

ECAD7004: Professional and Pedagogic Studies: Researching the Learning: what, how and why am I teaching?

Design, conduct and critically evaluate a close-to-practice research project (lesson study) focusing on the model of the transformative teacher in developing practice that has a positive impact on the learner.

Introduction

The Welsh Government published a document in 2010 which depicted a range of assessment for learning (AfL) strategies (Welsh Government, 2010). AfL is a higher-order theme of formative assessment methods (Black & Wiliam, 1998; Gardner, 2012) which can improve things such as the quality of questions/discourse, peer/self-assessment and feedback (Welsh Government, 2010). One AfL strategy is *random partners/random learner to answer question* (Welsh Government, 2010; p.76) and this essay explores this strategy and its contribution to effective learning in years 4 and 5, drawing important data from a study which took place in a primary school in Swansea, South Wales.

My research partner and I had one class apiece – I had a year 4 class (ages 8 to 9) with 28 students, whilst my research partner had a year 5 class (ages 9 to 10) with 27 students. After discussing with my research partner, we decided it would be best to select 3 students from each class (6 in total) and ensure that the 3 chosen were as dissimilar as possible. This would enable us to find out whether randomised questioning can positively contribute to effective learning in years 4 and 5.

Literature review

Within literature, there is are significant quantities of suggestions that discourse surrounding questioning within the classroom – from both a teacher’s and student’s perspective – has been conducted widely and deeply (Almeida, 2011; Chin & Osborne, 2008; Graesser & Olde, 2003; Sardarch *et al.*, 2014, Liu & Ding, 2015), particularly since the 1960s (Liu & Ding, 2015). On the contrary, there has also been some literature which has indicated that there has indeed been a lot of research on questioning as a whole, but with regards to more precise areas, such as questioning within the field of formative assessment, there has not been enough attention paid (Jiang, 2014). This is true to some extent, and there is evidence of this as Almeida (2011) demonstrated that research has focused on questioning as a teaching and learning strategy, Sardarch *et al* suggest that the focus is placed more on student learning, and Liu & Ding (2015) highlight how much of this research has been done on questioning and feedback from the teacher’s perspective and the affects these have on the learners.

One common theme is the dominance of teachers. In the 1960s, Floyd (1960) found that 93% of all questions from the classroom are asked by teachers, meanwhile Schreiber (1967) dictated how during half-an-hour sessions, 64 questions are asked by the teacher on average. Although teaching methods, strategies and notions have changed and developed over time, these statistics continue to prevail for decades – Cotton (1988) claimed that half of the lesson is spent on the teacher asking questions, and Graesser & Person (1994) found that the teacher asks 96% of all classroom questions. Drawing from these statistics, teachers have been found to ask 69 questions per hour – or 3000 a year (Almeida, 2011). Teachers have been found to dominate this aspect of classroom life even as recently as 2010 (Almeida & Neri de Souza, 2010).

A large portion of research has been dedicated to questioning because it has been recognised that questioning is a crucial part of the learning process (Almeida, 2011),

particularly within formative assessment (Sardarch *et al.*, 2014). There is widespread belief that, when conducted appropriately, effective questioning can enhance learning through developing reasoning (Sachdeva, 1996), challenging the notions and prior knowledge of learners (Petty, 1998) and consolidating arguments and propositions (James & Baldwin, 1997). However, an important point to consider is that this is dependent on the type of questions being asked (Ramsden, 2003).

This is a reference to Bloom's taxonomy (1956), a classification scheme which focuses on categorising questions into six different stages: remembering (the lower-level questions), understanding, applying, analysing, evaluating and creating (the higher-level questions) (Chandio *et al.*, 2016). To fulfil the potential of effective questioning within the classroom, researchers have stressed the importance of avoiding factual questions (lower-level questions) (Lorsch & Ronkowski, 1982), and asking more high level questions instead (Ramsden, 2003), which can explore misunderstandings (William, 1999), identify next steps (Burns, 2005) and offer opportunities for mixed-ability students to share concepts (Sullivan & Clarke, 1991). This opposed to traditional practices which have a tendency to be lower-level questions (Bartek, 2002; Brookfield, 1987; Myrick & Yonge, 2002; Sellappah *et al.*, 1998).

