expandable intelligence.'

### **Literature review**

Research tells us there is much debate surrounding intelligence. This literature review will explore the field of research around the notion of 'expandable intelligence:' the belief that, through effort and strategy, intelligence is a capacity which can increase (Lucas and Claxton, 2010). My analysis begins with the works of Lucas and Claxton and the concept that intelligence is expandable. From here I touch upon areas of psychological literature, as Lucas and Claxton's ideals draw upon such findings. Alternatively, I explore opposing views to 'expandable intelligence' and finish focusing upon environmental influences; this is where I find a place for my study.

Firstly, the idea that intelligence has the capacity to expand and grow through effort is a concept which Lucas and Claxton (2010) emphasise should be the attitude which drives pedagogy in education. 'Expandable intelligence' transcends beyond the training of skills and holds the aim of adopting what Claxton (2007) refers to as 'cultivating dispositions.' A skill or capacity (skills and strategies) becomes a disposition when it is independently applied. This application is what Perkins (1995) refers to as 'sensitivity to occasion;' and will show whether the learner understands the skills deeply enough to be able to apply them in appropriate learning situations. In turn this involves a development of attitudes or 'habits of mind' (Lucas et al, 2013), which support children meeting the demands of this world, which extends beyond a testing culture (Lucas, et al, 2013), as ultimately this focus on achievement can oversimplify learning (Stobart and Gipps, 1997). This implies that not only should learning involve depth but a positive attitude; (habits of mind) to support the motivation to achieve a disposition, ultimately stretching beyond superficial teaching and learning.

Furthermore is it important to consider that Lucas and Claxton (2010) draw from the works of Dweck. Dweck adopts a psychological stance to education; her extensive research is based up on the beliefs people have about themselves and the impact they can have. Dweck (1999) identifies two mind sets, which ultimately change the way education is viewed. If you hold a 'fixed mind-set' individuals believe they have a certain amount of intelligence and therefore this will need to be proven. They have a tendency to opt for easy asks to ensure they are successful (Dweck, 2006). It should be questioned, if the aim is to learn, whether task completion is an appropriate measure of success, especially if 'expandable intelligence' values the learning process and exerting effort. A 'growth mind-set' however views intelligence as something which can increase through effort and therefore those who hold it thrive off challenges. This suggests that if it is possible to cultivate the belief that intelligence is expandable then work needs to focus upon creating an environment in which the ideals of 'growth mind-set' are promoted: making mistakes, effort, resilience and learning rather than end product goals (Dweck, 1999).

Additionally, reasons for a focus on the learning environment can be explained through Bandura's (1993) reference to the attribution theory which involves an individual's self-efficacy. How the child views what has happened can affect how they view themselves within this situation. Weiner (1972) explains the attribution theory through the 'Locus of Control.' He states that outcomes can be attributed to internal or external characteristics retrospectively: i.e. ability, effort or task difficulty

and luck. This attribution could be reliant on the individual's mind-set (Dweck, 1999). We may speculate that children need to be in an environment where if they 'fail' their ability is not compromised, rather a lack of effort. This then places children in control of their learning (Watkins, No Date) and promotes the value of effort.

The psychological literature presents how learning can be affected by an individual's belief system. If we refer to Ofsted (2013) that the environment can have a greater impact on confidence than any material poverty, we begin to view that it is those who interact with children that can have an impinging role over the development of a mind-set. We therefore infer the significance of the learning environment. Black and Wiliam (1998) emphasise the importance of formative assessment (a process undertaken by teachers and should be responsive to the child's learning needs). It is however only beneficial if focused on the learning process (Clarke, 2005). Lucas et al (2013) question if this assessment involved monitoring of growth in learning dispositions. If learning is viewed as an ongoing process (expandable) then grade only feedback, as a form of assessment, ultimately places emphasis on the end product (Butler et al, 2013). Claxton (2007) places emphasis on a teacher's language and states it is not only that thoughtful interactions but instinctive responses also contribute to the classroom environment (Lucas et al, 2013). This suggests teachers reflect and evaluate their practice; especially if 'expandable intelligence' ventures beyond isolated strategies (discussed later).

