

How does the use of lollipop sticks as an AFL strategy affect the level of engagement in primary school pupils?

Student number: 1903157

Pathway: PGCE Primary with QTS

Targets from previous assignment:

	Target	What I have done in this assignment...
Target 1	Develop your ability to investigate contradictory evidence to help build a persuasive argument.	I have included works with opposing viewpoints to show criticality.
Target 2	Ensure a consistent academic tone throughout.	I have attempted to maintain an academic tone throughout my work by: • by using third person voice when discussing literature, in order to maintain neutrality; • Ensuring that I use education terminology and maintain a formal tone.

In *Successful Futures*, Professor Graham Donaldson states that the new curriculum for Wales should be “evidence-based: drawing on the best of existing practice within Wales and from elsewhere, and on sound research” (2015, p. 14).

In deciding on a research topic, the issue that interested me involved pupil engagement in relation to classroom questioning. In my class, I had observed that there were some children who were able to disengage from a lesson by not putting their hands up to answer questions. Often, there was a minority of pupils who would raise their hands to answer questions. As such, I was particularly interested in the effect that a questioning technique has on the level of engagement in the classroom.

Furthermore, quality of questions is a key element of assessment for learning (AFL). The emphasis on AFL is clear in Donaldson’s review, which states, “Good teaching and learning means employing assessment for learning principles” (2015, p. 67). He describes that such an approach provides teachers with evidence of pupil learning, which is then used to inform teaching practice. In relation to questioning, this lies in being able to assess pupil learning based on the responses that they give.

I discussed this issue with my research partner, and we felt that the vastly different classroom contexts would allow us to collect evidence of the differences in the level of engagement in different age groups. I was placed in a reception class consisting of 25 pupils, while my research partner was placed in a Year 6 class of 27 pupils. One of the areas we could analyse, therefore, is whether a specific device is more or less effective in one age group compared to the other.

My research partner and I settled on using the lollipop stick strategy as the questioning device, as we knew that the students in reception class were familiar with it. Prior to the beginning the project, we knew that the Year 6 classroom teacher did not use the lollipop stick method, but did use an electronic name generator to randomly choose names. We settle on a research question of, ‘How does the use of lollipop sticks as an AFL strategy affect the level of engagement in primary school pupils?’

Wiliam and Black (1998) identified AFL as the major means of raising standards for all pupils. As I have already stated, quality of questioning is a key element of AFL, as questioning can provide teachers with the information about a pupil’s learning which they can then use to adapt their teaching and meet the pupil’s needs. That being said, Wiliam and Leahy describe the issue with a ‘hands-up’ approach to questioning:

But if the aim of questioning is to help the teacher find out what the students know, it makes little sense to select a respondent from the volunteers, because generally, students raise their hands only when they are confident they have the correct answer...Instead, if the teacher is asking the question, it should be the teacher who selects the student or students to respond, ideally, at random. (2015, p. 65)

This puts the emphasis on encouraging *all* pupils to take part in classroom questioning and discussion. This supported our research question, as the overarching aim of random questioning is to increase student engagement. Of course, in order to assess the effect of the device on our case pupils, we needed to ensure that we chose their sticks. As such, we marked the top of their lollipop sticks with a small coloured mark. This meant that we were able to decide when to choose a stick of one of the participants, but it retained the randomness insofar as that we were not sure which of the 3 pupils we were choosing.

However, critics of random questioning say that the role of the teacher is to match the right student to the right question. Didau has stated, "I'm not a fan of randomisers; the power to select who answers our questions should be treasured" (2013, <https://learningspy.co.uk/leadership/model-lesson-part-1/>). For Didau, effective questioning comes from knowing your pupils well, and ensuring that they have the tools to be able to answer the question. Bennett (2013), agrees with this thought. He describes how targeted questioning can be utilised for specific purposes: to create a classroom environment of success and praise, where the teacher can match questions to the student's ability; to demonstrate exemplar answers from pupils; to make a pupil realise they are not participating fully; or to "make an overconfident kid realise he doesn't have all the answers" (2013, <https://www.tes.com/news/blog/lollipop-stick-gate-you-can-take-away-my-life-youll-never-take-my-wee-wooden-randomisers/>).

