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Module Title: The Enquiring Teacher

**Research Question: How can 'thinking time'
develop pupil response to the learning
outcome?**

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ASSIGNMENT DETAILS AND FEEDBACK

SOUTH WEST WALES CENTRE FOR TEACHER EDUCATION

*Sections marked with * should be completed by module lead*

Student name:	Rebecca White	Student P number:	1700141
Programme: *	PGCE Primary		
Module: *	The Enquiring Teacher	Module Level (6 or 7):*	7
Module code: *	M7X2152	Contribution to Overall Module Assessment (%): *	100%
Module Lead:*	Catherine Morgan		
Assignment Title:*	Write a critical and analytical essay that discusses your practitioner research 'lesson study' in relation to a chosen field.	Assignment No (x of x):*	1/1
Start date:*	09/01/18	Submission deadline:*	16/04/18
Return date of provisional marks & written feedback:*			

Referencing:	In the main body of your submission you must give credit to authors on whose research your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have read or quoted in order to complete this assignment (e.g. for books: surname of author and initials, year of publication, <u>title of book</u> , edition, publisher: place of publication).			
Submission:	All assignments must be submitted to Turnitin unless otherwise instructed by the Lecturer. Note: the Turnitin version is the primary submission and acts as a receipt for the student. Late submission of the electronic version of the assignment will result in a late penalty. Penalties for late submission: Up to one week late, maximum grade D. Over one week late, Refer. Only the Extenuating Circumstances Panel may grant an extension.	Date:	16/04/18	
Module lead to tick to indicate if a hard copy version of the assignment must be submitted.*			YES	
			NO	✓

MARKING CRITERIA AND STUDENT FEEDBACK

Common Assessment Criteria Applied		Grade awarded
1. Subject Knowledge and Understanding (which includes using research-informed literature and knowledge and understanding of the subject) Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions. Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.		
2. Intellectual Skills (Analysis) Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence		
3. Pedagogic and Professional Applications (Practical Application and Deployment) Deployment of pedagogic methods, materials, tools and techniques; application of concepts; formulation of innovative and creative solutions to solve problems. Attributes in professional practice: individual and collaborative working		
4. Key Transferable Skills Deployment of appropriate media; presentation and organisation.		
Assignment Grade (Assessment grades are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)	
	Up to 1 week late	D Max
	Over 1 week late	Fail

Student Self Evaluation Form

Common Assessment Criteria Applied	REFER		D	C	B	A
	OUTRIGHT FAIL	UNSATISFACTORY	SATISFACTORY	GOOD	VERY GOOD	EXCELLENT
1. Subject Knowledge and Understanding (which includes using research-informed literature and knowledge and understanding of the subject)	☐	☐	☐	☐	X	☐
2. Intellectual Skills (Analysis)	☐	☐	☐	X	☐	☐
3. Pedagogic and Professional Applications (Practical Application and Deployment)	☐	☐	☐	X	☐	☐
4. Key Transferable Skills	☐	☐	☐	☐	X	☐

PLEASE COMMENT ON AREAS IN WHICH YOU FEEL THAT YOU HAVE PERFORMED WELL	PLEASE COMMENT ON AREAS YOU FEEL THAT YOU NEED TO DEVELOP
I believe that both the chosen methodology and research subject produced interesting information and conclusions.	I believe that a variation of analytical techniques could have been used.

Student's Name	Rebecca White	Date	15/04/18
Student's Signature			

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The Enquiring Teacher - How can thinking time develop pupil response to the learning outcome?

Purpose and Context of Research

A primary school classroom is busy, productive and inquisitive environment; particularly exemplified in my Reception Class, while on placement within a Swansea school. I was initially greeted by a sign on the door that said;

"Sorry about the laughter, noise, chaos, and mess ... but we are learning!"

My classroom was bursting with energy and noise, time seemed to rush and there was always something for the children to be doing. While fast and noisy classroom environments are advocated by many academics for productive learning, such as Vogelsang (2014), sometimes children may require more time to simply stop and think. The sheer pace of learning, whether due to school, Government, curriculum or parental expectations, is constant and there seemed to be little time for children to think deeply about their actions and thoughts.

On average, teachers only wait between 0.7 and 1.4 seconds for an answer to a question before repeating the question or rewording it (Stahl, 1994). Children don't necessarily have enough time to process questions and respond to the best of their ability. However, Rowe (1972) observed that when teachers allowed at least 3 seconds of 'thinking time', more class members will get involved, with better quality answers and students are more likely to ask their own questions. There was little opportunity for children to have 'sufficient' thinking time', and this issue identified in my Reception Class was also identified in my research partner's Year One class, as all classrooms have similar pressures, despite the difference in school contexts and location.

My research partner's School (School 1) is situated in the centre of Bridgend with 437 pupils on roll (Estyn, 2017). Around 8% of pupils are eligible for free school meals and very few pupils are looked after by the local authority (Estyn, 2017). My School (School 2) is a primary school in the east of Swansea with 353 pupils on roll (Estyn, 2014). School 2 has a larger percentage of pupils that are eligible for free school meals, at around 35% (Estyn, 2014).

Though our research findings may have different implications for each school, due to their individual needs and context, a joint research questions was formulated;

"How can 'thinking time' develop pupil response to the learning outcome?"

Though seemingly broad in nature, through a review of literature, specific elements of 'thinking time' have been identified for a narrowed focus and discussion.

Review of Literature

Upon being tasked with a research project that could focus upon anything, finding a focus is difficult. According to Clough and Nutbrown, the key to successful observations and research involving children in classrooms, as a teacher who is immersed in the environment, is to adopt a "schematic lens...to make the "familiar strange"(2007:48). One must stand back and reflect upon 'second nature' aspects to make successful observations. It was during the process of scrutinising a typical noisy question and answer session in School 2 Reception class that the importance of 'thinking time' reared.

The concept of 'thinking time' begins with the work of Mary Budd Rowe (1972) who began to query the quality of children's answers when only given on average a second to respond to a question (Rowe, 1972). To encourage higher-order thinking, Rowe advocated a "wait-time" of three seconds (1972). The definition then merges with the work of Stahl (1985) who constructed the concept of "think-time", defined as "a distinct period of uninterrupted silence by the teacher and all students so that they both can complete appropriate information processing tasks, feelings, oral responses, and actions" (Stahl, 1994:2). In its most simple form, and for the purpose of this research, 'thinking time' is defined as the silent processing period between enquiry and response, from both teachers and children in a classroom setting.

The concept of 'thinking time' has received much attention in academia and politics regarding effective assessment and questioning (for example Blosser, 2000; DfES, 2004; Johannessen, 2003; Loughran, 2010). The work implies that 'thinking time' gives students more time to process thoughts and reflect deeply upon the enquiry, resulting in finer learning (Mercer & Dawes, 2008). Yet most commonly in classrooms, dialogue often takes

the form of question and an expected rapid answer, where the potential for pauses is minimised (Sacks, Schegloff, & Jefferson, 1974). Some academics (Jefferson, 1988) would suggest that when pauses between question and response were longer than one second, participants could consider this to be 'trouble' and scramble and answer with their first thought (McHoul, 1990). Teachers also react in a similar fashion, usually rephrasing the enquiry or adding additional information (Macbeth, 2004). This rapid style of questioning does not optimise time or children's learning and there are a great deal of benefits associated with extending 'thinking time' beyond the average second (Ingram & Elliott, 2015).

Throughout literature extended 'thinking time' has been shown to positively affect both student and teacher behaviour (Ingram & Elliott, 2015). According to a study by (Ingram & Elliott, 2015), extending 'thinking time' to around three seconds resulted in fewer failures to answer or 'I don't know' responses from children. Ingram and Elliott (2015) also found that when 'thinking time' was increased, children produced longer responses that often included quality explanations or reasoning. This can then lead to the children asking more questions and influences an increase in peer to peer discussion (Rowe, 1986). Such characteristics are perceived as desirable in the context of classroom discussion (Mercer et.al., 2004).

The many benefits of 'thinking time' are also noted in a review by Tobin (1987), who identified links between increased 'thinking time' and higher cognitive achievement in STEM (Science, Technology, Engineering and Mathematics) subjects. For subjects such as these in particular, it is important that students realise that opportunities to think are vital and must not "believe that every problem should be solvable with little or no thinking" (Lesh & Zawojewski, 2007).

The use of 'thinking time' can also extend to teachers as Rowe (1986) reported that "the number and nature of teacher questions changed with extended wait time, "they are fewer, but they are more likely to invite elaboration, explanation or alternative viewpoints, each of which indicates the relevance of manipulating wait time for dialogic teaching" (Rowe 1986 in Ingram & Elliott, 2015:43). Not only do the children get time to respond fully to a question, but allowing a pause after that response for reply also gives teachers time to utilise and use what the child has said. This idea is noted by Rowe (1986) who reported

greater flexibility of teacher and child interactions that allowed greater continuity in the development of ideas. Teachers themselves noted the importance of the 'thinking time' and went as far to say that their opinion of children in their class altered and expectations changed; with previously labelled 'less able' students simply needing more time than some peers to respond, facilitating high end responses (Kirton et.al., 2007).