Another benefit in recognising the importance of questioning within the classroom is the possibility of increasing engagement levels (Lundmark, 2019). Learners do not have a tendency to engage within lessons spontaneously (Marzano *et al.*, 2011), but an introduction of assessment for learning (AfL) strategies have been seen as vital to increasing engagement levels and enhancing learning (Lundmark, 2019). In considering that 'Learners do well when engaging fully in their learning' (Building the Curriculum 3: A Framework for Learning and Teaching, 2008), it has been suggested by other researchers that lollipop sticks are a good way of creating this reality (Kennedy, 2019; Ward, 2019; Lundmark, 2019). This is supported by Black and William (1998) – who said that this strategy can 'raise standards of achievement' (p.1).

Findings from research concluded that there is a general consensus which suggests that learners are more satisfied when lollipop sticks are introduced because, in considering that only 25% of pupils raise their hands in class (William, 2006), the highly-engaged students within a classroom do tend to remain engaged while the entire class would agree that they pay a greater deal of attention (Kennedy, 2019). While offering these benefits, this strategy also offers an opportunity for learners to share their concepts (Lundmark, 2019).

However, it isn't always smooth sailing as these same researchers have indicated how the already-highly-engaged learners have a tendency to become frustrated after some time because they are being refused the opportunity to share their answers (Kennedy, 2019; Ward, 2019; Lundmark, 2019) and this sometimes resulted in lower engagement than initially (Ward, 2019). While this is the effect on the already-highly-engaged learners, the initially-lower-engaged learners can still remain unwilling to contribute during lessons due to low confidence and sometimes the learners might not know the answer (although it has been suggested that the teacher can allow the learner to 'pass' the question on) (Ward, 2019). In addition to this, Lundmark (2019) had pointed out how, although this strategy might have a positive effect on class discussion, the effect that it might have on work

conducted during the main body of each lesson is limited. However, despite these implications, these researchers still believe that the use of lollipop sticks is an effective way of increasing engagement levels within the classroom and enhancing learning.

Explanation of your lesson study design

The methodology conducted within this essay is lesson study research – a form of research which is applied with the intention of developing teacher practice knowledge (Dudley, 2014). An important note to consider is that it has been suggested that the role of teachers should be to focus on improving their performance within the classroom, as opposed to procedural elements of the job, such as attending meetings (Hill, 2013). The Department for Education (2009) indicate how a lesson study should:

- Involve at least two teachers working together to investigate barriers to progression in learning;
- Involve applying different teaching techniques to appropriate audiences to investigate the effect they have;
- Involve data collection so that important information can be passed on to others.

Lesson study research is appropriate within both primary and secondary settings (Department for Education, 2009) and there is a consensus that it has historically been found to be successful in improving learning and teaching (Cordingley *et al.*, 2004; Department for Education, 2009). Amid this success, Dudley dictated how lesson study research can help teachers by:

- Identifying the finer details of pupil learning;
- Clarifying any misconceptions between any assumptions and reality;
- Reflecting upon previous lessons with the intention of identifying next steps;
- Working within a supportive and encouraging environment (Dudley, 2013);
- Changing teaching approaches.

(Dudley, 2011)

These benefits are incredibly important in improving teaching because it has been suggested that a classroom environment is a highly complex working environment (Dudley, 2014) and it has been widely accepted that there is a vast amount of information to take in – too much for a single person to process (Dudley, 2014).