However, this targeted question may embed low expectations. Fletcher-Wood describes how,

'Weak' students never cease to surprise me with brilliant answers to hard questions, because they get the chance to answer. Equally, asking 'simpler' questions to 'smarter' students offers the chance to hear good answers modelled or, on occasion, highlights surprising gaps in their knowledge. (2014, <https://improvingteaching.co.uk/2014/05/17/why-do-i-rely-on-lollipop-sticks/>)

Therefore, by not giving *all* pupils the opportunity to answer *any* type of question, you are not fully seeing their level of understanding.

The questioning tool in our research project, lollipop sticks, has been employed by many teachers over recent years, and is now seen as a staple in many classrooms. It entails each pupil in a class having their name written on a lollipop stick, which are then drawn at random when asking a question, in a bid to ensure that all pupils can contribute to classroom discussion, thereby increasing student engagement. However, Didau has expressed the dangers of falling for lollipop sticks as a classroom tool, along with other strategies, calling them, “trendy trappings of apparent ‘best practice’” (2016, p. 38). He questions what effect they actually have on pupils’ learning, and expresses concerns that practitioners are content to see evidence to support the belief that such strategies work. Whereas if they do not see the evidence, they do not then question the strategy, but rather make excuses for why it did not work. Thus, in carrying out a research project, we would have the chance to assess their effectiveness, or whether they are just a fad.

Research in a school setting requires that any ethical considerations be addressed. When planning our research project, my partner and I analysed the potential risks to the participants, ourselves as the investigators, and the university. We explored the ways by which we could limit these risks. To help us in this, we referred to guidance materials such as the BERA Ethical Guidelines for Education Research, the UWTSD Research Ethics & Integrity Code of Practice, and the UWTSD Research Data Management Policy. We then addressed these risks in our Ethics Form, which was approved by the Ethics Committee.

Throughout the project, we ensured that we gained the consent and retained the assent of the participants, and took steps to limit the risk of emotional distress. We also ensured that any transfer of data was completed securely, so as to retain the anonymity of the participants. In keeping with this, the names of the school and any teachers or pupils will remain confidential throughout this paper. Finally, we sought to ensure the personal safety of ourselves, and to complete the project while upholding the good name of the university.

When it came to planning our research project, we followed Dudley’s model of lesson study which involves:

teachers collaboratively planning, teaching, observing and analysing learning and teaching in ‘research lessons’. They record their findings.

Over a cycle of research lessons they may innovate or refine a pedagogical approach which will be shared with others (2011, p. 2)

Together, we planned the starters of the lessons (see Appendix 1), in which the action research was to take place. We completed two research lessons - the first in a reception class, where I was the teacher and my partner was the observing researcher, and the second in a Year 6 class, where our roles were reversed. In each class, we chose three case pupils. These students were chosen as a representative sample of higher, middle and lower ability pupils across the curriculum. Following the first lesson, we conducted a focus group interview, before reflecting on the lesson study. The data and information that we collected then informed the way that we refined the teaching strategy for the second research lesson. Again, we held a group interview following this lesson and reflected on it together. This allowed us to evaluate and draw conclusions about the strategy, which I will discuss later in this paper.

The methods of data collection we used in this research project included non-participant observation, focus group interviews, and reflections on the lesson studies. Our observation schedule was semi-structured in that we were observing with the intention of measuring engagement on a scale, but we also collected qualitative data through note taking. The scale that we used was devised by the Flemish educationalist Ferre Laevers. He devised two five-point scales to assess involvement and well-being in pupils, two factors that he perceived to be essential to ensure deep-level learning. He defines involvement as “(a signal of) how children are concentrated, absorbed and fascinated, how they are engaged in activities and operating at the very limits of their capabilities” (Laevers and Declercq, 2018, p. 327).