Much of the research previously mentioned has involved students of all ages, yet for the purpose of this research where the participants are aged four to six, the independence required by 'thinking time' had to be considered. As children in the Foundation Phase in Welsh schools have limited verbal language, much communication is expressed through body language. Yang (2016) infers that younger children can become 'distracted, bored and tired' when using formal verbal language for an extended period of time. According to Yang (2016:711), body language, especially for younger children, provides "image communication" that allows teachers to fully express and extend what they are saying, while engaging the children. If a teacher expresses negative body language, younger children are likely to imitate such behaviour, which may disengage them during 'thinking time' (Yang, 2016). The teacher and child have to work together here to make the 'thinking time' productive, in order to reap the benefits previously discussed. Yang (2016:713) identified four different elements of body language that can engage young children during 'thinking time', these include; Eye Contact, to involve all students; Gestures, to express thought through body movements; Posture, positive upright sitting or standing to stimulate interest; and Facial Expression, to convey feelings and attitudes. When these visual elements of communication are combined, younger children are able to engage fully in 'thinking time'; teachers and children can utilize the time to hopefully facilitate complete learning.

The benefits of increased 'thinking time' seem vast, yet there is some literature that suggests that when used ineffectively, 'thinking time' can actually lead to boredom and disengagement (Kirton et.al., 2007). In a study conducted by Duell (1994), when 'thinking time' was increased to six seconds, responses were of a lower level as students felt obliged to say something of any quality and some became bored. However this study was conducted in a university setting and may not be true of younger children. It has also been noted by some academics that for certain students that were able to respond quickly with a

'higher end' answer, they became bored and flows of thought were sporadic (Kirton et.al., 2007). Yet one would argue that if children were taught to use the time sufficiently, all responses could be furthered, therefore a culture of 'thinking time' must be taught for the pauses to be used successfully.

For any of the benefits of 'thinking time' that have been discussed previously to occur, pauses between enquiry and response must become a 'norm of interaction' (Ingram & Elliott, 2015). Students must become accustomed to using the time to actually think and not waste the opportunity. Through integrating the concept of 'thinking time' and employing good pedagogy, such as the use of physical elements like body language as previously mentioned, children should produce 'fuller' responses (compared to the average one second questioning) (Rowe, 1986).

From a review of literature, a research question was formed regarding the development of pupil response when 'thinking time' was allowed. With regards to the age of the participants, and broadness of initial question, additional elements were identified to produce research aims to refine findings, they include:

- To observe pupil response when 'thinking time' is increased to three seconds
- To observe the use of teacher body language and the impact it has on children during 'thinking time'
- To observe the use of gestures in engaging children during 'thinking time'

These three research aims allow us to focus upon different elements of young children's response during 'thinking time'. The ethical implications of completing this research and methodology will be discussed subsequently.

Ethics and Methodology

Prior to the completion of research, one must be considerate of the ethical implications, particularly when working with very young children. This research regards 'ethics' as "a set of moral principles and rules of conduct...to prevent harming or wronging" (Morrow & Richards, 1996:90). Within rules of conduct often falls respect, and some adults tend to be disrespectful of children's views and opinions (Sieber, 1993). To ensure that children are

respected in research, many professional institutions issue codes and guidelines to follow (Morrow & Richards, 1996). This research will abide by three guidelines, as outlined in the Ethics Form (Appendix 9), they include; British Education Research Association Ethical Guidelines (2011), UWTSD Research Ethics & Integrity Code of Practice Guidelines (2017) and the Education Workforce Council Code of Practice (2017).

There are a few overarching 'preoccupations' in all research ethics guidelines that include consent and the protection of research respondents (including data storage) (Morrow & Richards, 1996). Consent was gained from guardians as prior to the investigation, a letter has been sent to the guardians of the proposed participants to gain 'informed consent' as the children are under 18. However, as we want to respect the children, they themselves will be asked to 'assent'. Assent involves informing the children about the research and asking them if they wish to participate, as they don't have the legal capacity to consent (OHRPP, 2016). The researchers gained assent by reading a statement to the class to inform them of the research process and their freedom to not participate or withdraw at any time (Appendix 7 & 8). The consent and assent of each pupil was recorded on a form designed by the researchers to ensure that pupils could participate (Appendix 5 & 6). The children's names have been obscured and numbers and letters have been assigned to protect their identity. Ongoing assent was monitored through children's actions and body language, and if deemed 'negative', children would have been withdrawn from the process. The children were asked to give a 'thumbs up' if they give assent or to put their finger on their nose if they are unsure about anything. The children did this with their eyes closed to exclude peer influence. The results were then recorded as a part of our methodology which will be discussed shortly.

To protect the research respondents, anonymity was given to all participants in any notes and quotations. Confidentiality exists as only my research partner and I have access to data and any data has been encrypted and archived.

The ethical considerations that are necessary for research regarding children have a profound impact upon the chosen methodologies. The most appropriate methodology was deemed to be 'lesson study' as developed by Peter Dudley (2011). Lesson study (LS) is a form of classroom action research (in field study) that aims to develop teacher pedagogy (Dudley, 2011). It has been deemed particularly effective in Japan and the US due to the

collaborative aspect and successful improvement in many aspects of pedagogy (Dudley, 2011). The collaborative working allows professionals to make the "familiar strange"(Clough & Nutbrown, 2007:48) as so many aspects of daily teaching become second nature and difficult to reflect upon (Dudley, 2011).

For the purpose of this research, the 'lesson study' will be completed in a pair, firstly in a Year One class In Bridgend (School 1) and then in a Reception class in Swansea (School 2) after the reflective process. Despite Dudley (2011) recommending a group of three, the circumstances of this assignment require a research pair. As a pair, 'lesson study' requires us to plan, teach, observe and reflect upon/analyse two research lessons, with the aim of refining an element of pedagogy (Dudley, 2011).

The first stage, 'Planning', has many elements. Following the selection of a research topic, in this instance 'thinking time', three case pupils from each class must be identified. In each class of 29, we randomly chose (from a hat) one pupil from each ability group (one higher ability, one middle ability and one lower ability). In the event of absence, a new name will be randomly drawn. The only children that can be randomly drawn are children who have given assent and children who have gained informed consent from parents. This method of selection reiterates the importance of considering ethical guidelines throughout methodology construction.

With the pupils, schools and ethical considerations in mind, the lesson for school one was jointly planned. Dudley (2011) advocates a plan that is thorough for each stage of the lesson; so due to our familiarity with the UWTSD planning documents, this template was used in place of Dudley's (2011). As visible in Appendix 1, the first lesson plan involves the reading of a rocket ship story, with pre-determined questions. Despite Ingram & Elliott's (2015) suggestion that story-telling has minimal potential for pauses and therefore 'thinking time', our plan includes strategic pauses at points where the children can be challenged. The plan (Appendix 1) also includes the differentiated main task, in which the children are expected to draw and talk about a place they would go in their rocket ship and why (following on from the story). In order to document the elements of this lesson, the observational element of Dudley's 'lesson study' must be considered (2011).

Prior to teaching the research lesson, it is imperative that the methodology of observation is considered. In compliance with Dudley (2011), but with influences from other academic

sources, the research observations will be semi-structured and will be recorded using an observation schedule and field notes. The term semi structured has been used due to the use of many pre-determined elements, but flexibility will be used to allow for responses to be explored. These observations will involve the whole class (consented/assented), but mainly preselected case pupils.

The semi-structured nature of the observation implies that the researchers can follow a clear set of instructions during the lesson that can provide reliable, comparable qualitative data; yet researchers allow themselves to sometimes deviate if the opportunity for identifying new ways of seeing and understanding the topic at hand occur (Cohen & Crabtree, 2006). This flexibility is noted as a great strength of semi-structured interviews as topics not initially considered can rear and produce useful information (Adams & Cox, 2008). However, if there is too much deviation, some academics suggest that data becomes more difficult to analyse and time could be wasted (Adams & Cox, 2008).

In order to limit time wasting although retaining flexibility, an observation schedule has been created (Appendix 3). The observation schedule provides a clear purpose for observation and produces quantifiable categorised results (Waxman et.al, 1999). The schedule includes the findings from the research lesson, information obtained from the three target pupils and information from field notes that were deemed important and relevant (on topic) by both researchers (Appendix 3 & 4). The combination of the qualitative schedule table, with the more qualitative additional comments and notes produces a bounty of information for analysis.

The previously mentioned field notes are another segment of the chosen methodology that will be completed by the researcher who is not teaching the lesson. The notes are taken with little structure and freedom to allow the recording of anything deemed relevant by the researcher. To complete these notes and observe with flexibility, the researcher who is not teaching makes a 'non-participant observation'. This simply involves a researcher observing with the participants knowledge, without taking part in the activity (Dictionary of Sociology, 1998). This approach is sometimes criticised as it could cause a conscious change in behaviour (Hawthorne effect), however the children in this study are used to being watched for assessment purposes (Bendix, 2000). This style of observation is also required by Dudley in his LS methodology (2011).