Moreover, Claxton's, (2002) work on 'Building Learning Power' (BLP) links with the idea of cultivating attitudes. These attitudes arguably require an environment which supports them. He prioritises resilience, resourcefulness, reflectiveness and reciprocity (The four R's) as optimum 'habits of mind.' This fostering of attitudes sends a message that everyone is capable of improvement. Piaget (1950) states: intelligence is the capacity to respond and act when you do not know what to do. This suggests intelligence is contextual as every situation is different and therefore we arguably need to be 'expanding' intelligence to help understand new situations. Without a 'growth mind-set' view there will be less emphasis on 'the four R's and positive attitudes to learning. Fletcher and Hattie, (2011) argue that even if 'growth mind-set' and 'fixed mind-set' are not reliable, an environment which adopts the ideals of a 'growth mind-set' will help to foster the attitudes needed to develop a disposition to learn (Lucas, et al, 2013).

Alternatively, some pieces of literature and theory focus on intelligence not as a complex process but simplify it to increase understanding. Gardner (1993) created a list of 'Multiple Intelligences,' which without intention of the creator, led to the belief that you are intelligent in certain areas. This categorisation may lead to demotivation and a lack of effort as you are labelled as being skilful in certain areas and therefore not in others. This could result in children attributing learning outcomes to therefore a lack of ability (Bandura, 1993. Weiner, 1972); which places the emphasis on the fact that intelligence is a fixed capacity. Coffield et al (2004) also simplified intelligence but in how it is obtained. Individuals are diagnosed with how they learn best (visual, audio, and kinaesthetic). Even though this helps children recognise their areas of development and their strengths, it may segregate children (Stahl, 1999) and reduce their effort in the areas of development. This does not have the aim of encapsulating the children in an environment where expectations are that everyone can improve.

Significantly, Langer (1997) adopts an approach to intelligence which explored the abandonment of categories and instead focuses on relationships between different situations. This indicates that intelligence should not be tackled as an overarching capacity but contextually. This then removes the trap of approaches which are tokenistic (Perkins, 1995), because 'habits of mind' (Claxton, 2002) are cultivated to help children approach learning with resilience and positivity rather than using strategies which may not transfer to different contexts. This is significant if we consider if focus is

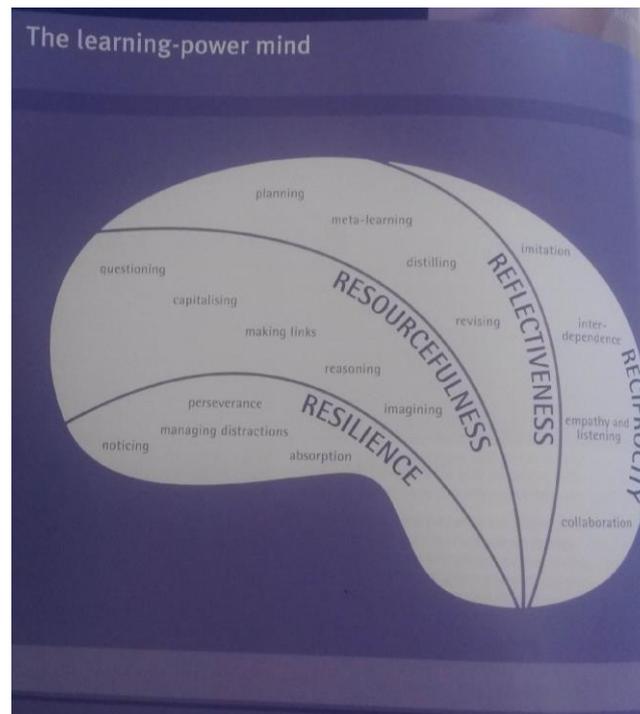
placed on what is fixed then the current level becomes a structural limitation (Claxton, 2007), rather than a starting point for intelligence to be expanded.

