

Can learning about ‘mindsets’ improve pupil confidence?

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Introduction

Among the teaching staff at my current school “I cannae dae it” [I can’t do it] is often jokingly referred to as our school motto. This stems from the repeated utterances of this phrase by our pupils, even when presented with tasks which are clearly within their zone of proximal development. I frequently observed this phenomenon in my own classes and set out to change the mindset of the pupils in one class and, in doing so, improve their confidence for learning.

Section 1 – Background & Rationale

The aim of this intervention was to raise the confidence for learning in my S2 biology class. The class consists of 18 pupils who chose to study biology in S2/3. As our school currently enters pupils for SQA exams in S3 instead of S4, these pupils have been coursed according to their achievement in their S1 science assessments. This class consists of the lowest achievers in S1 science and will be entered for either Intermediate 1 or Access 3 biology. I teach this class for three one-hour periods per week; Monday at 0835, Tuesday at 1050 and Wednesday at 1435.

In order to raise the confidence the pupils display in class, I set out to teach them about mindsets (Dweck, 2006) and encourage them to consider their own mindset. This intervention consisted of a series of mini-lessons on mindsets running alongside their normal biology lessons for three weeks. This was followed by two weeks of ‘normal’ biology lessons whilst trying to utilise the ideas discussed during the mini-lessons. The intervention also incorporated two observed lessons and a lesson on the use of learning journals.

Having completed one full term of teaching this class, I observed that many of the pupils expected to be unable to complete tasks which I judged to be within their grasp. They displayed very low

levels of confidence, even when presented with an activity I would expect them to enjoy. A review of the literature suggested that pupils may lack confidence in class due to a lack of belief in themselves (Fairbrother, 2000). This lack of belief can then manifest itself as a lack of interest and an unwillingness to try (Wood, 1998). While these ideas suggested reasons for the behaviour I was observing, they did not suggest a way of improving self-belief and altering behaviour. Dweck (2006) suggested a possible solution. She argues that everyone can either have a fixed or growth view of their ability and intelligence, or their 'mindset'. Dweck (2006) also suggests that learning about mindsets "can cause a big shift in the way people think about themselves and their lives".

Through sharing Dweck's ideas on mindsets with the pupils and encouraging them to consider their own views on their ability and intelligence, I hoped to find a shift in the mindsets of the pupils in the class. If this was the case, pupils should begin to show a greater willingness to attempt set tasks and persevere when they prove to be challenging. Having said this, attempting to raise the confidence and self-belief of 18 S2 pupils over the course of six weeks was an ambitious aim. It was therefore necessary not to anticipate uniform enhanced confidence across the class, but small and varied progression.

In order to evaluate the intervention, it was necessary to gather evidence from a variety of sources to triangulate any changes which occurred. I proposed five such sources of evidence:

- Pupil interviews
- Questionnaires
- Lesson Observations
- My Learning Journal
- Pupil Learning Journals

Although not all of these methods of evidence collection proved successful, those that did suggested that a number of the pupils had begun to change their mindset and show a greater confidence for learning as a result of the intervention.

Section 2 – The Process

The aim of this section is to describe and reflect upon the processes used in this intervention. I intend to carry this out in chronological order, thereby ‘telling the story’ of my intervention as it happened.

Obtaining Permission

Before commencing with the intervention, it was necessary to inform and obtain consent from my line manager, Head Teacher and the pupils (Burton & Bartlett, 2005). I began with an email to the Head Teacher, PTC Science, PT Learning Support and PT Pupil Support explaining the nature of the intervention and seeking their permission to proceed.

Having received permission from my school, I then discussed the intervention with the class and distributed a letter to the parents and guardians of the pupils. This letter explained the purpose of the project and outlined the way in which I would deal with the data gathered. I explained that their child’s responses would be included in this assignment, but would be made anonymous. All parents returned a tear off slip acknowledging receipt of the letter.