Following the Department for Education's steps (2009; p.8), my research partner and I first agreed that my research partner's class would be the first to be studied (and that the pupils within this class would be named *Child D*, *Child E* and *Child F*) and my class would follow (within my class, the pupils will be named *Child A*, *Child B* and *Child C*). Secondly, we agreed that the focus would be on the effects of randomised questioning (through methods such as lollipop sticks) on effective learning. Thirdly and fourthly, we had planned our lessons and had identified the objectives of our lessons before sharing these objectives with each other and the class and pointing out the different stages of each lesson (introduction, main body and plenary) and how student learning might change throughout these stages. Within this planning, important things were considered, such as resources and key discussions. Next, we had identified pupils to focus on. Within each class, we had identified case pupils

through selective sampling – we decided to choose three that were dissimilar so that we could see the effects randomised questioning has on a variety of pupils (Department for Education, 2009). We also agreed that after each lesson, the three case pupils would be interviewed so that we could collect data which might not have been available from non-participant observation – a type of observation where the observer does not find himself/herself included within the environment, but rather watches and absorbs information (Kumar, 2011). After each lesson, we would refer to Kolb’s cycle of experiential learning (1984) – a four-stage reflective model which analyses the ‘planning, action and evaluation’ of an event (Smith, 2011; p.213). This would give us an insight into how the data collected from each lesson can inform us on how to improve the next lesson (Kolb, 1984).

The data from the non-participant observations would be collected through the use of a *leuven scale*, which will measure the engagement of the learner within the lesson on a scale of 1 to 5, 1 being extremely low (where the child seems absent and displays no energy) and 5 being extremely high (where the child shows continuous and intense activity). Each learner will be assessed on their engagement in each part of the lesson (introduction, main body and plenary) and any additional comments will be added by the observer below these ratings. As this is a qualitative study, each pupil would then have the opportunity to answer approximately eleven questions in a semi-structured interview after the lesson so that we could collect more in-depth data which could then give us a deeper understanding of the reasoning behind events within the classroom and it will also enable us to verify or disprove any theory surrounding this topic (Department for Education, 2009).

Ethical considerations

One of the many things to consider when conducting a lesson study are the ethical considerations. BERA (2018) have stressed the importance that the case pupils remain anonymous and confidential. Henceforth, sensitive details which might exploit their identity cannot be revealed. For the purpose of meeting these requirements, the pupils will be renamed:

My class

- Child A;
- Child B;
- Child C.

My research partner’s class

- Child D;
- Child E;
- Child F.

In addition to this, the school in which this lesson study took place will be named *School X*. This lesson study has received clearance from the University of Wales Trinity Saint David’s ethics panel and when filling in the ethics form, the various risks to participants, investigator and the University/institution were all investigated, considered and mitigated.

Results and analysis

Lesson study 1

	Child D (intro)	Child D (main body)	Child D (plenary)	Child E (intro)	Child E (main body)	Child E (plenary)	Child F (intro)	Child F (main body)	Child F (plenary)
1 (Extremely low)									
2 (Low)				X		X	X		
3 (Moderate)					X				X
4 (High)		X						X	
5 (Extremely high)	X		X						

Figure 1.1 – A leuven scale depicting the engagement levels of each pupil during the three different parts of the first lesson.

As Figure 1.1 shows, Child D was found to have extremely high levels of engagement initially, with the additional comments pointing out that even before lollipop sticks were introduced, Child D had answered both of the two questions asked. This could pose an enquiry into whether or not the use of lollipop sticks might benefit Child D's peers more than Child D as their presence may be more visible. This is an interesting aspect to explore as it was Kennedy (2019), Ward (2019) and Lundmark (2019) who pointed out that sometimes, lollipop sticks have a negative impact on the already-engaged learners because they become frustrated when being refused the opportunity to give their answers and reasons in front of their peers. However, the additional comments revealed that this learner maintained the high engagement levels and sought to be a student who learners could pass the question to if they did not know the answer.

Child D's engagement levels did drop during the main body of the lesson. Child D did participate in some continuous activity, showing intense moments at times, and appeared to be fairly independent while remaining on task for large portions of the main body. Some discussion took place which seemed to largely involve the work. The reason this child was not given an 'extremely high' rating is because there were moments when this learner appeared to exclude himself/herself from discussions with his/her peers about this topic, whereas at other times, he/she had engaged in casual conversation.

