How can having specific roles in collaborative learning groups improve pupil engagement and participation? A critical analysis of practitioner research using Lesson Study.

Aim, focus and purpose of the research

The aim, focus and purpose of this research project is to review the effect of the assessment for learning technique of collaborative learning and to measure the impact on pupil engagement and participation where pupils have specific roles in their collaborative groups. In addition, the research also seeks to review whether the quality of the collaborative learning taking place is improved by the allocation of specific roles.

Throughout Donaldson's Successful Futures Report (2015), reference is made to the need for pupils to be able to work collaboratively and so become enterprising, creative contributors. As such, this research area was of particular interest to myself and my partner. Furthermore, during my Professional Teaching Experience in the Year 4 class referred to below, I observed and also taught sessions where the pupils worked collaboratively to achieve the learning objectives set. In one particular session taught, the pupils were placed in collaborative learning groups where they were not assigned specific roles within the group. On reflection and after discussion with the class teacher, it was agreed that had the pupils been given specific roles, there would have potentially been an increase in their level of engagement and participation (Appendix 1). In contrast, I observed a lesson delivered by the class teacher where pupils were allocated roles within their collaborative learning groups such as 'organiser', 'scribe' and 'timekeeper' and in this lesson, the pupils were much more focussed and on task.

It therefore seemed appropriate that our research question should be 'how can having specific roles in collaborative learning groups improve pupil engagement and participation?'

Research Context

The first research lesson took place in a Year 4 class of 30 pupils in a large Junior School of approximately 360 pupils, situated in a designated community first town. Around 28% of pupils are eligible for free school meals and the school identifies about 35% of pupils as having additional learning needs (Estyn, 2017). The school has been categorised by Welsh Government as amber support.

The second research lesson took place in a Year 6 class of 30 pupils in a medium sized Primary School of approximately 260 pupils in a semi-rural location. Around 39% of pupils are eligible for free school meals and the school identifies about 29% of pupils as having additional learning needs (Estyn, 2012). The school has been categorised by Welsh Government as yellow support.

Whilst the two schools are different in terms of size and age ranges of pupils, there are similarities between the two schools with regards to the backgrounds of the pupils. Both schools are also above the Welsh percentage average for pupils eligible for Free School Meals and also for pupils with Additional Learning Needs.

When planning and reflecting on the lessons, due consideration was therefore given to the similarities and differences not only in terms of the two school contexts but also with regards to the different academic years of the two groups of pupils, being Year 4 and Year 6 respectively.

Literature Review

Research by the Education Endowment Foundation (2018) maintains that the impact of collaborative approaches on learning is consistently positive. However, the research also highlights the importance of ensuring that that it is delivered effectively. Baines *et. al* (2015) state that in order to implement this strategy successfully, it is imperative that teachers prepare and arrange their classrooms to maximise the potential for group work. It is also important that the lessons and group work activities themselves are carefully planned in order to ensure that the pupils are challenged and the group

interactions are of a high level. Providing such supportive structures to pupils in a collaborative learning environment can be achieved to a certain extent through assigning roles within group work (Washington University in St Louis, 2016).

Stewart (2014) further maintain that when setting up collaborative learning activities, teachers need to use their professional judgement in deciding whether to assign specific roles to the pupils or to give the pupils the responsibility to decide and choose the roles themselves. However, Stewart emphasises that when pupils decide the roles for themselves, this could potentially lead to pupils playing safe and not choosing roles which may be outside their comfort zone. In order to resolve this issue, teachers could choose to rotate the roles and so ensure that all pupils experience a variety of roles within the group. Stewart also highlight the importance of pupils understanding their specific role within the group and suggest the use of role cards to assist pupils in comprehending what their specific role entails. In our research lesson study, role cards were used in the first lesson with the Year 4 pupils (Appendix 2).

Baines *et. al* (2015) furthermore maintain that teachers also need to consider the size and arrangement of the groups and how they are positioned within the classroom setting, as well as the need to prepare pupils for group work through a 'relational approach', where children develop their group working skills and feel comfortable participating, questioning, discussing problems and taking responsibility for their own learning. This is further substantiated by other research results including the Social Pedagogic Research into Grouping (SPRinG) (2007) study, which found that there was a large gap between realising the potential of group work and the limited use of group work in schools. The study further highlighted that both pupils and teachers have apprehensions around group work and that the groups are formed in classrooms often without due consideration of their purpose.