Significantly, this is where we reach the place for my research. 'Expansive intelligence' depends greatly on the external environment which creates implications for me as a student teacher. This increases the validity of Lucas et al's (2013) claim that teaching should be evaluative, to increase awareness of habitual and instinctive behaviour (Brookfield, 1995), and adapt it in light with what it valued (Hodgkinson cited in Denzin and Lincoln, 2005). Self-study becomes necessary to ensure that I am promoting 'expandable intelligence,' and not tokenistic views (Perkins, 1995). I circle back to the works of Lucas and Claxton to support my goal of creating a suitable classroom environment, one which views intelligence in light of what will best benefit children's learning. It is arguably as Robinson (2013) states; children are waiting for optimum conditions to grow: teaching is a matter of climate control.

### **Methodology**

My methodology was within the research frame of teacher enquiry. I was aiming therefore to develop my teaching practice (Thomas, 2009). Whitehead and McNiff (2009) state that teacher enquiry combines diagnosis, action and reflection; this then places my study in an interpretivist paradigm (Thomas, 2009), as my position was valued in the process. My decisions therefore were driven by my main focus of self-study; analysing my actions with regards to developing 'expandable intelligence.' I decided to use the ETF (Lucas and Claxton, 2010) to generate and support children's reflection as Lucas and Claxton refer to this strategy, under the idea that intelligence is expandable. Importantly, Denzin and Lincoln (2005) argue that teacher enquiry has the potential to explore theories which claim to achieve a goal – this ultimately provided the basis for developing my own critical insight, allowing decisions to be made with regards to application of theory while also keeping children's learning (expansive) at the heart of the study (Ruddick and Hopkins, 1985).

Initially I engaged with the children in one to one situations, as I thought this would be less intimidating (Cohen et al, 2011). I found however that little critical discussion was generated. Brookfield (1995) argues that by definition reflection is not critical. Cohen et al (2011) also emphasises the need for reflection to be evaluative, to ensure the children are benefiting from the findings. After modification, my data collection involved whole class discussions (31 children). I decided to document this using an audio recorder to provide an accurate record of a particular interaction (Hopkins, 2008) (Expansive talking framework). This was ethically considered and approved by University tutors and the Head teacher. Additionally, main discussion points were scribed on the interactive whiteboard to keep track of key findings. Lucas and Caxton (2010) state that the ETF should be used to help children focus on how much their minds can grow. I however did not find this a sufficient measure for the success of the ETF, due to the vagueness. I therefore embedded ideals from Claxton's (2002) book on Building Learning Power. The four R's of learning (Figure 1) will track developments in the stated 'habits of mind'.



**Figure 1.** The learning power mind (Claxton, 2002).

Furthermore, I also documented findings outside of the context of discussion (Whitehead and McNiff, 2009). This was important as it provided insight into my influence on children's behaviour; it is this effect that Loughran (1996) states teachers have responsibility over. I therefore kept a reflective log of maths lesson evaluations. This was important as teacher enquiry aims to show developments over time rather than an end result (Whitehead and McNiff, 2009). These reflections were completed after the lesson, which allowed for more objectivity (Schön, 1991) as there would be time to reflect upon developments and then the implications for actions. This is diagrammatically shown through Kemmis and McTaggart's 'spirals of thinking' (cited in Hopkins, 2008). Observations therefore provided increased scope to further understand the situation (Thomas, 2009). This is relevant as, without observation, an occurrence may go unnoticed (Cohen et al, 2011. Mason, 2002). My observations were semi-structured (Thomas, 2009) as I adopted changes throughout the nine weeks and wanted to keep the data collection the same to ensure consistency. I then drew on Whitehead and McNiff's (2009) idea of living theory, as I continually referred to theory and embedded this in to practice, whilst evaluating my findings to inform my next actions.