Burton and Bartlett (2005) point out that the respondents should have access to the findings of the intervention. This is not something which I included on my letter to parents, or in my discussions with the class. I intend to address this by posting a summary of my findings on my department’s website in due course.

Collecting Baseline Data

Prior to making the proposed changes, I needed to gather evidence to show the confidence for learning of the pupils. This was necessary to ensure that the planned intervention was needed, and also to allow a comparison to be made and evaluate impact. Throughout the process of collecting

this data, I was conscious of the need to do so in an open way to allow the pupils the opportunity to express their thoughts and opinions as fully as possible. Measuring ‘confidence’ is a challenging task and not well suited to data collection methods which restrict the possible responses, such as many questionnaires. I therefore employed quite unstructured methods.

I began the process by individually interviewing three pupils from the class. I was aware of the need to select the interviewees carefully (Burton & Bartlett, 2005) and therefore decided that the most useful candidates would be those who had most clearly displayed symptoms of low confidence in class. Each of them had displayed significant examples of the traits described by Dweck (2008) such as ‘not caring’ or stating ‘I can’t do this’, both of which she attributes to having a fixed mindset. I felt that by choosing pupils who appeared to be very ‘fixed’ I would most clearly be able to evidence any improvements. In order to put the pupils at ease and allow them the greatest opportunity to share their thoughts on their behaviour, I chose to adopt a fairly unstructured interview format. Burton & Bartlett (2005) explain that the unstructured interview is used “to place more emphasis on the respondent’s own account”, which was precisely my intention. They also point out however that the “researcher must be careful not to lead the interviewees” (Burton & Bartlett, 2005). I found this to be quite challenging, which is not surprising given that Bell (2005) describes unstructured interviews as requiring “a great deal of expertise to control”. The pupils were not overly forthcoming with their answers and it was therefore difficult to avoid asking leading questions. I followed a similar format in each interview. I started by putting the pupils at ease and asking them a general question regarding their progress in biology. This was followed by a question ascertaining their likes and dislikes in the subject. I then tried to find out what the pupils found difficult in biology, and crucially, what strategies they used when confronted with difficulties in class. These interviews were recorded electronically without notes in an attempt to keep the interview “relaxed” (Burton & Bartlett, 2005).

I then turned my attention to an observed lesson. I had always intended to ask a colleague to observe the pupils before and after the intervention to provide evidence of the pupils' approaches to learning from an objective perspective. I now feel that, in many ways, this was the most crucial piece of evidence for this intervention. As Burton and Bartlett (2005) point out in their list of the strengths of observation in data collection, "the researcher can see whether the subjects in the observation act as they say they do". Given the difficult nature of the content of this intervention, there was clearly going to be a difficulty for the pupils to communicate their own feelings of confidence, so I was extremely interested in the independent observations of them in class. I had originally intended for the observation to take place during a "normal" biology lesson. However, in the feedback from my proposal it was suggested that I "set an experimental task prior to the intervention that involves learning new practices – and record resistance to this as compared with another such task after the intervention". I decided to adopt the idea using lessons from the Thinking Science programme (Nelson Thornes Ltd, 2001). These lessons involved the pupils carrying out activities which explored the concept of correlation, a concept which poses difficulty for many pupils. The observer was therefore able to witness the behaviour of the pupils in a very challenging situation. The observer was the school's PT Pupil Support, who is familiar with Carol Dweck's work. She was therefore able to both observe the pupils' mindsets and probe their reasoning and understanding to evidence any progress. Again, a qualitative approach to data collection was taken due to the complex nature of the behaviours being observed and recorded. I also supplemented the observations from the baseline lesson with a questionnaire. This was a last minute addition which I prepared earlier the same day. I added the questionnaire to find out directly from the pupils how they felt about this challenging lesson in a more quantitative manner. Unfortunately, there was insufficient time for the pupils to complete this properly. If I were to repeat this intervention, I would have made more time to allow the pupils to reflect upon and share their own approach to the lesson, as even in this rushed manner it did generate some interesting

responses. However, given that it had been so rushed on this occasion, I decided not to repeat this at the end of the intervention to allow more time for the observer to note the behaviour instead.