In terms of how this view relates to our research question with regards to pupils having specific group roles, it suggests that as teachers, we need to ensure that the pupils have a clear framework and structure not only of the specific task in hand but also that pupils are fully aware of what is expected of them in undertaking their specific role (Primary Professional Development Service, 2013). As such, as identified by Baines *et. al* (2015) training of staff is key, so that collaborative learning groups are not merely

directed on how to complete the task but rather, are monitored, guided, coached and scaffolded in order to use their abilities to understand and do the task. This view is reiterated by Donaldson (2015), who maintains that planning and teaching should create structured contexts for collaborative learning to take place constructively and so enable pupils to become creative, critical thinkers.

The Education Endowment Foundation (2018) further suggest that teaching approaches which promote talk and interaction between learners tend to result in the best gains and highlight the importance of encouraging pupils to talk and articulate their thinking in collaborative tasks. By allocating specific roles in the group, all pupils are given an opportunity for participation which could potentially reduce the likelihood of one individual dominating the task to the detriment of the learning of the other group members (Washington University in St Louis, 2016).

Conversely, Randall (1999) cautions against overuse of group work and suggests that the many benefits of collaborative learning sometimes blind us to its weaknesses. She maintains that by making members of the group responsible for each other's learning, this potentially could result in the stronger students teaching the weaker students and so doing most of the work or taking over their role in the group. Nevertheless, Donaldson (2015) maintains that pupils need to actively collaborate with their peers with the result that they become active participants in the learning process with a greater understanding of how to learn and how to establish the best environments for their own learning. Donaldson’s view is reiterated by Hattie (2009), who argues that collaborative learning methods are much more valuable than individualistic methods in terms of pupil performance and progression. Hattie maintains that effective collaboration recognises the merit of all pupils in the group, and so each child is allowed to work to their strengths and, when needed, gain support from their group peers. This can be viewed in terms of having specific roles within a group where pupils build on their strengths through carrying out roles they are most suited to and by gaining support from peers when performing a role where they feel less confident.

The body of research outlined above provides meaningful support to our research question and presents a valuable framework in terms of establishing the potential

impact on pupils' engagement and participation where specific roles within a collaborative learning group are assigned.

Lesson Study

The methodology used in order to carry out our research project is Lesson Study research which is a form of action research. The method originates in Japan, where it was practised as far back as the 1870s (Dudley, 2014). It has since become more widely used in the West and was introduced to the United Kingdom by Peter Dudley in 2001.

Lesson Study research methodology is a professional learning process which focuses on pupils' learning and the progress that they make through their teacher's development of particular pedagogic practises which aim to improve a specific area of teaching and learning identified within their school (Department for Children, School and Families, 2008; Dudley, 2014).

As such, Lesson Study is a model which encourages collaboration between teachers where a small group of teachers (usually two or three) work together to develop practices in the classroom which focus on the learning and needs of their pupils and at the same time attempting to solve a teaching problem which is affecting the progress of pupils. Teachers then disseminate the practical knowledge gained from carrying out the research to others (Department for Children, School and Families, 2008). Furthermore, Robinson *et. al* (2009) maintain that participation in collaborative studies to improve teaching and learning has the greatest impact in improving educational outcomes for pupils.

The Lesson Study cycle is illustrated below.