During the plenary, Child D's engagement levels had increased again, and the behaviour of the student was very similar to his/her behaviour in the introduction. This meant that the only part of the lesson which had seen Child D's engagement levels decrease was when lollipop sticks were not used. This would henceforth suggest that lollipop sticks would indeed positively affect the learning of Child D.

During the interview after the lesson, Child D showed clear willingness to engage with randomised questions if he/she has sound knowledge of the topic:

Interviewer: What is the first thing which enters your mind when lollipop sticks are being used?

Child D: Sometimes I want to get picked but don't want to get picked if I wasn't thinking about the answer.

He/she had a clear understanding that the use of lollipop sticks would increase engagement levels, but admits that this engagement might not always be made available:

Interviewer: Do you pay more attention when they are being used?

Child D: A bit less attention – out of all the times we've used lollipop sticks in my class, that was only the third time I've ever been picked. It always seems to be other students getting picked rather than me.

(...)

Interviewer: Why do you think teachers use them?

Child D: So engagement levels increase and students think more.

Although Child D's engagement levels had appeared to increase during the use of lollipop sticks, *Figure 1.1* indicates that the engagement levels of Child E had decreased when lollipop sticks were being used. During the introduction, Child E's engagement levels had been labelled as low, as this student had appeared disengaged with the lesson, staring into space or engaging in casual conversation instead. When lollipop sticks were used, however, the learner had showed slightly more engagement, but the engagement levels were still best described as low.

During the main body of the lesson, the learner had appeared to initially engage in the lesson relatively well, as this learner had sat at his/her desk and immediately started writing. However, soon after, Child E had engaged in some casual conversation and after approximately 20 minutes (a third of the way into the lesson), this learner had completed just two sentences. After 35 minutes (almost two thirds of the way into the lesson), this learner had completed four sentences, so the engagement levels had picked up again but were not as high as Child D's.

During the plenary, Child E's engagement levels had decreased again. However, an interesting note to consider is that this learner paid attention to which names were being called out. This asks the question of whether students have a fear of being picked and how this might contribute to engagement levels. However, once a name had been called out and it was not Child E's, this learner had continued to be largely disengaged. If the name called out was Child E's, however, then this learner had showed competence and had managed to answer correctly.

Child E's willingness to blend in with the audience is apparent, even in the post-lesson interview:

Interviewer: How do you feel when you are not selected?

Child E: Very happy because I will have time to think. Gutted if I do know the answer.

Also, his/her answers are not particularly different from his/her peers', which suggests that this learner does not like to stand out in front of others, due to factors such as pressure – which he/she had also mentioned in the post-lesson interview:

Interviewer: Do you ever feel nervous or uncomfortable in any way when these strategies are being used?

Child E: Depends on the topic. If I do, then it's because of the pressure.

If this is the case, then it might be that this learner would prefer to have non-randomised questions, so that he/she could remain in his/her comfort zone, away from the spotlight. Whether this results in positive learning, however, is another concern.

During the introduction, Child F's engagement levels were best described as low. The additional comments reveal that this learner had a nervous appearance when his/her name was called out but managed to answer the question well and fairly quick in considering that this learner does not have an extroverted personality.

During the main body of the lesson, Child F's engagement levels had increased drastically and were labelled as high. This learner had shown real eagerness once sent to his/her table and was independent in looking for resources which might help (such as displays on the wall). The reason that Child F was not marked as having extremely high levels of engagement is because there was some casual conversation which took place and involvement in work had decreased for a small portion of the lesson, but generally, this level of engagement was high.

For the plenary, Child F had reverted back to being slightly more disengaged. This learner was very quiet but, again, when Child F's name was pulled out, he/she knew the answer very quickly. This indicates that there is a lack of confidence, and he/she would not always benefit from a 'hands-up' approach, so these results suggest that it is possible that Child F would benefit from lollipop sticks.