Learning Journals

I stated in my proposal for this intervention that I would have a ‘check out’ activity at the end of the lessons:

“This will take the form of quiet reflection by the pupils, followed by the pupils recording their learning and/or thoughts from the lesson in their learning journals. I will encourage them to focus on their ‘mindset’ at this time.”

I even went so far as to state that these learning journals would be the “the primary source of evidence” for the intervention. My primary concern regarding these learning journals at the proposal stage was the level of literacy of the pupils. I was worried that the pupils would struggle to write out their learning and thoughts on their own. I thought I had discovered a solution to this problem at a University seminar when one of my peers suggested that the pupils could complete learning journals as a group. I felt that this would help the pupils, as they would be able to discuss their learning before committing it to paper. With this goal in mind, I dedicated a section of a lesson to introducing the idea of learning journals prior to starting the intervention. To do this I asked the pupils to record their learning in groups from their biology lesson. They seemed to complete this quite successfully, so I presented them with large pieces of flipchart paper which were to serve as their journals for the intervention.

As the intervention progressed, I tried to make time during each lesson for the pupils to record their learning. It quickly became apparent however that I had not succeeded in getting the pupils to use the journals as a “vehicle for reflection” (Moon, 1999). Instead the pupils were simply making notes on the content of the mini-lessons. In my own learning journal I recorded the following critical incident “Are the learning journals proving to be a distraction? Are they doing anything?”. I

began to consider the reasons for the failure of the pupils' learning journals. One possible explanation was the lack of time devoted to them. Keeping a journal which records reflections in one's learning is actually quite challenging. I have only recently begun to keep one myself and have always found it difficult to maintain one in the past. Why then should I expect the pupils to be able to keep a reflective journal after one brief introduction to the idea? This lack of emphasis also relates to another possible reason for their failure. Moon (1999) lists a number of reasons for keep a learning journal and does not include "provide evidence for an assignment" as a reason. It dawned on me that my primary purpose for the pupils keeping these journals had become providing evidence for this assignment, and this is probably why they were not implemented as they should have been. I did not have the time to revisit the reflective use of learning journals with the class so I decided to accept the pupils' journals as they were – a superficial record of their learning from the mindset mini-lessons, which would not necessarily provide me with the evidence I had anticipated. Although disappointing, this was the right thing to do for the pupils given the limited time available.

The Intervention

I began the work of changing the mindsets of pupils in the class by carrying out what I describe as the 'continuum activity'. This is based on a diagram which summarises Dweck's mindset, which I initially received during in-service training on mindsets. This diagram is included in Dweck, 2006 and can also be found online at the Stanford Alumni website. The idea of the continuum activity is to get the pupils to consider their approaches to challenges, obstacles, effort, criticism and the success of others. I placed a sign on each side of the room, one saying 'fixed mindset' and the other with 'growth mindset'. I asked the pupils to place themselves physically between these two signs to indicate their feelings for each statement, which led to a very fruitful discussion. Before this physical activity, I utilised another suggestion from my proposal feedback, where concern was raised about the pupils having to publicly position themselves. I agreed that this might influence

their choices so I first gave them the statements on paper. The paper version incorporated the same 'continuum' idea but now as a tick on a line. This method also had the advantage of providing written evidence of the pupils' thoughts, which could then be repeated and compared. I had intended to photograph the pupils carrying out this activity to record their positions, however this would have been impractical. Pausing to photograph would have interrupted the flow and pace of the activity, and the pupils were not keen on being photographed for my assignment. I concluded the session by asking the pupils to record any changes to their answers which had come about through discussion. Although the written aspect of this activity did ensure that pupils had considered their answers privately, and generated useful written answers, I did reflect in my learning journal that it had removed some of the fun from the activity. This entry from my journal also highlights the fact that I was already disappointed with the progress of the intervention. There was a lot less enthusiasm from the pupils and I had begun to look for explanations for this: "Am I talking to them too much about my project? Should I be explaining the real point more fully as I did last year?".