Therefore, we identified the Leuven Involvement Scale as an effective tool to measure the engagement level of the pupils in our lesson studies. The observing researcher marked the level of the three case pupils on the scale from 1 to 5, at intervals of 3 minutes throughout the starter. The 3 minute intervals allowed for a starter that lasted around 10 minutes, and also allowed for observations and notes to be made to accompany the scale. These notes were of a narrative and descriptive nature in which we sought to answer questions such as: ‘is the pupil looking at the teacher? What is the pupil’s reaction to being chosen to answer? How quick are they to answer the question? (I.e. were they prepared to answer?)’ We found that this semi-structured method of observation gave us some measurable data, from the scale. However this data was based on observation, which is still open to observer bias. Therefore the accompanying descriptive notes served as further markers of engagement, in order to allow us to accurately assess the pupils’ engagement.

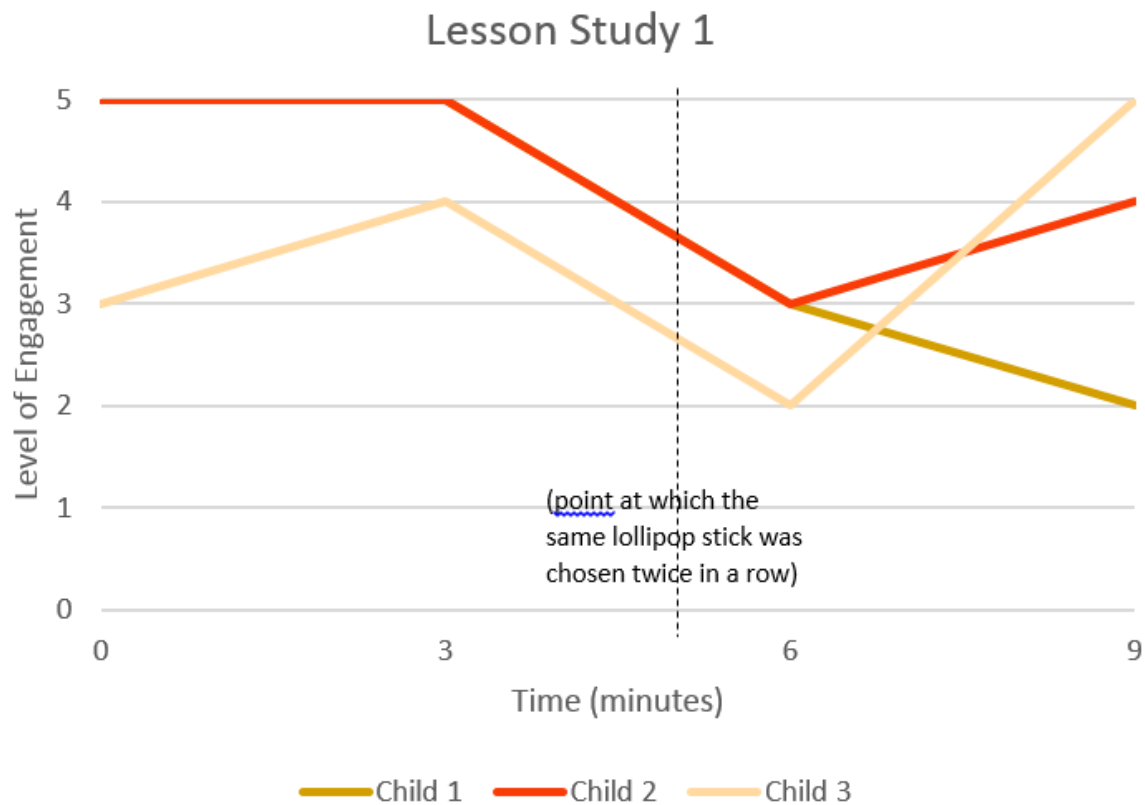
Interviews are an integral part of the lesson study process, in order to engage pupil voice. The pupils themselves have a role in a study which, ultimately, aims to have a positive impact on their own learning. Immediately after the lessons, we conducted group interviews with the three case pupils. We used a semi-structured method of focus group interviews to allow us to alter the questions to fit the level of understanding of the pupils, and to allow for an informal setting to encourage free discussion. Following the advice of Dudley (2011), the interviews took place directly after the observed lessons, so that the pupils' memories and reflections of the lesson were as fresh as possible. These interviews took place outside of the classroom, in a room known as a 'cwtch', which is a comfortable, quiet room familiar to the children. This was to ensure a relaxed atmosphere, in which the students felt at ease. In planning the interview stage, we devised nine questions which were a mixture of closed and open-ended questions (see Appendix 2). This strategy allowed us to collect specific responses, but also encouraged discussion and respondent-driven answers (Cohen et al., 2011). Furthermore, both I and my research partner felt that we had established a positive rapport with both sets of pupils during our time at the school, which encouraged trust and truthful responses in the interviews.