Completing such a thorough plan of the lesson, methods of observation and recording of findings allow the teaching of the lesson to run smoothly. Then follows arguably the most vital components of the 'lesson study' methodology; interviews of participants and reflection. After the completion of the lesson, a focus group with the three target pupils was completed. Dudley (2011) infers that the 'interview' should be short and completed at first opportunity. The flexible and semi structured nature of the focus group meant that our pre-prepared questions could direct the discussion (Appendix 3 &4), but opportunities for input from the children could arise; this is a great benefit of focus groups according to Adams and Cox (2008). The information from this focus group was then immediately discussed, along with all observations and notes taken during the lesson. It was imperative that researchers were open to "critical viewpoints and suggestions" (Dudley, 2011:13), so that progress can be made and suggestions raised in preparation for the follow up lesson. Any important information raised in the discussion has been recorded as part of the observation schedule, (which mixes both quantitative and qualitative data) (Appendix 3&4) and will be discussed shortly. The suggestions were then used to inform improvements for the second lesson and the whole methodology process was repeated.

Through the joint planning of subject focus, case pupils, lesson focus, observation technique and recording, interview technique and reflection technique, while considering Dudley's 'lesson study' framework and ethical guidelines, the research provided much useful information for discussion.

Lesson Study 1 and Analysis

The first lesson and focus group was carried out at School One in Bridgend and lasted for 1 hour and 15 minutes, with all elements occurring in succession. To analyse the first lesson thoroughly, the three research aims regarding length of 'thinking time', body language and gestures will be considered throughout the discussion (the raw data is included in Appendix 3).

As visible in the lesson plan (Appendix 1), the children were read the book "Back to Earth with a Bump" (Twinkl, 2017) that tells of a boy who went to space on his rocket ship bed. The 29 participants of varying ability were first expected to answer questions throughout

the reading of the book and make predictions when asked by the teacher. Prior to the reading of the story, the children were told that they would have plenty of time to think about their answers and that there was no rush, but 'thinking time' was not specifically referred to. All children were given three seconds or more to answer before any prompts or rewording occurred. The main task that followed required the children to draw a picture of where they would take their rocket ship. They were told it could be anywhere but they must explain why they chose that place. Questions were asked throughout the task by the teacher and again three seconds were given for 'thinking time'. There were different expectations for different ability groups as the higher ability were expected to write about where they were going and why, the middle ability (MA) were expected to write a sentence explaining their picture and the lower ability (LA) were expected to write key explanatory words.

There was a variation of response to the task and use of 'thinking time'. All participants engaged with the task and completed a picture and questions. However, there appeared to be some variation in the effective use of 'thinking time' between the ability groups. During the story and questions, the HA children took time after questions were asked before putting their hands up. The answers they produced often included aspects of prior knowledge for example, when the teacher asked about predictions for the front cover that contained planets, stars and rockets, the HA focus pupil stated that:

HA- *"The boy could be going to Mars"*

Teacher - *"Why do you think he is going to Mars"*

HA- (pause) *"because that planet is red and Mars is close to where we live"*

The HA children used the time to extend their answers and thought carefully about their justification. The HA children displayed 'positive' body language as they were facing and looking at the teacher, they appeared to be engaged with the task.

However, despite being given at least three seconds of 'thinking time', the LA children displayed more 'negative' body language and sometimes became disengaged during the pause given for 'thinking time'. The LA focus pupil often gave short answers and sometimes looked out of the window in moments of pause. Despite the difference in engagement and length of answer, the LA pupil did produce relevant answers, at which the teacher was surprised. When questioned upon his decision to travel to Mars (Figure 3), the LA pupil

replied, "*because I like aliens*". The teacher expected the child to simply say "because I like it"; yet the child did pause slightly and produce an answer linked to space.



Figure 1 - HA work, School 1 (White, 2018)



Figure 2 - MA work, School 1 (White, 2018)



Figure 3 - LA work, School 1 (White, 2018)

From the analysis of data, one would suggest that children were mostly engaged with the task and benefitted from three seconds 'thinking time' but to different extents. The HA child extended their answer and showed full concentration during 'thinking time'; while the LA child was slightly more distracted and produced useful but limited answers.

Throughout the lesson, the teacher made a conscious effort to pause for three seconds for 'thinking time' and gave encouragement of thought frequently. When the teacher faced the class with an interested expression, the children made eye contact with the teacher and were using time to think about their responses. However, when the teacher turned to look at the book, MA and LA children paid less attention and did not engage completely. When

the teacher noticed that some pupils were distracted, the teacher would gesture toward her head, eyes and ears and suggest that "*we switch our brains, looking eyes and listening ears on*"; of which some children copied. This would reengage the children and indicate an importance of body language and gestures in keeping children involved in 'thinking time'. When the target children were questioned during the focus group about the teachers listening and engagement, they all believed that the teacher "did good listening and questions".

There were a number of elements identified by participants and researchers for improvement in the second research lesson. Observational and focus group data suggested that the questions could be both more challenging, and open ended in certain areas as the MA child stated that they would like more structure, while the HA stated that they would like to develop topics further. When questioned upon the subject of the task, all children were clear that the lesson concentrated upon "thinking hard", suggesting an appropriate lesson plan, however when questioned upon the sufficiency of 'thinking time' duration, the LA pupil requested "*more time*". Conversely, as discussed, this pupil was often distracted during the given 'thinking time'; one would suggest that if that LA pupil was fully engaged, the duration may prove sufficient. The use of gesture and body language seemed more significant to LA and MA children to keep them engaged and interested, with a physical prop in the form of a thinking-hat being requested by the LA pupil to make the lesson better.

From the analysis of focus group and observational data, to further develop pupil response to 'thinking time', one will include physical thinking-hats to draw attention to the importance of thinking and concentration. More open ended questions will be included but the duration of 'thinking time' will be kept to three seconds, as many pupils produced extended answers.

Lesson Study 2 and Analysis

The second lesson and focus group were carried out at School Two in Swansea and lasted for 1 hour, with all elements occurring in succession once again. To analyse the second lesson thoroughly, the research aims and recommendations from the first lesson study will be considered (the raw data is included in Appendix 4).

The lesson plan and expectations of the children in each ability group in the second lesson remain almost identical to the first (Appendix 2). However, from the reflections of the first lesson, the children were given physical thinking-hats (Figure 4) and explicitly told about 'thinking time'.

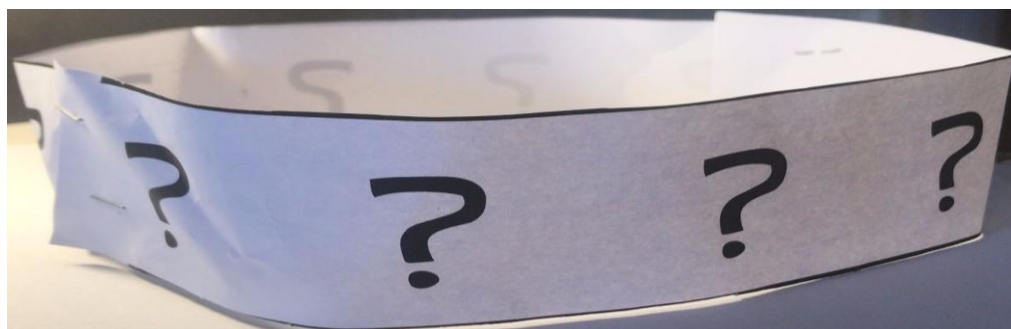


Figure 4- Thinking-hat (White, 2018)

Questions were asked throughout the task by the teacher and again three seconds were given for 'thinking time'. However, as identified in the first lesson, the questions in the second lesson were less structured and focused upon the response given by the child. The teacher was able to utilise the 'thinking time' in this manner and make the questions challenging and especially relevant to the discussion.

The 29 children were all engaged with the task and completed a picture and questions. Yet even with the introduction of thinking-hats and more open questions, there was again a slight variation of response to the task and use of 'thinking time'. Initially, all participants responded well to the introduction of thinking-hats and seemed to like the prop. From prior teacher knowledge, there was a visible improvement in the level of concentration from all ability groups as the props drew attention to the importance of thinking in the allotted time. This was evidenced during the focus group as all focus children stated that the thinking-hats helped them to concentrate. However as the lesson progressed, the LA pupil became distracted in parts and displayed uninterested body language such as turning around and looking down at the desk. The LA also took the thinking-hat off in one instance and played with it. Conversely, during this behaviour displayed by the LA pupil, the thinking-hat proved very important in the level of thinking to the HA pupil as they stated to the LA pupil:

HA- *"You're not thinking properly or listening because you haven't got your hat on. Put it on!"*

Despite being a slight distraction to the LA child at some points during the lesson, the thinking-hat proved to be a useful prop and highlighted the importance of "good thinking" during 'thinking time' pauses.

The duration of the 'thinking time' remained unchanged in both research lessons. The duration of three seconds remained appropriate for the HA and MA child with the LA child once again stating they would like more time. However, the teachers' prior knowledge would suggest that the moments of distraction were again a likely cause for this response. Throughout the lesson, the teacher made a conscious effort to display enthusiasm and interest through voice and body language. Due to the introduction of a prop and age of the children, the teacher was conscious to keep the children engaged and to utilise the 'thinking time'. This is evidenced by the children as when questioned, all thought that the teacher did good listening. The teacher frequently gestured to the thinking-hats when asking questions to encourage extended answers.

All of the target children met and often exceeded their planned expectation; and produced good levels of work. Despite periodic distractions, the LA child was able to extend his justification for picking Mexico as his destination (Figure 7). The LA child stated that:

LA- *"I would go to Mexico because it is hot and I remember that it is somewhere my mammy wants to go, she could come too!"*

All of the target children were able to give good justifications and extend their reasoning; this challenged the teachers' expectation and indicates that 'thinking time' is useful for all ability groups and by signifying its importance by using a physical gesture of hats, participants responses have developed.