A simplified version of the physical continuum activity was repeated frequently throughout the intervention to encourage the pupils to consider their progress. In this quick version of the activity, pupils were asked to think if they were feeling very 'growth' or 'fixed' and place themselves in the relevant place in the room. This took place either at the start or the end of the lesson and often generated interesting results which will be discussed in section 3.

With the continuum activity complete, I then began the series of mini-lessons. I wanted to emulate the mindset workshop described by Dweck (2006) and decided to do this by modifying a resource produced by the Centre For Confidence and Well-Being (2009). Sections of this PowerPoint were used as a stimulus for discussion for approximately fifteen minutes at the beginning of each lesson over the course of three weeks. The pupils recorded their learning in group learning journals. It was

clear from discussions taking place during these mini-lessons that many of the pupils were interested in the ideas being explored and were keen to find out more. At times it was difficult to contain this learning to fifteen minutes and then return to our biology topic. This led me to consider on the 26th March: “Should I have done straight mindsets for 2 days?”. I was concerned that the interweaving of mindsets and biology was confusing the pupils, and although it was too late to undo this I began to consider a way of improving the situation.

In order to address the confusion described above, I decided to carry out a summary activity on mindsets with the class. Due to personal circumstances I had started the intervention later than intended. This meant that by the time I had completed the mini-lessons, we were interrupted by the Easter holidays. On our return, I set the class the task of producing posters on mindsets to help them to piece together the learning from the mini-lessons. This took the form of first imagining what life would be like if it could be lived with a growth mindset then cutting out pictures from magazines to represent this. The majority of the pupils engaged well with this task and I therefore allowed them the full hour to complete this. In the following lesson the pupils combined their magazine pictures with the ideas we had discussed regarding mindsets to produce posters.

In the remaining four lessons before the final observation we returned to our ‘normal’ biology lessons. We continued to use the continuum activity regularly to maintain the awareness of mindsets in the class. I also made an extra effort to encourage pupils to consider their approach to difficulties during these lessons in the context of their mindset.

Collecting Evaluative Data

In order to evaluate the impact of the intervention, it was necessary to repeat the data collection processes which had been carried out at the beginning. I arranged for the PT Pupil Support to return

and observe another Thinking Science lesson on correlation. This was arranged for the same time in the week as the first observation as I had noticed during the continuum activities that the pupils' mindset varied throughout the week. The majority tended to state they were 'fixed' on Monday and Wednesday and 'growth' on a Tuesday. I concluded this lesson with a slightly altered version of the "Do You" questionnaire. I amended the final question on this sheet to ask the pupils if they felt their responses had changed during the intervention.

The final task of the intervention was to repeat the interviews with the three pupils I had interviewed at the beginning. These were carried out in the same manner as I had done previously and proved even more difficult to avoid asking leading questions.

Section 3 – Critical Evaluation

I was aware from the outset that this intervention was always going to be a challenging one, both in terms of the objectives I was aiming to achieve, but also in terms of evaluating any impact. Evidencing pupils' confidence for learning is not an easy task. I therefore tried to include a number of different data sources in an attempt to triangulate any progress made.