Child F's engagement levels thrived when lollipop sticks were not used. This learner's dissatisfaction with this strategy is also mentioned in the post-lesson interview:

Interviewer: What is the first thing which enters your mind when lollipop sticks are being used?

Child F: Depends on the questions. Can enter a state of shock and freeze up or worry.

(...)

Interviewer: Do you ever feel nervous or uncomfortable in any way when these strategies are being used?

Child F: Most of the time, yes.

Interviewer: Do you think they make anybody else feel nervous or uncomfortable in any way when they are being used?

Child F: Nervous as it can be embarrassing.

(...)

Interviewer: Do you think they should be used more often, less often or do you think there shouldn't be any change?

Child F: It can be a waste of time – less often.

He/she suggested a solution which could be used to make the lesson better:

Interviewer: How could I have made the lesson better?

Child F: Group answers would be better as you can work together and help each other.

So, taking this into consideration, my research partner and I reflected upon this lesson using Kolb's cycle of experiential learning (1984). We decided we would implement groups into this strategy so that we could explore how these can aid the learning process. We also felt that the data collection method was effective as we were able to read the relationship of engagement throughout the whole lesson and delve deeper to come to terms with the reasoning behind certain concepts, so we decided that the data collection tools would remain the same.

Lesson study 2

	Child A (intro)	Child A (main body)	Child A (plenary)	Child B (intro)	Child B (main body)	Child B (plenary)	Child C (intro)	Child C (main body)	Child C (plenary)
1 (Extremely low)									
2 (Low)									
3 (Moderate)		X					X		X
4 (High)			X	X				X	
5 (Extremely high)	X				X	X			

Figure 1.2 – A leuven scale depicting the engagement levels of each pupil during the three different parts of the second lesson.

Figure 1.2 illustrates results which differ from the results from the first lesson study. An important note to mention is that this lesson was conducted slightly different to the first lesson as this one took the feedback from the first lesson into consideration and the learners were placed into groups; so they were expected to share concepts and reach an agreement on an answer, rather than be expected to answer individually.

As *Figure 1.2* depicts, Child A had extremely high engagement levels during the beginning of the lesson and showed eagerness to lead his/her group. An interesting note to take into

account is that when non-randomised questions were asked (such as hands-up), the likelihood of this learner showing as much engagement was low.

During the main body of the lesson, engagement levels had decreased, and he/she took some time to sit down as he/she was distracted and found himself/herself wandering around the room. This would certainly validate the claim made by Lundmark (2019), which suggested that the use of lollipop sticks would influence the engagement levels in environments which include discussion, however influence on the learning in different environments might be limited.

Further evidence of this is existent in the plenary of the lesson as Child A had found his/her engagement levels increase again, with the re-introduction of lollipop sticks. This learner was not easily distracted and really showed willingness to participate in group discussions.

It could be suggested that Child A enjoys class discussions, finding them exciting, and that this would be a better approach to learning, as opposed to activities used within the main body:

Interviewer: What is the first thing which enters your mind when lollipop sticks are being used?

Child A: Who is going to come out? What will that person say?

This learner certainly enjoyed the opportunity to answer the questions as a group, thus validating the changes made from the first study:

Interviewer: Is it better answering questions in a group or as an individual?

Child A: In a group. We can discuss ideas and check answers before answering.

During the introduction, Child B had high engagement levels and participated a lot, answering questions within his/her group. Also, the likelihood of Child B putting his/her hands up for non-randomised questions was low, too.

However, Child B's engagement levels had increased during the main body of the lesson. He/she was very focused on the task, and rather than wandering around the classroom, he/she sat down immediately, wrote the date and learning intention (L.I.) and began work. There was some discussion which took place during the main body of the lesson, but all of this discussion was centred around the work.