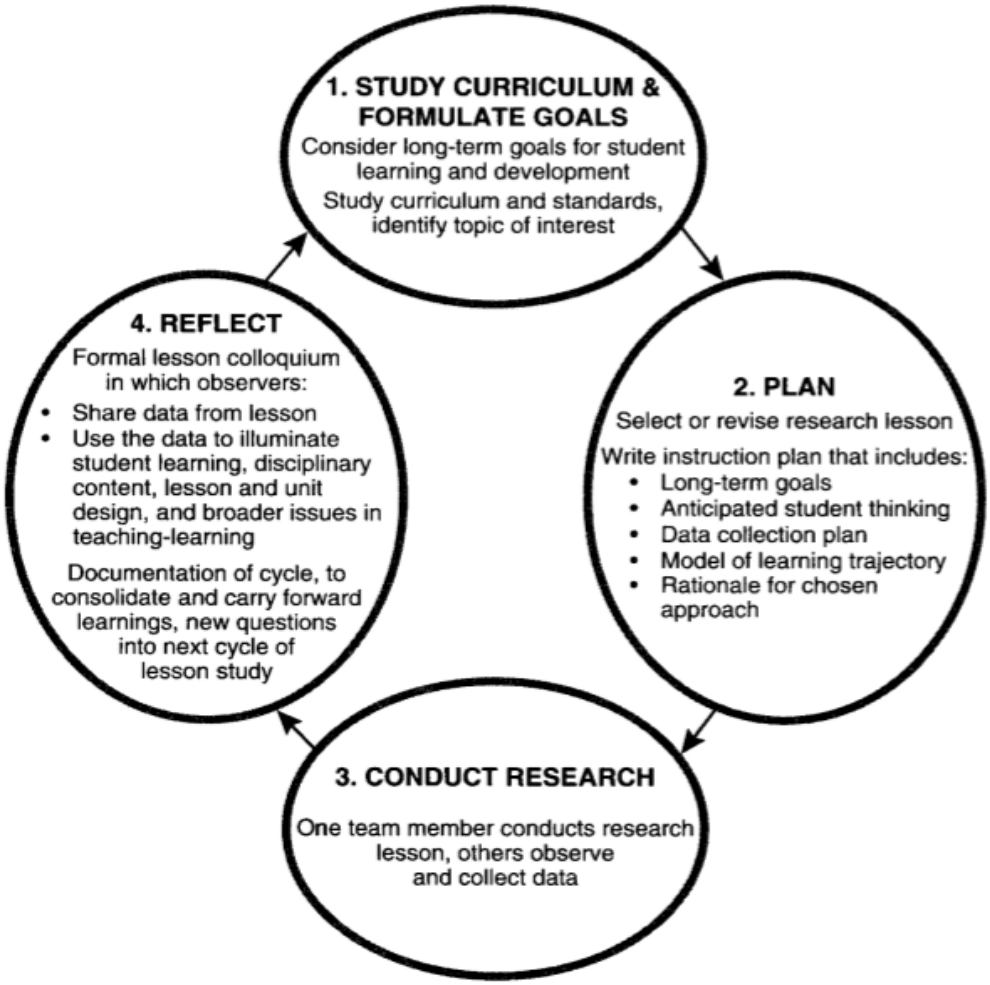

Figure 1. Lesson Study Cycle (Lewis et. al, 2006)

The topic of interest chosen for this particular research focusses on ascertaining whether having specific roles in collaborative learning groups potentially improves pupil engagement and participation. Following the Lesson Study cycle, the next step in the research process was to plan the research lesson and review the methods of collecting the required data. A collaborative learning lesson was planned that was suitable and appropriate for both year groups, being years 4 and 6 respectively, whilst also enabling satisfactory data collection in order to address the research question (Appendix 3).

The observation was a semi-structured observation where the data was captured using an adaptation of Dudley's research lesson study observation schedule and

Laevers' (1994) Leuven Scale of Involvement. During the lessons, the teaching partner was a participant observer with the non-teaching partner being a non-participant observer. The non-participant observer captured the data on the observation schedule which was completed by means of rating on a scale using the adapted Leuven Scale with additional observational field notes where it was deemed necessary to add further information.

Parental consent was obtained prior to the start of the lesson in the form of a letter sent home to parents and pupil assent to the observation was obtained at the start of the lesson in the form of a signed agreement. Both documents were retained by the respective schools in line with data protection regulations (Data Protection Act,1998). A total of eight pupils in both lessons were observed.

The data collected was qualitative in nature. Blandford, A. (2013) refers to semi-structured qualitative research as that which does not have a hypothesis but rather has a question or research problem. She continues to state that the outcomes of the research could possibly be different to what the researcher anticipates and depends to some extent on the individual personalities of the participants, in this case being the observed pupils. This can therefore have a significant influence on the overall findings of the research study. At the start of the research study, it was anticipated that the observations would demonstrate that levels of pupil engagement and participation would increase in collaborative learning groups where the pupils had specific group roles.