Learning Journals

During the course of the intervention I attempted to keep a learning journal and tried to get the pupils to do so as well. Unfortunately, neither of these has been incredibly useful in terms of providing evidence for an increase in class confidence. Taking my own journal first, it is now apparent that I was mainly using this as a means of reflecting on the success, or otherwise, of the lessons from my own perspective. For example, on the 20th April following the poster task I reflected "Set class poster task. Engaged quite well with magazine task. All except CS and TM". In this case, as with many others, I feel that I am using my journal to "record experience" which Moon (1999) says "may approach the development of a log". Although this is a useful record of the experience, it does not provide much insight into the progress of the pupils towards the stated aims. Where I do provide some evidence of the pupils' progress is when I record their response to the continuum activity. On Tuesday 21st April I stated "Continuum Activity → a no. of movements from previous day! Much more in the middle, less at 'fixed'". This could be used to support the view that the pupils had begun to feel that they were developing a growth mindset. However, at the end of the intervention on Wednesday 6th May I wrote "Most pupils chose fixed for continuum activity". These notes record a phenomenon I noticed throughout the intervention, which was that the pupils' responses to the continuum activity varied with the lesson time. The majority of pupils felt that they had a fixed mindset on Mondays and Wednesdays, whereas they would say that they were growth on a Tuesday. The fact that the pupils were altering their responses at all is a positive outcome from the intervention. It at least shows that the pupils were engaging with the ideas

explored and able to consider their own feelings and attitudes, even if it had not yet actually changed their mindset.

The other learning journals employed in the intervention were the pupils'. As stated in section 2, these were completed on flipchart paper in groups in an attempt to help the pupils to discuss their thinking before having to commit to paper. Once again, I found it difficult to encourage the pupils to go beyond the simple recording of facts, and as a result there is very little evidence of their progress in these journals either. The one useful set of entries were made on Tuesday 28th April. On this occasion the pupils had worked extremely hard in class and completed all of the tasks very quickly indeed. I therefore had a little more time available to me and I was able to allow a greater discussion to take place following the continuum activity at the end of the lesson. There was so much time in fact that I was also able to ask the pupils to record their reasons for their choice of mindset on the learning journals. A few pupils stated that they had a growth mindset in the lesson because "the work was easy". This suggests that these pupils have not fully understood the nature of mindsets. However, some of the pupils were able to communicate more interesting reasons for their mindset:

SM: "I was at the growth side today because I didn't think I could do plants but in the end I could"

CR: "Growth mindset, I found answers in the paragraphs"

DD: "growth because I've found my tiny brain down down down somewhere!"

BS: "Fixed mindset because I'm stupid – I got angry!"

These responses demonstrate that these pupils have begun to understand what having a growth mindset involves and articulate this in writing. CR was particularly proud during this discussion as she would normally ask me for help when stuck, but on this occasion she had the confidence to persevere and find the answer for herself. DD's response is also incredibly interesting. The fact that she describes her brain as being "tiny" and implies that it was lost in some way indicates low self-

esteem. As Lawrence (2006) points out “the child with low self-esteem...will lack confidence in his/her ability to succeed.” The fact that DD is stating she had a growth mindset in the lesson due to the fact she had “found” her brain suggests an increase in her self-esteem, and consequently her confidence. This therefore supports Dweck’s (2006) claim that learning about mindsets can change people’s mindsets and raise their confidence for learning.

Questionnaires

The first questionnaire I gave to the pupils was at the end of the first observation lesson. Due to time constraints, this questionnaire was not repeated at the end of the intervention. As explained in section 2, the continuum line approach for these questionnaires was designed to encourage the pupils to think freely about their responses and to avoid constraining them with limiting boxes. These responses however are clearly not ideal for data analysis. In order to address this I also printed a copy of the questionnaire onto acetate and divided each of the horizontal lines into ten segments. This then allowed me to categorise the pupils’ responses on a scale of 1 to 10. For each question, a score of 1 would imply a fixed mindset and low confidence for learning, whereas 10 would be the opposite – a growth mindset. Although this questionnaire is of limited use when evaluating the impact of the intervention, as it was not repeated at the end, it is still useful as it indicates the mindset of the pupils at the outset. When asked if they expected to enjoy the lesson, the average score was 7.4. By the end of the lesson the pupils had changed their minds responding with a score of 9.0 when asked if the activities were actually boring or fun. There was also an increase, although a much smaller one, when asked about difficulty. The average score beforehand was 8.2 when asked if they would be good at the activities, which rose to 8.4 when asked if the activities had proved to be hard or easy. These increases suggest that the pupils do not anticipate a challenging learning situation will be as positive an experience as it turns out to be and underestimate their ability to complete the tasks set. It is however necessary to draw these conclusions with caution as these averages are heavily influenced by the responses of a small