During the plenary, this learner's extremely high engagement levels were maintained. He/she had listened to other responses well and was deeply engaged in the lesson. This behaviour suggests that this learner would certainly benefit from the use of lollipop sticks, as the likelihood of high engagement levels would be relatively low as this learner appeared reluctant to place his/her hand up for non-randomised questions.

The post-lesson interview had suggested that this learner had also found the process fun, but also this learner genuinely wanted to learn, which correlated with the findings from the observation:

Interviewer: How do you feel when you are selected?

Child B: Happy. We can discuss in groups.

(...)

Interviewer: Do you ever feel nervous or uncomfortable in any way when these strategies are being used?

Child B: No, it's fun as it might be you next.

Child C's results differ from Child A's and Child B's. At the beginning of the lesson, Child C appeared to 'switch off' when his/her group was not chosen to answer a question. This is interesting, though, because when the whole class was being asked a non-randomised question, this learner seemed very eager to put his/her hand up. From the observation, this learner certainly reacted better to non-randomised questions as opposed to randomised questions.

During the main body of the lesson, this learner's engagement levels had increased and he/she had remained on task for the majority of the lesson. There were moments within the lesson where he/she had engaged in some casual conversation, but generally, the conversation was centred around the work set. One essential note to consider, however, is that this learner appeared to constantly refer to the teaching assistant (T.A.) for reassurance with his/her work. This could be related to why this learner 'switches off' when non-randomised questions are asked, because the reassurance from authoritative figures might act as an incentive for him, which means that the likelihood of achieving this incentive might be decreased with the introduction of lollipop sticks.

There is further evidence of this in the plenary of the lesson, as this learner's engagement levels had decreased again and his/her behaviour was similar to the introduction of the lesson, where he/she had appeared to pay less attention when his responsibilities are not called upon. Within the interview, Child C's statements had reinforced this notion:

Interviewer: How do you feel when you are selected?

Child C: Excited because myself and my friends can answer.

(...)

Interviewer: How could I have made the lesson better?

Child C: Should also have independent lollipop sticks too.

These statements correlate with the pursuit of reassurance that the learner appears to seek constantly. This henceforth indicates that he/she would have a more positive learning attitude if non-randomised questions were asked.

Discussion

As literature has pointed out, a large portion of discourse surrounding questioning within classroom was directed towards the dominance of teachers when asking questions (for

example, see: Floyd, 1960; Schreiber, 1967; Cotton, 1988; Graesser & Person, 1994; Almeida, 2011; Almeida & Neri de Souza, 2010). While it was suggested that the formative assessment field could enhance learning (Sardarch *et al.*, 2014), this lesson study could not validate these claims. Indeed, the case pupils had admitted that a greater degree of attention was paid during the lessons (see appendix), the learners had not offered an input different to providing their answers.

This has a ripple effect on this field of literature as Petty (1998), James & Baldwin (1997) and Ramsden) had indicated that, providing the questions were higher-order questions (Bloom, 1956), the learning process could be enhanced. Due to the learners not engaging in a way that they were asking questions, this lesson study contradicts these suggestions.

Further literature suggested that the use of lollipop sticks increase the levels of engagement (Lundmark, 2019; Kennedy, 2019; Ward, 2019). This lesson study generally validates this claim. The engagement levels were erratic between each student, even throughout different parts of the lesson (see *Figure 1.1* and *Figure 1.2*), but one could argue that this is the norm in Year 4 and Year 5 students. However, an important note to highlight is that two common cases had occurred between each student, either: (i) the engagement levels had increased at some point after the use of lollipop sticks; or (ii) the engagement levels had increased during the use of lollipop sticks. In considering that each pupil would have idiosyncratic characteristics, we must consider that the effects would happen differently too, and at different times. This therefore validates these claims made by Lundmark (2019), Ward (2019) and Kennedy (2019).