By using a rating scale for the lesson observations, the advantages, as outlined by Michigan State University (unknown date), were that it was a fairly simple and convenient method of recording the observation and was not particularly time consuming. It was also relatively easy to score for research purposes and the degrees of the observed engagement and participation could be noted as opposed to just observing whether or not there was any indication of pupil engagement and participation. However, Michigan State University also highlighted certain disadvantages with this method of observation. The adapted Leuven rating scale only examined specific behaviours and so during our observations, there was the possibility of overlooking other equally important behaviours in terms of the pupils' participation

and engagement. The allocation of ratings is subjective in nature and whilst all effort was made to ensure impartiality, there was still the potential for unintended bias by the observer. This method of data capture does not record as much information as other methods in terms of the context of pupils' behaviour. To mitigate this to some extent, a general comments section was included on the observation schedule making it possible when observing to provide additional detail and information.

Following the lesson observation, a semi-structured interview with three focus pupils was carried out. Again, parental consent was obtained prior to the start of the lesson by letter and pupil assent was obtained at the start of the interviews in the form of a signed agreement. Retention of these documents were as previously noted. The focus group pupils were asked prepared questions in order to provide additional insight into the levels of participation and engagement the pupils experienced during the lesson. Such semi-structured interviews are a common research interview technique where the interviewer is able to explore key themes but with some flexibility around the order of questioning.

The focus group consisted of mixed attainment children selected at random from the class and the pupils observed during the lesson. The pupils selected were an appropriate representation of the demographics of the whole class. The data collected from the focus group interview was qualitative in nature as it reflected the experiences, attitudes, reactions and feelings of the pupils. Gibbs, A (1997) maintains that focus group research provides such data in a manner that would not be feasible using other research techniques. Gibbs further highlights the advantages of using focus group interviews in that relatively large quantities of data can be generated in a short space of time and pupils in the group could potentially query and discuss their responses with each other. However, she also recognises the need to be mindful of the fact that this does depend to some extent on the group dynamics, which need to be carefully managed by the interviewer in order to avoid dominant personalities taking over the conversation.

It was anticipated that the data from the focus group interviews would provide additional insight into the levels of engagement and participation of the pupils and also assist with the post lesson reflections and future planning.

Following the focus group interviews, the lessons were reflected upon in order to make improvements to the lesson with the focus being the pupils' learning outcomes. The Welsh Government (2015) maintains that reflective practitioners aim to learn from their experiences by regularly questioning not only what they do but also why they do it. WG continue to state that effective practitioners, through evaluation of their practice are able to ascertain their strengths and areas for development.

Initial reflections following the lessons were captured using the Assisted Reflective Conclusions (ARC) model where, through contextualising the initial feelings and experiences of the lesson, it was then possible to analyse and evaluate any specific causes for concern. As such, solutions and actions were able to be put in place in order to improve and transform the teaching and learning experience in the following lesson. A similar reflection approach was also used, being Kolb's Experiential Learning Cycle (1984). Kolb emphasised that reflective observation was a means of analysing and drawing conclusions from an experience with the aim being to take this learning into new experiences and so completing the cycle. His learning cycle is illustrated below.