number of respondents, given the very small sample size of fourteen. In addition, I suspect that some of the pupils did not take this questionnaire as seriously as I had hoped, such as DD, SB and BS who scored 10 for every answer. These pupils all sit at the same table and may have influenced each other's responses. Perhaps it would have been better to have asked the pupils to complete these when they were separate, for example when they are in different classes, to reduce the influence of their peers.

I also used the "Do You" questionnaire in the intervention. This questionnaire was completed at the beginning and end of the intervention with one small alteration between the two – a change in the comments box at the end. I carried out a similar exercise as described above to convert the pupils' responses on the continuum lines into a ten-point scale. Looking at the averages first of all, it is interesting to note that the overall average rose from 6.6 to 7.2 between the beginning and the end of the intervention, possibly suggesting that the class as a whole did indeed develop more of a growth mindset. This is a product of the average score for four of the five questions increasing between the two questionnaires. The only question to have lowered in value was the second: "If you hit an obstacle, do you give up easily or keep trying?", this lowered from 7.2 to 7.1. The two questions which showed the greatest increase were "Do you see making an effort as a waste of time, or the way to improve?" and "If you are criticised, do you ignore it or learn from it?", both of which increased by a margin of 1.1. This suggests that the pupils were making progress in their awareness of the value of effort and criticism, but were still struggling to put this awareness into practice by persevering when presented with an obstacle.

Moving onto the individual responses, of the fourteen who completed both "Do You" questionnaires, eight of the pupils displayed an increased score overall and six decreased. Interestingly three of the eight pupils whose scores increased overall claimed in the final comments box that their mindset had not changed (MF, RG & JO). Likewise, three of the pupils claimed that

their mindsets had become more growth, even though their scores suggested otherwise (LT, TM & BC). This calls into question the validity of this questionnaire. Why are there such discrepancies between the pupils' own answers? Perhaps the pupils were not taking the questionnaires seriously? Or, perhaps the pupils' literacy levels were limiting their responses? I could have addressed the latter question by checking the reading age of the questionnaires and checking this with the pupils' reading ages before using them.

Interviews

As outlined in section 2, I interviewed three pupils before and after the intervention in order to “collect detailed qualitative data expressed in the respondent's own words” (Burton & Bartlett, 2005). These recordings have been edited to remove the names of the respondents. The pupils chosen for interviews had all displayed low levels of confidence in class: CS, DS and SM. Both CS and DS are pupils who have consistent behavioural problems in class and give up easily when presented with challenges. SM is different in that she does not present the same disruptive behaviour, but openly states that she is “no good” at certain things. As these pupils so clearly manifested the signs of a fixed mindset, I had hoped that they would benefit from the intervention most and would be able to evidence progression. As the recordings demonstrate, the interviews proved to be quite difficult – particularly those at the end of the intervention. DS proved to be the most challenging to interview. He was unwilling to answer the questions fully and as a result I found myself ‘leading’ him much of the time. CS was surprisingly forthcoming in the initial interview and was able to discuss his behavioural difficulties in a fairly mature manner. Unfortunately, in the second interview he claimed that although his behaviour had improved recently this was not due to the mindset intervention. Frustratingly, this contradicts his response to the second “Do You” questionnaire where he stated that his mindset had changed “because it made me feel better about myself.” CS's attitude and behaviour in class can vary from day to day, and I feel that he was not in the same open frame of mind on the day we conducted the second interview