### **Analysis and Discussion of Finding**

Throughout my engagement with teacher enquiry I was able to analyse and evaluate my effectiveness regarding my strategies, approaches and responses to then make appropriate adaptations. My analysis is encapsulated within the idea of 'expandable intelligence,' and will therefore draw on its ideals.

Initially the ETF attributed time for children to reflect on their learning in an analytic manner. My analysis predominately followed a chronological order analysing my influence over developing an 'expandable intelligence' in maths using the ETF. I deviated from the chronological order to illustrate changes in behaviour, from myself or the children. It should be appreciated that there were many strands of thought which could be analysed. I have however chosen those which I feel best reflect the influence I had over developing 'expandable intelligence' within the children. I italicised the

characteristics of Claxton's (2002) 'habits-of-mind' throughout the analysis to make it easier to identify when I linked the children's behaviours.

### Early stages of using the expansive talking framework

Initially, the ETF was implemented while the children were in the learning process I asked questions from the template (Figure 2). This aimed to initiate thought about approaches and attitudes to tasks, and allowed them to adapt their strategies while they were in the learning process. This linked to Langer's (1997) situational focus encouraging children to look at their learning as a matter of steps.

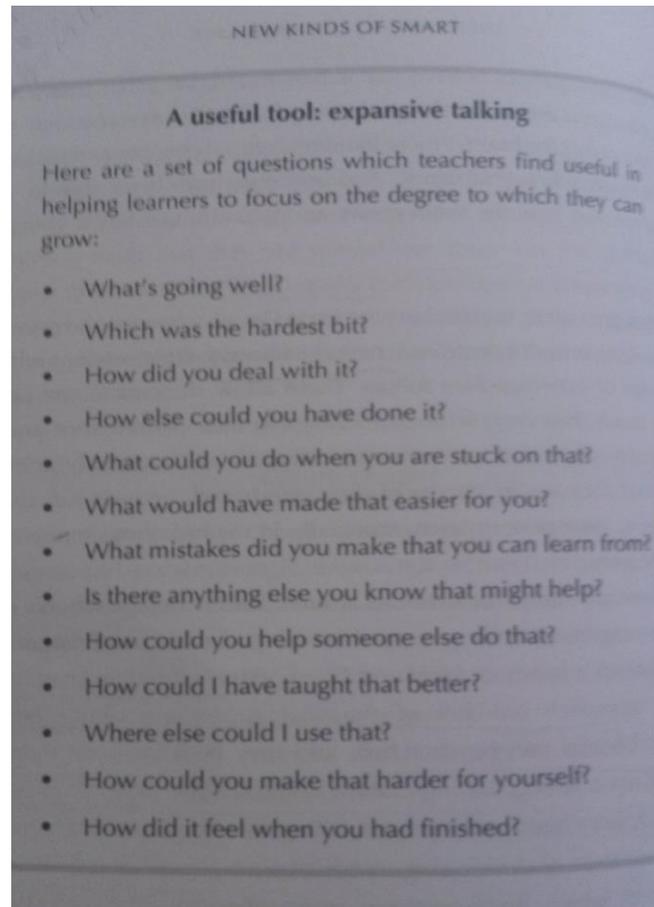


Figure 2: A useful tool: expansive talking (Lucas & Claxton, 2010).

In this early stage, there was a lack of probing questions which limited the children's reflective engagement. The responses therefore may not have provoked deep thought, which ultimately limited opportunities for the children to see *links in their learning*. For example: 'worked together in groups,' shows a response which needed further exploration to help children reflect deeper about what they can do to help themselves if they are going to increase their ability to *make links between their learning*. Additionally, if we consider that Evie said she 'found it really hard;' without probing of why this process could have the opposite effect (viewing effort exertion as negative), especially if she did not overcome the difficulty. At this early stage the children arguably showed a lack of *resilience and appreciation of effort*. The evidence suggests that implementing the ETF without deeper questioning did not effectively support development of 'expandable intelligence.' My reflection (lesson evaluation) showed recognition that I needed to model my thinking. This however was not specific as to how or what, indicating that I lacked the reflective capacity to model this effectively to the children.