Figure 5 - HA work, School 2 (White, 2018)

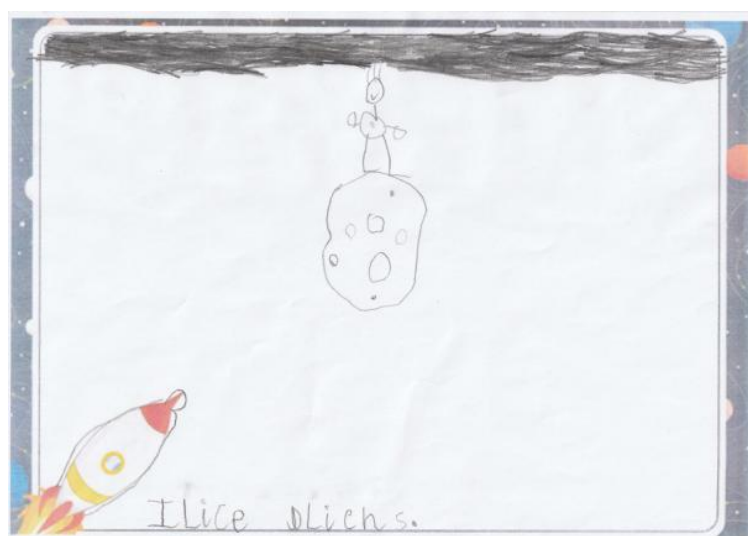


Figure 6 - MA work, School 2 (White, 2018)



Figure 7 - LA work, School 2 (White, 2018)

There were a number of useful revelations that occurred in the second research lesson due to changes implemented after reflection from the first research lesson. There appeared to be less disparity in the production of work between ability groups and a productive use of 'thinking time', due to the use of 'thinking-hats' and more specific questioning. Despite the periodic distractions of the LA pupil, overall concentration and engagement was better, visible through the quality and relevance of answers and positive body language displayed by the children. The teachers' prior knowledge has inferred that the level of response given by the children has exceeded expectations, suggesting that 'thinking time' has been utilised.

However, there are elements that could be improved for future use. During the focus group, the HA pupil suggested that the teacher should wear a thinking-hat in order to do "*good thinking like us* (participants)". This identifies the importance of the teachers' engagement with the 'thinking time', as previously inferred with the use of engaging teacher body language.

Through the completion of two research lessons in contrasting school environments, our research suggests that an engaging teacher that gives children 'thinking time' of three seconds, with a physical prop for concentration, can develop pupils of all abilities response to the learning outcome and extend their answers.

Relationship between Research Findings and Academic Literature

The findings of this research project have produced many parallels with the existing literature previously discussed. Much literature has suggested that extending 'thinking time' to three seconds results in fewer "I don't know" responses and more extended responses with quality of justification (Rowe, 1972). This has been echoed throughout ones research as all children were able to produce relevant responses, of different quality, and teachers' expectations were challenged by the increase of extended responses.

In accordance with Kirton et.al. (2007), but in contradiction to popular belief, once engaged through the use of thinking-hats, lower ability children produced relevant responses and a good standard of work that did not differ greatly from their 'more able' peers, despite some distraction. Both researchers experienced children exceeding preconceived expectations as they were given more time to process their thoughts (Ingram & Elliott, 2015).

Evident in the reviewed literature is this positive effect that 'thinking time' has upon the teacher as well as the student (Rowe 1986 and Ingram & Elliott, 2015). The positive effect and role of the teachers has been deemed vital in this research as teachers use the 'thinking time' to create personalised questions and to engage children, with their positive body language and to form high-end responses and challenging questions throughout the learning.

An element of one's research findings that challenges and builds upon current literature is the extension of gestures to the use of an actual physical prop. The significance of the four elements of body language as conceptualised by Yang (2016) appeared to have a profound effect upon 'thinking time'. Teachers utilised eye contact, posture, facial expression and gesture to engage the children, who all agreed that good listening occurred. However, subsequent to reflection of the use of body language, the use of a physical thinking-hat, in place of a gestured thinking cap, engaged participants to a larger extent; evidenced by the work produced and positive body language displayed by the children in the second lesson. The hats highlighted the importance of higher level thinking during the tasks and the children found them exciting.

While the findings of this research are in accordance with much literature, there are elements of this research project that may limit the validity. The chosen methodology provided much useful information for analysis; however, our findings could be further legitimised if all elements of Dudley's (2011) LS were adhered to. Dudley (2011) advocates the teaching of three or more research lessons, in the same school, in order to refine an element of pedagogy. Due to the constraints of the research assignment, this was not possible. The research was completed in a pair, meaning that our conclusions are deduced from the refining of one lesson, which may alter reliability. The lessons were completed with different groups of children, in schools of contrasting geography and context, who work at different levels and ability. More direct comparisons could be made if research were to be conducted and repeated with the same children (Dudley, 2011)

Despite these limitations, the participants were of a similar age and work through the same curriculum, allowing relevance of comparison. Therefore, our research signifies that by allowing three seconds of 'thinking time', children of all abilities can produce a relevant and extended response (related to their ability level) to questions, when the importance of the 'thinking time' is signified by an engaging teacher with positive body language, and the wearing of thinking-hats.

Conclusions and Recommendations

Through the completion of research in two contrasting school environments, adhering to

elements of Peter Dudley (2011) 'Lesson Study', this research implies that by giving three seconds of 'thinking time' and drawing attention to the importance of higher order thinking by utilising engaging teachers with positive body language and challenging questions, and the use of a prop (thinking-hat), then children of all abilities are able to extend answers, to different degrees, and develop reasoning.

The importance of developing higher-order thinking is demonstrated by Donaldson (2015), who suggests that good pedagogy should promote the full use of wider skills across all areas of 'Learning and Experience' in the Welsh curriculum. One of the wider skills promoted in the curriculum is the growth of critical thinking in our children in order for them to "develop deep conceptual understanding and transfer knowledge and skills to new situations to solve complex problems in a creative way" (Donaldson 2015:65). The importance of higher order thinking is echoed throughout Donaldson's recommendations for the Welsh curriculum and will have a profound effect upon the pedagogy of teachers in Wales. The use of 'thinking time' is a tool that can develop children's thinking skills, allowing them to become "ambitious, capable learners, ready to learn throughout their lives", (2015:113) as advocated by Donaldson.

Yet another implication of the benefits of 'thinking time' could extend to raising attainment levels as lower ability children included in the study who were given 'thinking time', were able to produce extended answers in comparison to their normal performance (according to the prior knowledge of the researchers). The schools included in this study had a difference of 27% of Free School Meals (FSM) eligibility and according to Cook et.al (2014:24) "Pupils eligible for FSM have, on average, lower attainment than other pupils throughout their progression in the education system in Wales". However, there proved to be little difference between the output of children of different abilities or from different schools. This suggests that the development of higher-order thinking can be beneficial to all children, in all locations.

Notwithstanding the identified benefits of 'thinking time' and its importance within a Welsh context, there are numerous possible improvements to be made if this research were conducted again. One would adhere fully to Dudley's (2011) 'Lesson Study' methodology, and research would be completed in the same school, with the same children if possible.

One would also consider the possible impact of peer interaction within 'thinking time' as ideas may have been shared and extended between friends.

Nonetheless, the conclusions and identified importance of 'thinking time' provide useful recommendations for teachers in Welsh schools and beyond. Therefore, this study would recommend:

- The adoption of a 'thinking time' culture in school, with a minimum of three seconds given for pupils to respond.
- The positive and enthusiastic use of body language (according to Yang, 2016) by teachers, to keep the children engaged.
- The use of a physical thinking-hat to illustrate the importance of concentration and higher-order thinking

As a collective, the children in the study challenged the teacher's preconceptions of standards of response. There was a slight lack of concentration exhibited by some lower ability pupils but the researchers would suggest that if a culture of 'thinking time' was implemented in the schools, then the children would be aware of expectations.

While keeping eye contact and appearing enthused with their body, it is imperative that the teacher commands the 'thinking time' and is able to hold the attention of all pupils and think of relevant questions, in order to utilize the time properly for children to think critically.

The employment of a thinking-hat allows the children to focus their attention upon extending their thought as they are aware that the teacher is going to ask difficult questions and that they have time to create a 'full-bodied' answer. The researchers would suggest that after 'thinking time' has been implemented effectively, props will not always be necessary as children become accustomed to the process.

Crucially, one understands that these recommendations are not innovative individually. The innovation lies with the integration of literature in the formation of these recommendations that must be implemented together for 'thinking time' to be a useful pedagogical tool to extend pupil response and encourage critical thinking.