as he had been at the beginning. It is therefore very difficult to evaluate the impact of this intervention on him with any certainty from this interview. SM's interviews on the other hand demonstrate both the greatest awareness and progress. She eventually admitted in the second interview that she was now more aware of her mindset in different classes, even if she was as yet unable to alter her mindset. This is clear progress as it shows that she has developed the ability to reflect on her own approach to learning. Dweck (2006) points out that Howard Gardner described exceptional individuals as having "a special talent for identifying their own strengths and weaknesses" and she goes on to state that "those with the growth mindset seem to have this talent." So, perhaps SM has taken a significant step towards having this insight, even if she has not yet been able to make any significant changes. Again, however, SM contradicts herself in this interview with her response to the second "Do You" questionnaire, which was completed the previous afternoon. In the questionnaire she responded to the open question at the end with "Yes I have changed my mindset because before I gave up easily, now I don't I give things a try even if it's hard". This once again calls into question the validity of the pupils' own responses to both the questionnaires and the interviews. Perhaps the pupils were finding it difficult to really reflect on their own mindset. What then would our independent observer conclude?

Observations

As described in section 2, I carried out two observed lessons with the class with the intention of viewing the behaviour of the pupils when presented with challenging concepts. The lessons were observed by the school's PT Pupil Support. I was extremely fortunate to be able to have this colleague to observe the class on both occasions, not only to ensure continuity between the two sets of observations, but also as this member of staff is extremely knowledgeable of the pupils concerned and the theories underpinning this intervention. As a result, the observation notes are extremely detailed and provide an indication of the progress for each of the pupils in the class, as well as an overall perspective. Interestingly, the notes from the observations do display an overlap

with the conclusions drawn from the other sources of evidence. As with the questionnaires, there is an overall improvement in the class with lots of intricate and contradicting progression within that. According to the observation lessons, the pupils who display the greatest improvement across the intervention are CR, DD, BC and SM. The rest of the class have either made some progress, mainly in terms of their understanding of their own mindset (NM, NF, DS, JO, RG, HC, TM) or have remained fixed and lacking in confidence (CS, DH, MF, MC). Many of these outcomes have already been described above, such as CR's and DD's responses in the Learning Journals and "Do You" questionnaires and CS's response in the second interview. Surprisingly, the observation provides further, quite convincing, evidence that SM has been able to develop a growth mindset and raise her confidence; so why did she not say this in the interview? I am left to conclude that the interview structure was not as effective as it could have been given that SM seems to have progressed significantly according to the learning journal, questionnaire and observation but not the interview. Possible alterations to address this could involve holding the interview somewhere away from my classroom, or even asking someone else to conduct the interviews.

All of the evidence gathered suggests a similar outcome from the intervention – some pupils have made significant progress, others less so and some not at all. Although the intervention was relatively short in nature it is still surprising that some pupils seemed to make no progress towards raising their confidence for learning through altering their view of their own ability and intelligence. Dweck (2006) implies that we all are either fixed or growth in our view of mindset and this is what influences children's view of themselves and their approach to learning. The findings of this intervention could suggest that the answers are more complex than this. Some children's success at school may be limited by having a fixed mindset and for some of these children it may be possible to help them to change their mindset and raise their confidence for learning. However, for some children their lack of confidence in school could have other explanations which learning about mindsets cannot address. There may even be other pupils' who do have a fixed mindset, but no

amount of learning about mindsets could help them to shift this mindset and raise their confidence. Perhaps these pupils require much more sophisticated help to alter their view of themselves to the point where it impacts their behaviour. As suggested by the PT Pupil Support, this help may need to happen earlier than S2, prior to puberty and before the challenges presented by secondary school get the better of these pupils. I noted this myself on the 16th March when I reflected on the progress of the intervention as compared to the pilot I carried out with an S1 class last year: “Certainly not working as well as it did with 1K last year”. Lawrence (2006) provides a detailed analysis of self-esteem, its impact on children and various strategies for raising self-esteem. It would be interesting to try these strategies with those pupils who did not improve through this intervention to see if it is possible to find a way to help them to raise their self-esteem and consequently their confidence.