Despite this, the ETF provided the children with focused questions to think about what was involved in their learning. Even though the children stated that they valued their peers' support, at this stage, we could consider to what extent the children answered the question on par with what they thought I expected, especially if I did not question the children further. This was something I began to identify. This may become useful in preventing superficial responses with little critical engagement. Interestingly, the children interpreted helping someone by reducing the task's complexity, portraying a lack of *resilience*, and therefore indicating a fixed view of intelligence. Dweck (1999) argues that children who value learning (growth mind-set) see challenge and difficulty as part of the learning process. In order to present this to the children they may need to explore difficulties and obstacles to then overcome them, aiming to increase *perseverance*. Potentially the ETF laid foundations for this through reflection on overcoming difficulty. If it is then supported with probing questions encapsulated in discussion.

### **Using the expansive talking framework in the context of whole class discussion**

Consequently, in response to previous observations I began to use the ETF in plenary sessions, with the whole class to stimulate, lead and model reflection. The previous application asking the children the questions and scribing their responses, arguably separated the ETF from its primary aim: talk. This may have limited the potential depth modelled and criticality of reflection to the children. It therefore would be less likely to create a class environment promoting 'expandable intelligence.' This adaption enabled ideas to be linked and articulation regarding the value of effort and learning from peers. For example, Hannah identified a strategy to support her learning. Due to the nature of discussion the ETF allowed this development to be drawn upon to help Jessie see the value of applying what she already knew to support her; and demonstrate the value of *reciprocity and within this imitation through listening*. Hannah's engagement showed that she was able to identify where she needed support. She demonstrated an initial stage of *resourcefulness*. This interaction supported me in modelling and articulating the behaviours and attitude I expected.

### **Development of my thinking**

Moreover, I began to realise that if 'expandable intelligence' was to be fostered it needed to go beyond the ETF. Previous reflections led to the decision of implementing a self-assessment strategy to possibly supplement not only the ETF but to develop the children's *self-monitoring*. Significantly if 'expandable intelligence' is to be fostered there needs to be support and encouragement. From observation I found three children lacked the capacity to work independently for a sustained period of time. This conveyed that they lacked the *resilience to manage distractions and persevere*. If children are to value effort in their learning they need to experience learning when effort is exerted. I implemented a traffic light self-assessment tool, which focused on task difficulty but recognised perseverance when an aspect of learning was difficult (Figure 3). This also showed that this strategy potentially acted as another form of communication. Fariah's response implied a change in the message I sent to the children (Watkins, 2009). I realised the importance of not only my responses but my actions which draw light to what I value in the classroom. As a result of using this self-assessment strategy, in subsequent lessons I observed the increased time these children spent unaided on tasks, which showed *increased perseverance and ability to manage distractions*.



**Figure 3.** Traffic light assessment tool.

Furthermore, children were beginning to show *increased signs of resilience*. This was revealed through children articulating their experiences with regards to overcoming barriers within the process of learning. This suggests that they *monitored their learning*. They then responded to their analysis by backtracking to a point where they, 'felt like they were on the right tracks.' I started to show consistency with probing and responding to the children in light of the learning process. This may indicate that, through reflection, I have built upon the children's responses and the positivity of certain behaviours and attitudes. An example of this was when I emphasised the positivity of Megan's behaviour, through sharing her strategy with the class. Megan, without prompting acted out behaviour which arguably was influenced by the ETF and therefore my influence. This may show a realisation in Megan that she can rely on what she knows to help her. She may be showing initial signs of *resourcefulness*. I began to find it useful to explicitly share with the children my expectations and the behaviour I expected.

I found this especially powerful when I modelled to the children that I was also a learner. This was in the form of asking them how I could improve. This arguably not only stimulated thinking about their learning in terms of what support they needed but I demonstrated that I was also part of the learning environment. Considering that I did not start off asking the question straight away this also suggests a development in my confidence to be open to criticism. Especially when we consider that few people have the confidence to open up to criticism (Brookfield, 1995). This created a powerful message for 'expandable intelligence,' showing that anyone, even the teacher, can increase their intelligence and improve.