It was suggested that using lollipop sticks can be a good way of eliciting full engagement in the learning process, which enhances the learning (Building the Curriculum 3: A Framework for Learning and Teaching, 2008; Kennedy, 2019; Ward, 2019; Lundmark, 2019), and this lesson study supports this statement to some degree, but it would not completely agree with Black and William's claim which suggested that using lollipop sticks would 'raise standards of achievement' (1998; p.1). Although these illustrations are not polar opposites, or completely different at all, there is a thin line. This lesson study supports the notion that it can elicit a higher degree of engagement, but it would not directly result in higher standards of achievement. Certainly, higher degrees of engagement can elicit greater attainment, but as the results of this lesson study illustrate, there was a minority of students whose attitudes had decreased during the main body of the lesson. It does suggest, however, that achieving higher levels of engagement can be a step towards eliciting higher standards of achievement.

Also, while William (2006) suggested that learners are more satisfied with the use of lollipop sticks in comparison to non-randomised questions, this lesson study contradicts this as there is clear evidence that some pupils' notions of the use of lollipop sticks are that they are a waste of time. Similarly, Kennedy had indicated that the entire class would agree that they pay a greater deal of attention (2019). This, again, is contradicted because the results show that once the learners know that they won't be expected to deliver an answer, they switch off (see: Child C).

One aspect of the literature which this lesson study does agree with is the claim that already-highly-engaged learners become frustrated when their name does not get pulled out (Kennedy, 2019; Ward, 2019; Lundmark, 2019) and that this can result in lower engagement than initially (Ward, 2019) – this was clear with Child C. Literature also suggested that it does not necessarily guarantee that initially-lower-engaged learners would become more engaged (Ward, 2019). Although it was pointed out that learners could have the opportunity of passing the question on, this lesson study found out that this is defeating the object because when the learners were able to do this, it was found that they would often pass it on to someone who would put their hand up (Child D and E).

Conclusion and recommendations

This lesson study has opened the door to progression within this strategy. The interviews which took place after the second lesson have shown that group responses are better than the traditional method of lollipop sticks (Welsh Government, 2010). However, as the analysis of the second lesson plan illustrates, this is not the answer. It is clear that there is still much work to be done. The foundations have clearly been set as the literature has common themes, but within some of this literature there are things which could lead readers to presume that these results would be consistent. This is not the case, as this lesson study has shown multiple times, in numerous areas.

There are multiple things within this field which this lesson study contradicts, however, only to a certain degree. For example, Kennedy (2019), Lundmark (2019) and Ward (2019) all claimed that the use of lollipop sticks would elicit higher engagement levels. This lesson study does indeed agree with this, though not completely, because this lesson study found that some of the case pupils had remained low-engaged during the parts of the lesson where the lollipop sticks were used. Meanwhile, when sent to their tables, we found that their engagement levels had increased. It's important to stress that this is not the case for all pupil, but rather, as this study shows, it is an occurrence which happens from time to time.

There are also other things which this lesson study completely disagrees with. For instance, the notion that all pupils would be satisfied with the use of lollipop sticks. This lesson study clearly illustrates that the use of lollipop sticks does not always elicit positive learning attitudes, but rather, they can cause the emergence of negative emotions, such as anxiety and a positive learning attitude would not involve learning in fear or anxiety.

On the other hand, there are some elements which this study agrees with, like the suggestion that the use of lollipop sticks can come with negative connotations for already-highly-engaged pupils. This is a really important and positive note because prior to this lesson study, I had the misconception that lollipop sticks would benefit everybody, but I hadn't put much thought into how it would affect all pupils.

In considering this, I would urge other researchers to investigate how this strategy might be improved. There is clear evidence that it has some benefits already, but there is even stronger evidence which points to the fact that this strategy's potential has not yet been fulfilled. I've used the word potential here because I think it's important to perceive this strategy not in a way that suggests that it is a finished product, but rather as a work in

progress. I do believe that it has not been implemented completely flawlessly yet, and this lesson study provides plenty of evidence to support that, but I also believe that with some further research, we could see a better implementation of this strategy.

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