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Appendices

Appendix 1 - School 1 Lesson Plan

Name of Trainee: 	Session ref: <u>TET – School 1 – Lesson Study</u>	Date: <u>27/03/2018</u>	Class: <u>1G</u>	Foundation Phase Focus Plan 2d  Canolfan Addysg Athrawon De-Orllewin Cymru The South West Wales Centre of Teacher Education
Personal Training Target(s):		Number of Learners: <u>29</u>	Age: <u>5-6 year olds</u>	
Learning objectives/intentions: To think critically and ask questions in relation to a story.		Success Criteria: I can retell elements of the story. I can answer questions about the story and give reasons for my answers. I can make a prediction about the story. I can ask a question about the story.		Meeting learners' needs: Child 1AC / Child 1U / Child 1E – EAL – visual aids and additional support from adults Child 1AB / Child 1L – SEN – additional support from adults
Introduction/plenary tasks	Main activities	Resources/Key Vocabulary	Assessment for Learning (strategies and opportunities)	
Introduction Read Explanatory statement to children and gain assent. Record assent. Read through the story. Explain task and send children to sit on their handwriting tables. Plenary Celebrate the children's work. What have they drawn and written about their mission? Why did they choose to go there on their mission? Focus group interview to follow after the lesson.	Whole Class Activity (Supporting adults to be spread out across all of the tables to support the children) Children to draw a picture to represent a place they would like to go on a mission. HA – To write a sentence about where they are going and what they can see? Grwp Gwyrdd / Grwp Melyn MA – To add some words/sentences to their drawing. Grwp Glas LA – draw a picture of a place they would go and label it with some words Grwp Coch	Resources Back to Earth with a Bump PowerPoint Plain A4 paper Pencils Rubber Colouring pencils	Questioning Before reading: What do you think this story could be about? After Slide 4: Where do you think Hal could be going? After Slide 7: Where do we think the Sun might have disappeared to? After Slide 10: What's our Planet called again? After Slide 12: What do you think Hal can see? After the book: If you had your own rocket, where would you go on your mission? What would you see?	
			Look for the language children are using when creating their own picture of where they would like to go? Can the children convey where they would like to go and why?	
Curriculum Coverage (range and skills) STRAND: Oracy, ELEMENT: Developing and presenting information and ideas, ASPECT: Speaking Speak audibly, conveying meaning to listeners beyond their friendship. Include some details and some relevant vocabulary to extend their ideas or accounts. STRAND: Oracy, ELEMENT: Developing and presenting information and ideas, ASPECT: Listening Listen to others, with growing attention, usually responding appropriately, e.g. <i>carrying out instructions</i> . Show understanding of what they have heard by asking questions to find out more information.				
Literacy (LNF) STRAND: Oracy, ELEMENT: Developing and presenting information and ideas, ASPECT: Speaking Speak audibly, conveying meaning to listeners beyond their friendship. Include some details and some relevant vocabulary to extend their ideas or accounts. STRAND: Oracy, ELEMENT: Developing and presenting information and ideas, ASPECT: Listening Listen to others, with growing attention, usually responding appropriately, e.g. <i>carrying out instructions</i> . Show understanding of what they have heard by asking questions to find out more information.		Numeracy (LNF) N/A		
DCF Story on PowerPoint on IWB. Pupils to follow text, illustrations.	Thinking Asking Questions – ask relevant questions and begin to link questions into sequences. Give reasons for choice of questions. Generating and Developing Ideas – generate imaginative ideas and possibilities. Reviewing the Process / Method – show or describe some of what has been done, identify, in response to questions, what worked and what didn't.	ESDGC Understanding our relation on Earth Where we are in the Solar System	YCC NASA Control in North Wales	

Appendix 2 - School 2 Lesson Plan

Name of Trainee: [REDACTED]	Session ref: TET – School 2 – Lesson Study	Date: 28/03/2018	Class: Reception - T	Foundation Phase Focus Plan 2d  Canolfan Addysg Athrawon De-Orllewin Cymru The South West Wales Centre of Teacher Education
Personal Training Target(s):		Number of Learners: 29	Age: 4- 5 year olds	
Learning objectives/intentions: To think critically and ask questions in relation to a story.		Success Criteria: I can retell elements of the story. I can answer questions about the story and give reasons for my answers. I can make a prediction about the story. I can ask a question about the story.	Meeting learners' needs: Child 2Y – SEN – visual aids and additional support from adults Child 2J, 2U, 2W, 2AB – SEN – additional support from adults	
Introduction/plenary tasks	Main activities		Resources/Key Vocabulary	Assessment for Learning (strategies and opportunities)
Introduction Read Explanatory statement to children and gain assent. Record assent Introduce thinking hats Read through the story and ask questions. Explain task and send children to sit on their handwriting tables. Plenary Celebrate the children's work. What have they drawn and written about their mission? Why did they choose to go there on their mission? Focus group interview to follow after the lesson	Whole Class Activity (Supporting adults to be spread out across all of the tables to support the children) Children to draw a picture to represent a place they would like to go on a mission. Discussion and asking questions while they are drawing HA – To write a sentence about where they are going and what they can see? Green Group MA – To add some words/sentences to their drawing. Orange Group and Yellow Group LA – draw a picture of a place they would go and label it with some words Red Group		Resources Back to Earth with a Bump PowerPoint Plain A4 paper Pencils Rubber Colouring pencils Thinking Hats	Questioning Before reading: What do you think this story could be about? Asking questions where appropriate and extend-follow on from their answers. After the book: If you had your own rocket, where would you go on your mission? What would you see? Look for the language children are using when creating their own picture of where they would like to go? Can the children convey where they would like to go and why ?
Curriculum Coverage (range and skills) STRAND: Oracy, ELEMENT: Developing and presenting information and ideas, ASPECT: Speaking Speak audibly, conveying meaning to listeners beyond their friendship. Include some details and some relevant vocabulary to extend their ideas or accounts. STRAND: Oracy, ELEMENT: Developing and presenting information and ideas, ASPECT: Listening Listen to others, with growing attention, usually responding appropriately, e.g. <i>carrying out instructions</i> . Show understanding of what they have heard by asking questions to find out more information.				
Literacy (LNF) STRAND: Oracy, ELEMENT: Developing and presenting information and ideas, ASPECT: Speaking Speak audibly, conveying meaning to listeners beyond their friendship. Include some details and some relevant vocabulary to extend their ideas or accounts. STRAND: Oracy, ELEMENT: Developing and presenting information and ideas, ASPECT: Listening Listen to others, with growing attention, usually responding appropriately, e.g. <i>carrying out instructions</i> . Show understanding of what they have heard by asking questions to find out more information.		Numeracy (LNF) N/A		
DCF Story on PowerPoint on IWB. Pupils to follow text, illustrations.	Thinking Asking Questions – ask relevant questions and begin to link questions into sequences. Give reasons for choice of questions. Generating and Developing Ideas – generate imaginative ideas and possibilities. Reviewing the Process / Method – show or describe some of what has been done; identify, in response to questions, what worked and what didn't.		ESDGC Understanding our relation on Earth Where we are in the Solar System	YCC NASA Control in North Wales

Appendix 3 - Observation Schedule for School 1

Observational Schedule

School 1

Date of Observation:	Tuesday 27 March 2018
Lesson / Subject:	Literacy – Back to Earth with a Bump
Time:	10:30am – 11:45am
What are the learners expected to do?	Listen to the story, answering questions throughout and predicting events. Draw a picture of a place they would like to go to on their mission. Think about where they would go and what would they see. Opportunity to write a sentence to accompany their picture.
Think time given:	Thinking time – a minimum of 3 seconds given. Teacher responded to individual needs and selected a mixture of children with their hands up and down.
Learners' response to task:	All participants drew a picture – everyone was engaged and excited to complete the task. HA – took more time with their pictures and made good and mostly accurate predictions during the story. They thought of more interesting places and used their imagination. MA – more prompts needed when discussing their picture LA – their pictures were more based on elements from the story.
Teacher's body language:	Consistent, open, Facing the class with interested expression. Encouraging but not rushing when giving participants their thinking time.

Additional Comments	LA – more fussing on the carpet. Not necessarily using thinking time appropriately. Pace was slower because of increased thinking time. More prompting for LA during thinking time. HA – applied prior knowledge and concepts of the world they knew to the story. More advanced and imaginative ideas. MA/LA – more book based and isolated prior knowledge and concepts. Not understanding or making links between concepts.
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Focused Pupils

Pupil 1 – Child 10 – HA

Very talkative

Didn't always use thinking time, quick to respond to questions.

Keen to respond to all questions

Gave reasonable answers to questions – used sentences to give opinions and to share ideas and not one-word answers

Enjoyed the task and gave thumbs up

Pupil 2 – Child 1Q – MA

Enjoyed the task – would have liked more specific questioning

Didn't look like he engaged with thinking time as much as he could.

Pupil 3 – Child 1AA – LA

Would have liked more thinking time and would have like a prop to visualise the thinking time. A prop like a hat.

Interview

1. What did you think about our learning today?

Pupil 1/Pupil 2/Pupil 3 all responded by putting their thumbs up.

Teacher: *"Why?"*

Pupil 1: *"liked listening to the story and drawing our places where we would go"*

Pupil 2: *"easy"*

Pupil 3: *"challenging"*

2. Think back to the lesson, what do you remember that helped us with our thinking?

Pupil 1: *"we put our hand on our head when it was time to think"*

Pupil 2: *"the story"*

Pupil 3: demonstrated the action of putting his hand on his head

3. Do you think I did good listening? Why?

Pupil 1: *"Yes, you did"*

Pupil 2: *"Yes"*

Pupil 3: *"Yes"*

4. Did you have enough time to think?

Pupil 1: *"Yes"*

Pupil 2: *"Yes"*

Pupil 3: *"More time"*

5. What could I do to make it better?

Pupil 1: *"I would like to have talked to my partner, so that we could share ideas and help each other"*

Pupil 2: *"harder questions"*

Pupil 3: *"I would like a thinking hat"*

Pupil 1, 2 and 3 all commented that they would have liked to have shared their thinking time with a partner.