During the interview stage, we reiterated to the case pupils their role in the research project. We ensured that we had their verbal assent and made them aware that they could leave the interview at any point, through the use of a 'smiley face' system, which the participant would turn to a 'sad face' if they wanted to leave the interview. In both interviews, however, no pupils ended their participation, and we were able to collect responses from all.

Following the interviews, reflections on the lesson studies were captured following Gibbs' Reflective Model (1988) (see Appendix 3). We chose this model as it is well-structured, and provides cue questions which guide the reflection process. It builds on Kolb's Experiential Learning Cycle because it involves feeling and thoughts. This is an important element of reflection as it allows the researcher to make sense of an experience, and to express their emotional responses. Furthermore, my research partner had used this model in previous research, and felt it suited our needs in this research.

The first research lesson took place in a reception class with pupils aged 4 and 5 years old. The way the lollipop stick strategy was applied was by choosing a lollipop stick, and putting it back into the pot immediately. I asked the question, and then chose the stick, which would give the children a chance to think of an answer first. On one occasion where I asked the same question to several different pupils, I chose the same stick twice in a row. The students found this amusing, which led to disruption and the disengagement of several

pupils, including Child 1, from the starter. This serves to highlight one of the flaws of replacing the stick, in that it is possible that the same child could be called upon repeatedly to answer a question. A simple mistake which can have serious effects on pupil engagement.



Child 1 was initially very engaged in the questioning. The observer marked him at level 5 for the first two intervals, and the accompanying notes detail the outward markers of engagement (see Appendices 4 and 5). However, as can be seen in the diagram above, following the incident, his engagement level declined and the observer noted that he remained distracted for the rest of the starter.

Similarly to Child 1, at the beginning of the session, Child 2 was paying attention to the teacher, and reacted positively to her stick being chosen. Again, following the incident, the level of Child 2 decreased. At 9 minutes, the observer stated that Child 2 became more engaged, and marked a level 4. However, the response she provided was the same as one just given by a peer. Therefore, the observer questioned what her true level of engagement was, as it may be that she was not paying attention to the discussion in the class, which led her to give the same response, or it could be that she simply had the same answer and wanted to share that with the class. Another explanation, could be that the wording of the question was not adequate and she did not know that she should give a *different* answer.

Child 3 began the starter with a low level of engagement, and the level continued to vary. At 6 minutes, Child 3 is not engaged, as the notes state that he was not ready to answer his question. His physical markers also implied lack of engagement as he shrugged or nodded, rather than speaking and he required a lot of prompts to answer the question. For the final question, which involved talking in learning partners, Child 3 had the highest level of the case pupils, as he was very engaged during the talking with learning partners, and when his name was chosen to give an answer, he showed confidence in answering. It could be concluded, therefore, that for Child 3, pairing the lollipop stick questioning device with another strategy, that of talking partners, gave him more confidence to share his answer.

In the interview, Child 1 expressed a preference for a hands-up approach to questioning, stating that, "sometimes I feel so sad when I know the answer but my lollipop stick isn't chosen" (see Appendix 6). This could further explain his disengagement. Furthermore, when asked if they liked using lollipop sticks, Child 1 described enjoying being the one to choose the stick in the role of 'Helpwr Heddiw'. This could suggest that Child 1 likes to have some control over his participation.

Child 2 stated no preference between a hands-up approach and a lollipop stick strategy. She did comment that the randomness of the strategy is fun, and that sometimes she likes to answer questions in class.