### **A supportive environment**

Even though my research involved the whole class, there were certain individuals who displayed a clear change in their behaviour, which arguably was influenced by my reflective adaptations in thinking and behaviour. I found I began to respond to the children's reactions to tasks by voicing my opinions about learning. Sam demonstrated that he was not confident in his ability and possibly valued his peers' opinions, *showing a lack of collaboration, empathy and listening capability* at the beginning. I therefore responded to Sam's crying by emphasising that mistakes are part of learning. This showed I was beginning to embed the idea of 'expansive intelligence' in the classroom environment. This could portray a 'fixed mind-set', where his 'failures' are perceived as challenging his ability (Dweck, 2006), suggesting a general *lack of resilience*.

Remarkably, in just three weeks, Sam began to show signs of *perseverance, revision and mounting up to a sign or resilient behaviour*. He identified an area where he struggled. Even though he was not able to articulate how he tackled the problem, maybe because he did not address the difficulty, he was accurate in his self-reflection. From this I observed the progress Sam made as he did not get frustrated when he struggled instead *showing perseverance through monitoring his learning*. In later examples Sam became more open in his responses. This suggests that he has become more confident in the classroom environment and is not as nervous about being wrong. I would not conclude that Sam has developed a disposition to learn; but he may be beginning to view himself as a learner.

Consequently, a few of the children began to model this attitude. This did not mean that I successfully fostered a belief in 'expandable intelligence.' But it did portray that I started to create an environment in which effort and encouragement were valued. Additionally, it should be considered that this might have been achieved through actions beyond the ETF. For example I became more articulate of the behaviour I was looking for, *in this case perseverance*. To begin with Hannah portrayed that she was recognising her mistakes as learning opportunities. Furthermore, Appendix 1 shows that Hannah extends further and demonstrated she would help her peers through promoting a positive view of effort. She also viewed challenges as learning opportunities possibly portraying a GMS (Dweck, 1999). She arguably became more reflective on the attitude and approach she had to tasks. The ETF gave her opportunities to think about the specific parts of her learning, with a positive attitude. *This might not show behaviours as far as capitalising but she made links to other skills to aid her*.

Significantly, near the end of my research I found more children engaged with whole class discussions. Rosie was confident enough to articulate her learning. This was similar with Victoria (who was part of the traffic light self-assessment group). She not only volunteered a response to the ETF, which portrays the development in the inclusiveness of the classroom environment; but she focused on the steps in learning *which presents a beginning stage of reflectiveness*. Engagement with the ETF within an inclusive environment has possibly helped her articulate her learning and reflect on the process.

### **Valuing learning process over the end product**

Furthermore, the emphasis I placed on the learning process rather than the end product could be argued to have an impact when we consider Alex's responses to the ETF. At the beginning of the practice Alex showed that he only valued obtaining the right answer, *which showed a lack in perseverance and absorption as well as collaboration. He interacted with someone but was not engaging in the process of learning*. However, Alex supported his peer by explaining how they reached the answer. This could portray how the ETF and focus on the process of learning has demonstrated the value of helping others. It may have challenged their thinking and made them think critically about their learning and experience how their intelligence can be increased through time and effort (Lucas and Claxton, 2010).

### **My learning**

The ETF has enabled me to monitor the effect and changes in children and my behaviour. I have seen a change in my responses and mind-set through engagement with the ETF. For example my increasing awareness of language: 'mistake' was shifted to 'learning step'. This implies increased *meta-learning and reflective nature linking my actions to the consequences* (Lucas, 2013). It maybe the subtle change in language that demonstrated to the children what I valued. I became more vocal about the ideals I was expecting in the classroom – valuing of mistakes and learning process. I would argue that the ETF gave me the focus in which to analyse my actions in light of the children's

responses. It gave me a focus and structure – and made me realise the importance of the environment beyond what you thoughtfully say. Through reflection I became more aware of my habitual behaviour and made a conscious effort to think about what I say to the children outside of the ETF as this also contributes to the learning environment. I would argue that in Brookfield's (1995) terms, I have become more critical.