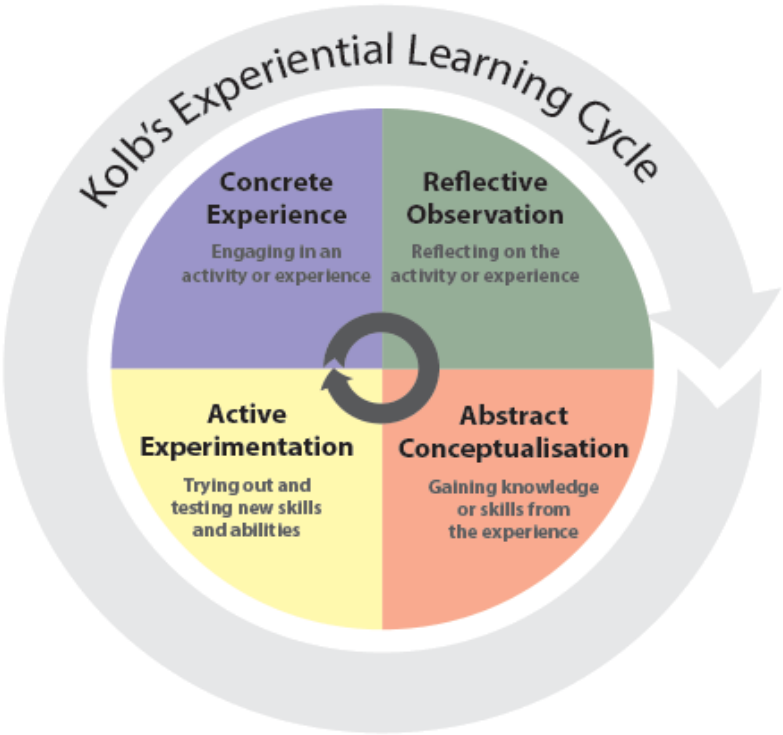

Figure 2. Experiential Learning Cycle (Kolb, 1984)

Ethical Considerations

The research was carried out with due consideration of the University guidelines on ethical research, University of Wales Trinity Saint David Research, Ethics and integrity Code of Professional Conduct and Practice (2017) and British Educational Research Association Ethical Guidelines for Educational Research (2011) with regards to pupil anonymity and confidentiality. The ethical requirements embodied within the Education Workforce Council Code of Professional Conduct and Practice (2017) were also adhered to throughout the process. For the purposes of this research project, no photographs or filming of pupils was necessary.

Assent was obtained from the pupils involved as well as adult consent from their parents or legal guardians. Legal requirements with regards to working with children were complied with, including adhering to the guidelines set out in the safeguarding policies of the respective participating schools.

At the beginning of the observation lessons, all pupils were informed that they could withdraw from being observed or from participating in the research study at any point. There were no pupils who indicated that they did not wish to participate. However, should any child have expressed a preference not to have participated, they would not have been treated any differently to the other pupils in the class.

Prior to the focus group interviews, the same process was followed. Pupils were also asked if their responses from the interviews could be used for research purposes. The pupils' wellbeing was monitored throughout the process and they were aware that they could withdraw from the activity at any point. Furthermore, the questions asked in the focus group interviews were not leading in nature and were not worded in any way so as to risk the pupils' changing their viewpoints or showing potential bias towards a particular answer.

The research methods chosen were well established and fit for purpose. No incentives were offered to the pupils in order to reduce any potential impact of bias on the data and to ensure that the pupils did not feel pressured into taking part.

In line with data protection regulations contained in the Data Protection Act 1998, relevant data stored electronically was password protected and all pupils' anonymity was maintained throughout the research process.

To mitigate any potential risk to the University of adverse publicity or data protection breaches, the research has been conducted and the results have been represented honestly and in a professional, ethical and appropriate manner.

Analysis of Lesson Study 1

The first lesson was delivered to a Year 4 class of 30 pupils in a large Junior School. The full lesson plan is at Appendix 3. The learning objective was to cooperate within a group to design and build a structure for an 'egg drop challenge'. The success criteria included being able to listen, respond and share ideas with the other members of the group and for the pupils to be able to engage with and carry out their assigned role. At the start of the lesson pupils were placed into groups and assigned their specific roles. Role cards with were given to the pupils in order to prompt them with regards to the duties involved in carrying out their specific role.

As the teacher of this lesson and thus the participant observer, my initial reflection as highlighted in the ARC (Appendix 4) was that the majority of pupils were on task and participated well in their groups. Engagement was perceived to be relatively good overall and most pupils were engaged with the responsibility of their roles. However, a minority of pupils did not work particularly well in their groups and some pupils did not engage with the specific role they were given. In some instances, stronger members of the group dominated the activity resulting in quieter members not being given enough scope to put forward their ideas, a concern of collaborative learning also identified by Gibbs (1997).