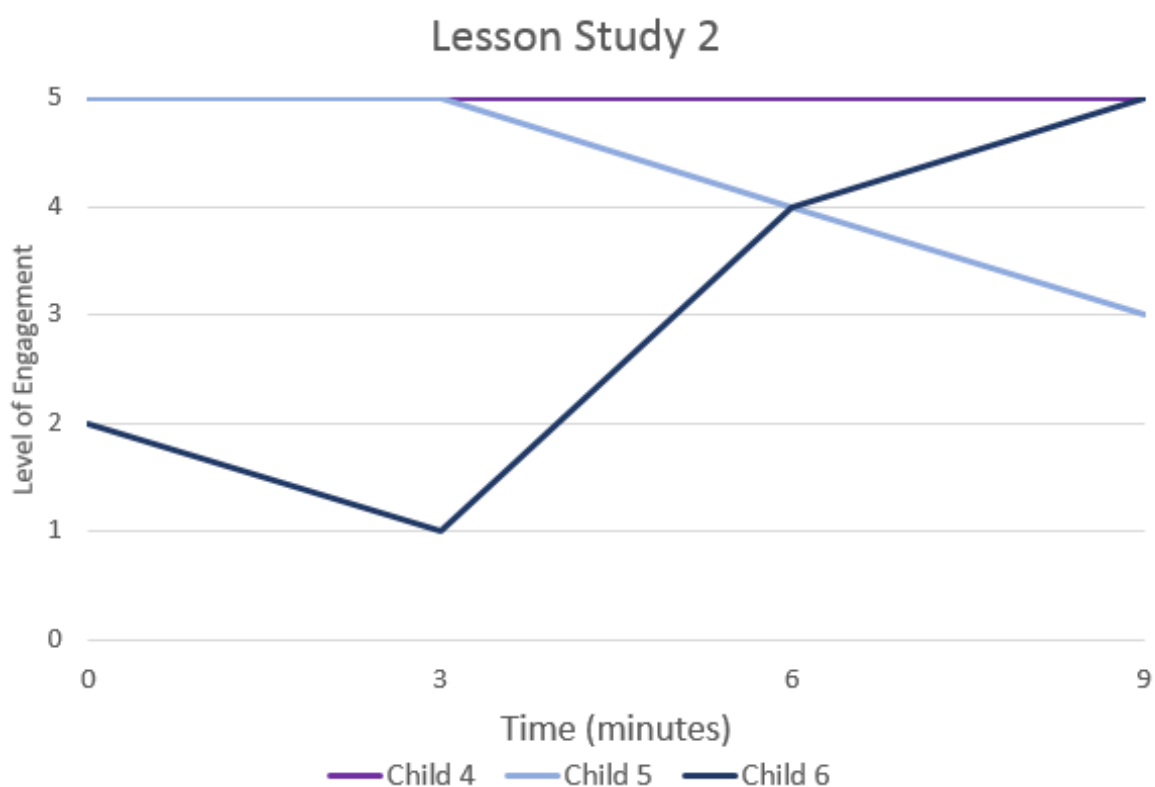
During the lesson, Child 3 had two contrasting experiences of the lollipop stick. On the first occasion, he was not ready to give a response and required help to answer the question. The second time, I asked the children to talk with their learning partner prior to choosing a lollipop stick, following which Child 3 was able to answer confidently and promptly. During the interview, however, Child 3 was the only pupil to state a preference for the lollipop sticks strategy. It could be that because the more positive experience occurred at the end of the starter, this was most fresh in his memory and so he had a positive view of the strategy. That being said, when asked in the interview how they feel when their stick is chosen, Child 3 stated, "I didn't know what to say but I just said I don't know and it doesn't matter", which would imply that the first experience did not have a detrimental effect on his opinion of questioning.

It is difficult to measure the effect of the strategy in pupils of this age, as so many things can affect their level of engagement. Both my research partner and I agreed that there was a lot of distraction, possibly due to the age of the pupils and the disruption from children going to read with a parent volunteer.

During our reflections of the lesson (see Appendix 7), we decided to modify the strategy for the next research lesson by leaving the lollipop stick out of the pot each time, and making

sure that the pupils were aware of this. This would allow us to test whether pupils would remain engaged despite knowing that there was no possibility of being called upon to answer a question.