Appendix 4 - Observation Schedule for School 2

Observational Schedule

School 2

Date of Observation:	Wednesday 28 March 2018
Lesson / Subject:	Literacy – Back to Earth with a Bump
Time:	1.30pm – 2.30pm
What are the learners expected to do?	Listen to the story, answering questions throughout and predicting events. Draw a picture of a place they would like to go to on their mission. Think about where they would go and what would they see. Opportunity to write a sentence to accompany their picture. Use the thinking caps prop to enhance their thinking time.
Think time given:	Thinking time – a minimum of 3 seconds given. Teacher responded to individual needs and selected a mixture of children with their hands up and down.
Learners' response to task:	All participants drew a picture – everyone was engaged and excited to complete the task. Answered questions and “played” along with the thinking cap prop. Seemed to like the prop. Used their imagination. Activated prior knowledge to help answer the questions around the book.
Teacher's body language:	Consistent, open, Facing the class with interested expression and good use of voice.
Additional Comments	Treated the prop as an “on/off” switch. One believed that it wasn't working so rubbed it to make it work again. Good use of

	imagination. HA – took more time with their pictures and made good and mostly accurate predictions during the story. Thinking cap did not distract them. MA – engaged in task. Thinking cap did not distract them. LA – distracted by thinking cap – spent a lot of time playing with it. Children were excited to see the teacher which meant they were quite distracted generally.
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Focused Pupils

Pupil 1 – Child 2P – HA

Very talkative to the teacher – engaged with the lesson and the thinking hats.

Keen to respond to all questions

Good imagination around the thinking hat prop.

Pupil 2 – Child 2D – MA

Very quiet throughout. Engaged within tasks and answered questions when asked. Seemed to engage with the thinking hat prop and used his imagination.

Pupil 3 – Child 2K – LA

Playing with hat at times outside of the think time given.

Limited responses given at times.

HA: *“These thinking hats are really good”*

Teacher: *“Give it a rub...”*

Pupil HA: *“That’s why it is not working...”*

Teacher: *“Could you think better with the thinking hats on or off?”*

HA: *“Off”*

Teacher: *"Why?"*

HA: *"They were a bit distracting"*

Teacher: *"Do you think the thinking hats helped you to concentrate?"*

HA: *"Yes..."*

MA: *"Yes..."*

LA: *"Yes..."*

Interview

1. What did you think about our learning today?

Pupil 3: *"Awesome, made us think about Mexico..."*

Pupil 2: *"Good, I liked my thinking hat..."*

Pupil 1: *"I liked writing and the thinking hat helped me to concentrate"*

2. Think back to the lesson, what do you remember that helped us with our thinking?

Pupil 3: *"Hats!"*

Pupil 2: *"Hats!"*

Pupil 1: *"Hats!"*

3. Do you think I did good listening?

All: *"Yes"*

4. Did you have enough time to think?

Pupil 1: *"Yes"*

Pupil 2: *"Yes"*

Pupil 3: *"More time"*

5. What could I do to make it better?

Pupil 1: *"Make a hat, you [teacher] put one on too!"*

Pupil 2: *"It was good"*

Appendix 5 - Assent and Consent in School 1

School 1 Assent				
Pupil Reference	Name of Pupil	Parental Consent	Assent (Thumbs up)	Ongoing Assent
1A	████	✓	✓	
1B	████	✓	✓	
1C	████	✓		ABSENT FOR RESEARCH
1D	████	✓	✓	
1E	████	✓	✓	
1F	████	✓	✓	
1G	██	✓	✓	
1H	████	✓	✓	
1I	████	✓	✓	
1J	████	✓	✓	
1K	██████	✓	✓	
1L	████	✓	✓	
1M	████	✓	✓	
1N	████	✓	✓	
1O	████	✓	✓	
1P	████	✓	✓	
1Q	████	✓	✓	
1R	████	✓		ABSENT FOR RESEARCH
1S	████	x		
1T	████	✓	✓	
1U	██████	✓	✓	
1V	████	✓	✓	
1W	████	✓		ABSENT FOR RESEARCH
1X	████	✓	✓	
1Y	████	✓	✓	
1Z	████	✓	✓	
1AA	████	✓	✓	
1AB	████	✓	✓	
1AC	████	✓		ABSENT FOR RESEARCH

(Names Anonymised)

Appendix 6 - Assent and Consent in School 2

School 2 Assent				
Pupil Reference	Name of Pupil	Parental Consent	Assent (Thumbs up)	Ongoing Assent
2A		✓	✓	
2B		✓		Absent for research
2C		✓	✓	
2D		✓	✓	
2E		✓	✓	
2F		x		
2G		✓	✓	
2H		✓	✓	
2I		✓	✓	
2J		✓	✓	
2K		✓	✓	
2L		✓		Absent for research
2M		✓		Absent for research
2N		✓	✓	
2O		✓	✓	
2P		✓	✓	
2Q		✓	✓	
2R		✓	✓	
2S		✓	✓	
2T		✓	✓	
2U		✓	✓	
2V		✓	✓	
2W		✓	✓	
2X		✓	✓	
2Y		✓	✓	
2Z		✓	✓	
2AA		✓	✓	
2AB		✓	✓	
2AC		x		

Appendix 7 - School 1 Explanatory Statement

Dawn Kimberley Hooper
Student Number: 1701011
Group 3

Explanatory Statement School 1

Today, you may have noticed that there is another adult in the room who you have not met before. This is Miss White and she has heard that you are such good learners with excellent behaviour, so she has come to watch our learning today.

Miss White has a special research mission and is going to be making some notes whilst watching and will be chatting to children who have shown her good learning. This is going help make our learning even better than it is already.

To help Miss White with her mission today, we are going to be thinking about how we think. We have got some fun activities for us to take part in.

Nobody's names will be mentioned after this lesson and Mrs Guy and Mr Thompson will be able to look at the results of the mission.

Everybody is coming on our mission, but before we start, I would like to see who is willing to be involved. If you're ready for take-off, close your eyes and put your thumbs up. If you are unsure, put your finger on your nose and we can have a little chat. If at any point during Miss White's mission, you're worried or upset, please make sure you tell a teacher.

Witness Statement

I can confirm that this explanatory statement was read out to the class and assent was gained and recorded from the pupils before the research commenced.

Signature: 
Date: 27.3.18

Appendix 8 - School 2 Explanatory Statement

Rebecca Elizabeth White
Student Number: 1700141
Group 3

Explanatory Statement School 2

Today, you may have noticed that there is another adult in the room who you have not met before. This is Miss Hooper and she has heard that you are such good learners with excellent behaviour, so she has come to watch our learning today.

Miss Hooper has a special research mission and is going to be making some notes whilst watching and will be chatting to children who have shown her good learning. This is going to help make our learning even better than it is already.

To help Miss Hooper with her mission today, we are going to be thinking about how we think. We have got some fun activities for us to take part in.

Nobody's names will be mentioned after this lesson and Mrs Taylor and Mr Dywer will be able to look at the results of the mission.

Everybody is coming on our mission, but before we start, I would like to see who is willing to be involved. If you're ready for take-off, close your eyes and put your thumbs up. If you are unsure, put your finger on your nose and we can have a little chat. If at any point during Miss Hooper's mission, you're worried or upset, please make sure you tell a teacher.

Witness Statement

I can confirm that this explanatory statement was read out to the class and assent was gained and recorded from the pupils before the research commenced.

Signature: _____

RK Taylor

Date: _____

28.3.18

Appendix 9 - Ethics Form

APPLICATION FOR ETHICAL APPROVAL

In order for research to result in benefit and minimise risk of harm, it must be conducted ethically. A researcher may not be covered by the University's insurance if ethical approval has not been obtained prior to commencement.

The University follows the OECD Frascati manual definition of **research activity**: “creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications”. As such this covers activities undertaken by members of staff, postgraduate research students, and both taught postgraduate and undergraduate students working on dissertations/projects.

The individual undertaking the research activity is known as the “principal researcher”.

Ethical approval is not required for routine audits, performance reviews, quality assurance studies, testing within normal educational requirements, and literary or artistic criticism.

Please read the notes for guidance before completing ALL sections of the form.

This form must be completed and approved prior to undertaking any research activity. Please see Checklist for details of process for different categories of application.

SECTION A: About You (Principal Researcher)

Full Name:	Rebecca Elizabeth White				
Tick all boxes which apply:					
Member of staff:	☐	Student:	☒	Honorary research fellow:	☐

Faculty/School/Centre:	Yr Athrofa
Campus:	Townhill
E-mail address:	1700141@student.uwtsd.ac.uk

Contact Telephone Number:	07772143936		
For students:			
Student Number:	1700141	Undergraduate	☐
Programme of Study:	PGCE Primary	Taught Postgraduate	X
Director of Studies/Supervisor:	Dr C. J. Lewis	Research	☐

SECTION B: Approval for Research Activity

Has the research activity received approval in principle? (please check the Guidance Notes as to the appropriate approval process for different levels of research by different categories of individual)		YES	X	NO	☐
					Date
If Yes, please indicate source of approval (and date where known):	Research Degrees Committee		☐		
	Faculty Research Committee		☐		
	Other (write in) Dr C.J. Lewis		X	28/02/18	

Approval in principle **must** be obtained from the relevant source prior to seeking ethical approval.