### **Concluding Remarks**

From this experience I adopt the view of Denzin and Lincoln (2005): I may not have changed everything but I may have improved something. The benefits from this study present themselves in the realisation of the impact I obtained over fostering children's positive attitudes toward learning. A teacher is a model in the classroom, I now have a more secure rationale for the model I am going to be and the environment I am going to create. This is reliant on my engagement with teacher enquiry.

Out of my data I arguably found common themes, which were developed throughout the nine weeks, it was these themes which led to the last section of my analysis: the creation of a supportive environment. I found that through my emphasis on the learning process. The children became more reflective on the learning process. They also began to collaborate more but with more focus on understanding rather than achieving the end result. Encompassing all of these I found the children's resilience increased and this arguably could not be achieved without a supportive environment which was built upon the foundations of my responses and behaviour. I based my analysis on Claxton's (2002) 'four R's of learning power.' Even though I identified elements; I would not go as far to say the children have obtained these attitudes. As Resnick (1999) states: an environment needs to be maintained if behaviour is to change, therefore this process has arguably been a starting point in developing the belief that intelligence can be expandable.

Despite the success it should be appreciated that there were flaws throughout the study. With regards to my data collection I did not include any measure of change at the beginning or at the end to show clear developments. My conclusions were drawn solely from my reflections. To increase the validity of my results in the future I would include a questionnaire at the beginning and end to determine if the children's view of intelligence changed. It should be considered if my actions altered a mind-set or if they drew out ideals already innate within the child. However even it is the latter this is still a positive move; as the children will have explored an environment where effort can change outcomes, providing a better chance of confidence, self-belief and determination to be instilled.

### **Implications for the future**

Upon reflection I could have embedded the notion of 'expandable intelligence' further. This could have been through, encouraging the children to independently engage with the ETF. Prompt cards (with questions from the ETF) could be used to stimulate discussions, possibly in the middle of a lesson to get the children reflecting and thinking what their next step in there learning could be. Additionally, the ETF questions could be embedded in marking schemes to create a reflective dialogue between teacher and learner. It is these ideas which may require a whole school approach. Expansive Education Network (no date) refer to the necessity of sharing research and findings. This emphasises the importance of developing a classroom environment which promotes 'expandable intelligence.' This arguably is the way forward: to encourage criticality and improvement of practice in line with what will benefit a child's attitude to learning.

I now return to Lucas and Claxton (2010) and the idea of intellectual growth. They argue that the best gift for a child is to teach them 'the willingness to persist in the face of difficulty...to be intrigued by mistakes and to keep learning' p38. This becomes a gift if we consider the changing nature of the world and its demands. Claxton (2002) emphasises that it is the 'habits-of-mind' which may equip

children with all the need to not survive but thrive. The nature of the unknown calls for a mind-set which compliments a development of the 'habits-of-mind' (Claxton, 2002) which encourage a disposition to learn; as your actions are underpinned by how you view yourself and the world (Dweck, 1999). This is why time needs to be taken to reflect as 'expandable intelligence' is very much about my learning as it is the children's.

I finish here with a few last words on the reflective journey I have experienced. Engagement with this study enabled me to realise that you may think you have a certain outlook/mind-set, but do you actually practice it, or do you fall in line with the expected norms? Experience therefore has shown me the importance of self-reflection and the value adopting a critical approach. I would question if before this process I was aware of what mind-set I was promoting. I would question if I was aware of the implications or impact my responses could potentially have on children's attitudes about themselves. I see self-study as something ongoing, something which has potential to change attitudes; and a process which results in you viewing yourself, others and the world from different perspectives because the results may be surprising and ultimately life changing.

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Appendix 1