The second research lesson took place in a Year 6 class with pupils aged 10 and 11 years old. The way that we decided to employ the lollipop stick strategy was to pick a lollipop stick, and leave it out of the pot, clearly putting it down on the table for the children to see. At certain intervals, the teacher returned all the sticks to the pot, and announced this to the class so that they would know when their name may be called out again. Prior to carrying out the research, we were not sure if the Year 6 participants would have been exposed to lollipop sticks as a questioning device in the past. We knew that their current classroom teacher used a computer name randomizer, and therefore we did not know if the novelty of the lollipop sticks would prove a distraction. However, during the interview, all three children remembered some of their past teachers having used lollipop sticks, and therefore they were familiar with the concept.



Child 4, as observed by both researchers, was engaged throughout the whole of the starter. At each time interval, he was marked as a level 5 on the involvement scale (see Appendix 8), and he showed other markers of engagement, such as looking at and listening to the teacher; reading along in the book; giving prompt and extended responses when

questioned; and reacting to his peers' responses by putting his own hand in a bid to add to their responses (see Appendix 9). It is important to note that Child 4 is a higher ability pupil, and is often engaged in the lesson, so his high levels of engagement may not have been a direct result of the lollipop stick strategy.

Similarly to Child 4, Child 5 was initially engaged in the starter, and was marked as a level 5 for the first two time intervals. Child 5 attempted to answer questions by putting her hand up, at which point she was reminded by the teacher that it was 'no hands-up'. Following this, her level of engagement steadily declined for the remainder of the starter. The observer questioned whether this was due to a loss of motivation because she was not being chosen to share her answer when she raised her hand. This is echoed in her responses during the interview, where she stated that, "answering gives you a chance to show what you know" (see Appendix 10). However, despite her lower level on the involvement scale, Child 5 promptly answered the question she was asked at the 9 minute interval, so perhaps her outward signals did not accurately reflect her level of engagement.

Initially, Child 6 was not engaged in the starter, as she was not ready to answer the question when her lollipop stick was chosen. However, immediately following this, her engagement improved hugely, as can be seen in the diagram above. The observer noted that she was listening to her peers answering and the teacher talking. Perhaps she realised that her stick had been replaced and she might be called upon again to answer. It could be that she felt embarrassed that she was unprepared to answer and wanted to avoid a repeat of this. However, during the interview, when asked how she felt when her stick is chosen, Child 6 expressed that, "I don't mind because even if I don't always know the answer, it doesn't matter it's just about trying".

In the interview, all three case pupils expressed a preference for lollipop sticks over the computer randomizer that their classroom teacher uses, describing that the lollipop sticks gave everyone a fair chance of being questioned, since the teacher left the stick out each time.

When asked whether the lollipop sticks makes him pay more attention to the questions, Child 4 stated that, "sometimes if my name has already been chosen, I know it won't be again so then I still can become distracted". This was not reflected in the data, however, as he retained a level 5 on the involvement scale throughout the whole of the starter.

As with the first lesson study, during the reflection stage (see Appendix 11) there were some points that were highlighted. Specifically, the question of pairing the lollipop stick strategy with other AFL strategies. Child 4 and Child 6 expressed the importance of increased think time during questioning, and Child 4 also suggested pairing it with group discussion or

talking partners, the latter having been highlighted in the first lesson study. Therefore, we would seek to address these points in future research.

In each lesson study, the lowest ability pupils (Child 3, and Child 6) were the only participants whose level of engagement increased. Three of the remaining four participants saw their levels of engagement decrease from the beginning of the starter compared to the end. As Wiliam and Leahy describe, one explanation of this could be that higher-ability students can feel excluded when they are not allowed to show that they know the answer (2015, p. 67). In fact, Child 5, a medium ability pupil, echoed this notion in the interview when asked how she would feel if she knew the answer but her lollipop stick is not chosen and she answered, "I sometimes feel disheartened because I like to show the teacher that I know" (see Appendix 10). We observed her level of engagement drop after being reminded of the 'no hands-up' rule, perhaps due to her not being able to participate in the way that she wanted. To combat this, Wiliam and Leahy suggest allowing volunteers to contribute responses, but only after the random questioning has taken place.