SECTION C: External Ethical Guidance Materials

Please list the core ethical guidance documents that have been referred to during the completion of this form (including any discipline-specific codes of research ethics, and also any specific ethical guidance relating to the proposed methodology). Please tick to confirm that your research proposal adheres to these codes and guidelines.	
British Education Research Association Ethical Guidelines (2011)	X
UWTSD Research Ethics & Integrity Code of Practice Guidelines (2017)	X
Education Workforce Council Code of Practice (2017)	X

SECTION D: External Collaborative Research Activity

Does the research activity involve collaborators outside of the University?	YES	☐	NO	☒
If Yes, please provide the name of the external organisation and name and contact details for the main contact person:				
Institution				
Contact person name				
Contact person e-mail address				

Where research activity is carried out in collaboration with an external organisation

Does this organisation have its own ethics approval system?	YES	☐	NO	☐
If Yes, please attach a copy of any final approval (or interim approval) from the organisation				

SECTION E: Details of Research Activity

Indicative title:	How can thinking time develop pupil response to the learning outcome?		
Proposed start date:	March 2018	Proposed end date:	April 2018
Purpose of research activity (including aims and objectives) Outline the purpose, aims and objectives of the research activity, including key research questions. Show briefly how existing research has informed the proposed activity and explain what the research activity will add and how it addresses an area of importance. (Maximum 300 words)			
The purpose of the research is to investigate if giving pupils thinking time encourages them to respond to the teacher. On average, teachers only wait between 0.7 and 1.4 seconds for an answer to a question before repeating the question or rewording it (Stahl, 1994). Children don't necessarily have enough time to process the question and respond to the best of their ability. Therefore this research aims to examine the consequences of giving children enough time to reply, without probing them, to hopefully encourage response. There are 3 main aims of this research that will later influence the composition of research questions. The first aim regards the need for a longer length of thinking time as suggested by Mary Bud Rowe in			

her 1972 paper (from five years of study) regarding thinking (wait) time. Rowe (1972) observed that when teachers allowed at least 3 seconds of thinking time, more class members will get involved, with better quality answers and students are more likely to ask their own questions. This project aims to investigate the quality of response of the foundation phase children, when given sufficient time. The second aim of this research involves the importance of teacher's body language during the children's thinking time. According to Yang (2016), body language, especially for younger children, provides 'image communication' that allows teachers to further whatever it is they are saying and it engages the children to the task in hand. If a teacher expresses negative body language, younger children are likely to imitate such behaviour, which may disengage them during thinking time. This research will investigate the impact of positive body language during thinking time. The final aim regards the use of visual gestures in engaging children in the thinking time process. Arntsen (2017) suggests that students become accustomed to gestures and they can reinforce routine. We intend to investigate if gestures formalise the use of thinking time and help the children to stay engaged.

We have formulated three key questions from these aims;

1. How can a longer period of thinking time develop pupil response?
2. How can a teacher's body language impact the response given by children during thinking time?
3. How can visual gestures engage the pupils in the thinking time process?

Proposed methods

Provide a brief summary of all the methods that **may** be used in the research activity, making it clear what specific techniques may be used. If methods other than those listed in this section are deemed appropriate later, additional ethical approval for those methods will be needed.

The main method of this research activity is 'Lesson Study', as outlined by Peter Dudley (2011). This involves the collaboration of teachers in planning, teaching, observation and analysis of research lessons, with the aim of refining an element of pedagogy. During the process, more specific forms of methodology will be adopted such as the use of case pupils, joint semi structured observations, focus groups and reflection.

The aim of the taught lessons (as outlined above) is to explore the relationship between 'thinking time' (Rowe, 1972) and child response. Lessons will be jointly planned in regard to this aim and will be jointly observed through note taking and using an 'observation sheet' (in accordance with Dudley, 2011). The term semi structured has been used due to the use of many pre-determined elements, but flexibility will be used to allow for responses to be explored. These observations will involve the whole class (consented/assented), but mainly preselected case pupils.

There will be three case/target pupils in each lesson, one from each ability group, chosen at random. In the event of 'contingency' another pupil that has gained informed consent and assented will be chosen at random from the relevant ability group (outlined in Section G) (Dudley, 2011).

After both research lessons, a focus group style interview will be conducted with case pupils. There will be predetermined questions, but participants will be encouraged to talk freely for a short period of time (5-10 minutes). Dudley (2011) suggests that at this point pupils begin to take 'ownership' of the

whole learning process and are given a voice .

After each research lesson, my research partner and I will discuss and reflect upon the observations made. These discussions will provide points for improvement and information for further analysis. The focus group will be sound recorded in order to improve reflection. Recording will be completely anonymous as no names or identifiable features will be used. Any recordings will be archived after the completion of research.

All ethical elements have been discussed, and the previously listed ethical guidance documents have been considered.

Location of research activity Identify all locations where research activity will take place.
School 1 is situated in the centre of Bridgend. There are 437 pupils on roll, including 58 in the school's nursery class. Pupils are organised into 15 classes. Around 8% of pupils are eligible for free school meals and very few pupils are looked after by the local authority (Estyn, 2017). School 2 is a primary school in the east of Swansea. There are 353 pupils aged three to eleven years on roll. This includes around 53 pupils in the two part-time nursery classes. The school has 12 full-time classes. Two classes have pupils from mixed age groups. Around 35% of pupils are eligible for free school meals and there are a very few children who are looked after by the local authority (Estyn, 2014).
Research activity outside of the UK If research activity will take place overseas, you are responsible for ensuring that local ethical considerations are complied with and that the relevant permissions are sought. Specify any local guidelines (e.g. from local professional associations/learned societies/universities) that exist and whether these involve any ethical stipulations beyond those usual in the UK (provide details of any licenses or permissions required). Also specify whether there are any specific ethical issues raised by the local context in which the research activity is taking place, for example, particular cultural sensitivities or vulnerabilities of participants.
N/A (this box should expand as you type)

SECTION F: Scope of Research Activity

Will the research activity include:	YES	NO
Use of a questionnaire or similar research instrument?	☐	X
Use of interviews? (Focus Group)	X	☐
Use of diaries?	☐	X
Participant observation with their knowledge?	X	☐
Participant observation without their knowledge?	☐	X

Use of video or audio recording?	Decided against due to ethical implications and time	X	☐
Access to personal or confidential information without the participants' specific consent?		☐	X
Administration of any questions, test stimuli, presentation that may be experienced as physically, mentally or emotionally harmful / offensive?		☐	X
Performance of any acts which may cause embarrassment or affect self-esteem?		☐	X
Investigation of participants involved in illegal activities?		☐	X
Use of procedures that involve deception?		☐	X
Administration of any substance, agent or placebo?		☐	X
Working with live vertebrate animals?		☐	X
Other primary data collection methods, please explain in this box		☐	X

If NO to every question, then the research activity is (ethically) low risk and **may** be exempt from **some** of the following sections (please refer to Guidance Notes).

If YES to any question, then no research activity should be undertaken until full ethical approval has been obtained.

SECTION G: Intended Participants

Who are the intended participants:	YES	NO
Students or staff at the University?	☐	☐
Adults (over the age of 18 and competent to give consent)?	☐	X
Vulnerable adults?	☐	X
Children under 18?	X	☐
Prisoners?	☐	X
Young offenders?	☐	X

Those who could be considered to have a particularly dependent relationship with the investigator or a gatekeeper?	☐	X
People engaged in illegal activities?	☐	X
Others (please identify):	☐	X

Participant numbers and source

Provide an estimate of the expected number of participants. How will you identify participants and how will they be recruited?

The age range of the participants in this project are children aged 4-6. Research in School 1 will be conducted in a Year One class, and research in School 2 will be conducted in a Reception class. Both classes have 29 children. We intend to have 3 target pupils in each class. We will randomly (from a hat) choose 1 pupil from each ability group (one higher ability, one middle ability and one lower ability). In the event of absence, a new name will be randomly drawn. The only children that can be randomly drawn are children who have given assent, show ongoing assent and children who have gained informed consent from parents.

Information for participants:	YES	NO	N/A
Will you describe the main research procedures to participants in advance, so that they are informed about what to expect?	X	☐	☐
Will you tell participants that their participation is voluntary?	X	☐	☐
Will you obtain written consent for participation?	X	☐	☐
Will you explain to participants that refusal to participate in the research will not affect their treatment or education (if relevant)?	X	☐	☐
If the research is observational, will you ask participants for their consent to being observed?	X	☐	☐
Will you tell participants that they may withdraw from the research at any time and for any reason?	X	☐	☐
With questionnaires, will you give participants the option of omitting questions they do not want to answer?	☐	☐	X
Will you tell participants that their data will be treated with full confidentiality and that, if published, it will not be identifiable as	X	☐	☐

theirs?			
Will you debrief participants at the end of their participation, in a way appropriate to the type of research undertaken?	X	☐	☐
If NO to any of above questions, please give an explanation			

Information for participants:	YES	NO	N/A
Will participants be paid?	☐	X	☐
Is specialist electrical or other equipment to be used with participants?	☐	X	☐
Are there any financial or other interests to the investigator or University arising from this study?	☐	X	☐
Will the research activity involve deliberately misleading participants in any way, or the partial or full concealment of the specific study aims?	☐	X	☐
If YES to any question, please provide full details			
(this box should expand as you type)			

SECTION H: Anticipated Risks

Outline any anticipated risks that may adversely affect any of the participants, the researchers and/or the University, and the steps that will be taken to address them.