Section 4 – Learning & Next Steps

Carrying out this intervention has been an enormous learning experience. My understanding of the possible use of mindsets to raise the self-esteem and confidence of pupils has obviously been enhanced as already outlined in the previous sections. In addition, I have learnt a significant amount about the process of carrying out a piece of professional enquiry. This has been partly through reading relevant literature, however trial and error has played a significant part also. The most obvious example of this learning concerns the use of learning journals. Despite the fact that I have often struggled to keep a reflective learning journal myself, for some reason I assumed that the pupils would be able to do this after a short introduction to the idea. It became clear to me that it is not possible to expect pupils to be able to keep learning journals without a significant amount of time and effort invested into working on this skill – this could in fact be an entire intervention in itself. This process has also displayed the effectiveness of my own learning journal. Although I have made some progress in that I do occasionally make the time to reflect on lessons, I still need to devote more time and thought to this to make these reflections ‘deeper’.

This intervention has also caused me to question the appropriateness of attempting to change pupils’ mindsets in their biology lessons. Many of the problems which arose during the intervention did so as a result of me trying to combine the mindsets lessons with the biology course. There simply was not sufficient time available to do everything I wanted to do for the intervention due to the pressure of getting through the course content at the same time. The work on mindsets is clearly beneficial for many pupils, as shown by the evidence collected for this assignment. However, perhaps the reality is that this learning needs to take place elsewhere in the curriculum, for example in Social Education. For future interventions I need to consider the time constraints of the lessons more fully to ensure that it is possible to achieve all that is planned.

My understanding of the usefulness of various forms of data collection has also progressed as a result of this intervention. As already stated, I would consider where and how I carried out interviews with pupils more fully in future. I had not considered the possibility of holding these in a 'neutral' room before and would probably do this next time. Unfortunately, it would be very difficult to find someone else to hold these interviews but I do feel that this would be much more objective. The questionnaires employed on this intervention also supplied a learning opportunity. Although I am proud of the 'continuum line' approach I used in the questionnaires, I had not planned how I would analyse them when I produced and issued them. The ten-point scale worked well, but I should really have thought the use of the questionnaires through when I designed them. I should also have included a greater consideration of the reading age of the pupils in the class. I did make an effort to write the questions in such a way as to allow the pupils to understand them, but I could have approached this much more methodically and carried out a proper check of the reading age of the language used. Finally, the use of observations in evaluating this sort of intervention proved to be much more valuable than I had initially anticipated. Upon reflection, it now seems obvious that the pupils would find it difficult to express their own thoughts on their own mindset, self-esteem and confidence and that observations of their behaviour would provide the most reliable indicator of their progress. Perhaps it was naïve of me to think otherwise, but I do not regret giving the pupils the opportunity to express their own thoughts, as this in itself will have provided a learning experience for them.

The next steps for this intervention are not yet fully clear. I intend to reinforce the growth mindset ideas which have proved effective for a number of the pupils in the class. I still occasionally carry out the continuum activity and intend to do so throughout the course. I am also interested in attempting some of the ideas from Lawrence (2006), such as trust activities or circle time, particularly with those pupils who do not seem to have progressed a great deal through this intervention. Due to the time constraints this intervention posed, I am also interested in exploring

ways of raising the confidence of pupils through the delivery of the course material. Claxton's (2008) wide-ranging analysis of education points to the fact that Dweck's work on mindsets is interlinked with the principles espoused by a Curriculum for Excellence. I am therefore considering the possibility of developing biology courses in line with Curriculum for Excellence which are designed to encourage pupils to adopt a growth mindset and raise their confidence for learning – thereby avoiding the difficulty presented by trying to “teach” mindsets as a stand-alone entity running alongside “normal” biology lessons. It would be much more sustainable to “teach” biology in a way which encourages a growth mindset. This idea is clearly still at an early stage and will require much more thought before implementation.

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