In the case of Child 3, his level of engagement increased following discussion in learning partners. Therefore it may be that he felt more capable and more confident to participate in the questioning, because he was not volunteering solely his own work, but rather his work with a partner. This leads to the question, would pairing random questioning with another AFL strategy, such as think-pair-share, increase engagement further?

We saw an increase in the level of engagement of Child 6 following her lollipop stick being chosen, despite there being no possibility of her name being chosen again. This possibly goes against the common thought that pupils may 'switch off' if the threat of being called upon to answer is removed. In fact, following the intervention, her engagement level greatly improved and remained high.

Furthermore, as previously stated, both Child 3 and Child 6 expressed that not knowing the answer did not matter. This could be a result of the school's embedded culture of growth mindset, where children are encouraged to 'have a go'. Hattie highlights the importance of having such a classroom culture which fosters an atmosphere of trust:

"Expert teachers create classroom climates that welcome admission of errors; they achieve this by developing a climate of trust between teacher and student, and between student and student. It is a climate in which error is welcomed, in which student questioning is high, in which engagement is the norm," (2012, p. 26)

When comparing lesson studies, my research partner and I agree that the engagement levels of the Year 6 pupils were affected by the device more positively than the levels of the reception pupils. This could be because they had a better understanding of the concept of random questioning, which could be due to their age, or a result of their previous experience of lollipop sticks in questioning. We also agreed that the greatest impact on engagement was seen in the lower ability pupils, and this is supported by the data we collected.

When reflecting on the way that my research partner and I carried out this research project, there are many lessons to be taken away from it. Firstly, we did not pilot the methods of observation and data collection, although it should be noted that I have a good grounding of understanding of the Leuven Scale, as I have undertaken a lot of reading about the model for my previous papers. However, due to not having piloted the methods, there may have been inconsistencies in the way that data was collected. As Cohen et al. state, “qualitative data analysis...is often heavy on interpretation, and one has to note that there are frequently multiple interpretations to be made of qualitative data” (2011, p. 537). In the future, therefore, I would consider having a member of the research team whose sole role would be to observe the lessons. In this way, there would be greater consistency in the way that the data was collected, which would improve the reliability of the results.

I am of the opinion that lollipop sticks are an effective tool for questioning, based on the results of this research project, and my observations of their use in my previous placements. Therefore, I would be confident that using them would enhance the learning of my pupils in my future practice. However, I would also be aware of the risks, particularly to higher-ability pupils. As Wiliam and Leahy (2015) state, students who like to raise their hands often dislike random questioning because they cannot show that they know the answer, however they come to recognize the benefits and grow to accept the strategy.

In the future, I would look to develop our research by evaluating not only the effect that a questioning technique has on the level of engagement, but also, the quality of talk in the lesson. Wiliam and Black highlight the benefits of an interactive method of teaching: “what is needed is a classroom culture of questioning and deep thinking, in which pupils learn from shared discussions with teachers and peers” (1998, p.9)

In the future, when I complete more lesson study research, I would aim to carry out the research over a longer period of time, with more research lessons within the same classes, in order to gather more evidence and data. This would allow my results and conclusions to be as reliable as possible, which is vital in such a profession which relies on effective

practice and leadership.

This approach of carrying out lesson studies can be invaluable for continued professional development and sharing good practice. This is highlighted in the new Professional Standards for Teaching and Leadership, which describes an effective teacher as a professional learner who commits to “continuous engagement in career long development, collaboration and innovation”. The standards also detail the importance of being a reflective practitioner who “consistently extends knowledge, skills and understanding and can show how reflection and openness to challenge and support informs professional learning to progressively develop pedagogy” (WAG, 2019)

This research project has allowed me to develop my skills in education research. I have had experience of designing a research project, critically analysing education literature in relation to my project, and evaluating the results from my own project with respects to existing literature. Going forward, I have a better understanding of the benefits of collaborative reflection, as often, a second person brings their own thoughts, opinions and suggestions which can help me to improve my own practice. Above all, I have gained greater understanding of the importance of observations and critical reflection in professional development and improving teaching practice. Such skills will serve me well as I move forward in my career.

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