If you have completed a full risk assessment (for example as required by a laboratory, or external research collaborator) you may append that to this form.

Full risk assessment completed and appended?

Yes ☐

No ☒

Risks to participants

For example: emotional distress, financial disclosure, physical harm, transfer of personal data, sensitive organisational information

I will adhere to the Safeguarding and Risk processes of School 1 and School 2 (available online if requested), while also being mindful of university guidelines (Sections 7 and 9 of the "Research, Ethics & Integrity Code of Practice" (2017-2020) BERA and EWC.

In adhering to these guidelines, no child will be treated differently if they decide that they do not want to take part in the investigation.

If research activity may include sensitive, embarrassing or upsetting topics (e.g. sexual activity, drug use) or issues likely to disclose information requiring further action (e.g. criminal activity), give details of the procedures to deal with these issues, including any support/advice (e.g. helpline numbers) to be offered to participants. Note that where applicable, consent procedures should make it clear that if something potentially or actually illegal is discovered in the course of a project, it may need to be disclosed to the proper authorities

N/A

Risks to investigator			
For example: personal safety, physical harm, emotional distress, risk of accusation of harm/impropriety, conflict of interest			
The observations will take place in the usual classrooms of the pupils from School 1 and School 2. There will be a number of adults present at all times during the investigation; including the class teacher, additional teaching assistants, my research partner and I. At all times there will be a member of staff from the school in question present (with both researchers). These measures should prevent the risk of accusation and satisfy required child to adult ratios. Investigators will have a valid DBS certificate on their person to be viewed upon request.			
University/institutional risks			
For example: adverse publicity, financial loss, data protection			
Both researchers will show complete professionalism and adhere to safeguarding, behaviour, risk and data protection policies. One will be mindful of the university's reputation throughout all aspects of research. One will ensure that the important partnership between schools and the university is considered and any research actions will not be detrimental. To ensure the preservation of school relationships and university reputations, all data will be protected and no data will be falsified.			
Adverse outcomes			
List measures put in place to limit any adverse effects or outcomes of research activity where appropriate. Include any emergency protocols.			
Both safeguarding and health and safety policies will be adhered and accessed prior to investigation. Research partners will also make the other aware of fire routes and protocol prior to investigation. All university guidelines regarding adverse effects will be considered (Section 7 of UWTSD Research ethics policy).			

Disclosure and Barring Service			
If the research activity involves children or vulnerable adults, a Disclosure and Barring Service (DBS) certificate must be obtained before any contact with such participants.			
	YES	NO	N/A
Has a DBS certificate been obtained?	X	☐	☐

SECTION I: Feedback, Consent and Confidentiality

Feedback
What feedback will be provided to participants, how will this be done and when?
The completed investigation will be available to any schools involved in the research upon request. Feedback will also be given to the participants during the research.
Informed consent
Describe the arrangements to inform potential participants, before providing consent, of what is involved in participating. Describe the arrangements for participants to provide full consent before data collection begins. If gaining consent in this way is inappropriate, explain how consent will be obtained and recorded.
Prior to investigation, a letter will be sent to the guardians of the proposed participants to gain informed consent as the children are under 18. Upon meeting the children, a statement will be read out to inform them of the research process and their freedom to not participate or withdraw at any time. Much literature talks of the implications of consent when dealing with children. Therefore one will consider 'assent' and 'ongoing assent' whereby children's actions and body language are considered and if deemed 'negative', children are withdrawn from the process. The children will also be asked to give a 'thumbs up' if they give assent or to put their finger on their nose if they are unsure about anything. We can then identify any children who may not want to participate or those who have questions (University Guidelines 19.4).
Confidentiality / Anonymity
Set out how anonymity of participants and confidentiality will be ensured in any outputs. If anonymity is not being offered, explain why this is the case.
Anonymity will be given to all participants as they will be anonymised in any notes and quotations. Confidentiality will be given as only my research partner and I will have access to data. Any data will be encrypted and archived. All participants will be informed of such in an opening statement.

SECTION J: Data Protection and Storage

In completing this section refer to the University's Research Data Management Policy and the extensive resources on the University's Research Data Management web pages (<http://uwtsd.ac.uk/library/research-data-management/>).

	YES	NO
Does the research activity involve personal data (as defined by the Data Protection Act)? “personal data” means data which relate to a living individual who can be identified— (a) from those data, or (b) from those data and other information which is in the possession of, or is likely to come into the possession of, the data controller, and includes any expression of opinion about the individual and any indication of the intentions of the data controller or any other person in respect of the individual.	☐	x
If YES, provide a description of the data and explain why this data needs to be collected:		
Does it involve sensitive personal data (as defined by the Data Protection Act)? “Sensitive personal data” means personal data consisting of information as to – (a) the racial or ethnic origin of the data subject, (b) his political opinions, (c) his religious beliefs or other beliefs of a similar nature, (d) whether he is a member of a trade union (within the meaning of the Trade Union and Labour Relations (Consolidation) Act 1992), (e) his physical or mental health or condition, (f) his sexual life, (g) the commission or alleged commission by him of any offence, or (h) any proceedings for any offence committed or alleged to have been committed by him, the disposal of such proceedings or the sentence of any court in such proceedings.	☐	x
If YES, provide a description of the data and explain why this data needs to be collected:		
(this box should expand as you type)		

	YES	NO
Will the research activity involve storing personal data on one of the following:		

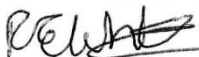
Manual files (i.e. in paper form)?	☐	x
University computers?	☐	x
Private company computers?	☐	x
Home or other personal computers?	☐	x
Laptop computers/ CDs/ Portable disk-drives/ memory sticks?	☐	x
“Cloud” storage or websites?	☐	x
Other – specify:	☐	x
For all stored data, explain the measures in place to ensure data confidentiality, including details of <u>password protection</u> , encryption and <u>anonymisation</u> :		
Personal data will not be stored - University guidelines regarding this have been considered (Section 19 of UWTSD Research Ethics& Integrity Code of Practice)		
Will the research activity involve any of the following activities:	YES	NO
Electronic transfer of data in any form?	☐	☐
Sharing of data with others at the University?	x	☐
Sharing of data with other organisations?	☐	x
Export of data outside the European Union or importing of data from outside the UK?	☐	x
Use of personal addresses, postcodes, faxes, emails or telephone numbers?	☐	x
Publication of data that might allow identification of individuals?	☐	x
Use of data management system?	☐	x
Data archiving?	x	☐
If YES to any question, please provide full details, explaining how this will be conducted in accordance with the Data Protection Act (and/or any international equivalent):		
Data will be archived on completion of this assignment. Any data from this investigation will be encrypted and password protected. I will adhere fully to the Data Protection Act and UWTSD policy.		

List all who will have access to the data generated by the research activity:
Myself (Rebecca White) and My research partner (Dawn Kimberly Hooper)
List who will have control of, and act as custodian(s) for, data generated by the research activity:
Myself (Rebecca White) and My research partner (Dawn Kimberly Hooper)
Give details of data storage arrangements, including where data will be stored, how long for, and in what form. Will data be archived – if so how and if not why not.
Data will temporarily exist on an encrypted and password protected USB. Data will be archived on completion of this assignment.

SECTION K: Declaration

The information which I have provided is correct and complete to the best of my knowledge. I have attempted to identify any risks and issues related to the research activity and acknowledge my obligations and the rights of the participants.

In submitting this application I hereby confirm that I undertake to ensure that the above named research activity will meet the University's [Research Ethics and Integrity Code of Practice](#)

Signature of applicant: R.E.White  **Date:** 26/02/18

For students:

Head teacher/ Senior Mentor:	MR RUSSELL DWYER
Signature:	
Date:	26/02/18

Supervisor:	Dr C.J. Lewis
Signature:	
Date:	28/02/18

Checklist: Please complete the checklist below to ensure that you have completed the form according to the guidelines and attached any required documentation:

☒	I have read the guidance notes supplied before completing the form.
☒	I have completed ALL RELEVANT sections of the form in full.
☒	I confirm that the research activity has received approval in principle
☐	I have attached a copy of final/interim approval from external organisation (where appropriate)
☐	I have attached a full risk assessment (and have NOT completed Section H of this form) (where appropriate)
☒	I understand that it is my responsibility to ensure that the above named research activity will meet the University's Research Ethics and Integrity Code of Practice.
☒	I understand that before commencing data collection all documents aimed at respondents (including information sheets, consent forms, questionnaires, interview schedules etc.) must be confirmed by the DoS/Supervisor, module tutor or Head of School.

RESEARCH STUDENTS AND STAFF ONLY

All communications relating to this application during its processing must be in writing and emailed to pgresearch@uwtsd.ac.uk, with the title 'Ethical Approval' followed by your name. You will be informed of the outcome of your claim by email; therefore it is important that you check your University and personal email accounts regularly.

STUDENTS ON UNDERGRADUATE OR TAUGHT MASTERS PROGRAMMES should submit this form (and receive the outcome) via systems explained to you by the supervisor/module leader.