This is further evidenced from the data collected in the observation schedule by the non-participant observer (Appendix 5). The levels of engagement and participation of five of the eight pupils observed were scaled at level 4 or higher, suggesting that the class were mostly engaged and participated well in their groups and with their roles.

Where the levels of participation and engagement were scaled at level 3 or less, the additional narrative information suggested that the particular pupils were not overly confident in putting their ideas forward (pupils D and E) or, as in the case of pupil A, that more dominant members of the group took over pupil A's role at certain stages of the lesson with the result, in this instance, that pupil A's level of participation and engagement reduced. However, it is worth noting here the responses of pupil D in the focus group interview (Appendix 6) which suggest that pupil D's level of engagement was potentially higher than perceived and recorded on the observation schedule and that pupil D was content and engaged with their assigned role.

The data results of all eight pupils observed showed that their engagement and participation was either as originally predicted or at slightly lower levels than predicted. In the instances where the level of participation and engagement was lower than predicted, the narrative information relating to the specific pupils suggested that the pupils were either quiet members of the group (pupils D and E) and so were not perceived to engage or participate fully with their role, or that there were issues relating to the role they were assigned (pupils G and H). Indeed, Pupil G when interviewed as part of the focus group interview, stated that whilst not initially keen on having the role of timekeeper at the start of the lesson by the end of the lesson, they were quite happy with that particular role.

Further analysis can be obtained from the results of the focus group interview responses. All three pupils interviewed agreed that having a role made the lesson more interesting and all three enjoyed the lesson overall with the building and testing stages being the most enjoyable parts of the lesson. Two of the three focus pupils would change their role should the lesson be repeated. When asked how the lesson could be improved, two of the three pupils suggested having different or a greater variety of materials available for the groups to use in the design and build stage.

At the centre of this research's reflection process is the consideration of pupil engagement and participation where specific roles are assigned in collaborative learning groups. Using Kolb's experiential learning cycle, the first stage of the cycle was the concrete experience of delivering the lesson, observing the pupils and carrying out the focus group interviews. Following this, reflective observation took

place capturing the lesson reflections in the ARC and analysing the data from the observations and focus group interviews. Connections were made between the data and the research question as outlined in the preceding paragraphs.

In the third stage of the learning cycle, abstract conceptualism, the knowledge of the experience gained was used to develop changes to the original lesson with a view to improving the pupils' learning outcomes and experiences, also noted in the ARC reflection. It was agreed that in the second lesson the groups should be smaller in size, reducing to four pupils instead of five as was the case in this lesson. Whilst more interactions are possible in larger groups and so could result in a greater depth of contributions, more support is required however in order to support the pupils in their learning. The pupils also need to be more skillful in terms of turn taking etc. (Primary Professional Development Services, 2013). In smaller groups, there could be potentially more opportunity for all pupils to be fully engaged and be given the chance to participate and so become more engaged with their specific role. As such, the role of rule and volume checker was removed, and the timekeeper role was changed slightly to include a photographer role.

It was also agreed that in the following lesson with the year 6 pupils, the group roles would not be assigned to them at the start of the lesson but rather, they would be given the opportunity to discuss the roles in their groups and allocate them based on the strengths of the pupils within the cooperative learning group which is also identified as good practice by Stewart (2014). Additional resources and materials, following the specific feedback from the pupils in the focus group were also supplied.

This then leads on to the final stage in Kolb's experiential learning cycle. Active experimentation is the stage where the knowledge acquired, and the changes made to the lesson, are applied to the new situation and experience, in this instance being the next lesson delivered to the pupils in year 6. The cycle then starts again (Bassot, 2016).

Analysis of Lesson Study 2

The second lesson, with the amendments as discussed above was delivered to a year 6 class of 30 pupils in a medium sized primary school. The learning objective and success criteria were the same as lesson 1. At the start of the lesson, pupils were placed into collaborative learning groups of four pupils but instead of the roles being assigned to them the groups were informed what the specific roles were and were then given the task of discussing the roles and allocating them based on the strengths of the pupils within their cooperative learning group.

In this lesson I was the non-participant observer and my partner taught the lesson, following which an ARC reflection was written. This identified, as in Lesson 1, that whilst the majority of the groups collaborated effectively, and the pupils were engaged with their specific roles, there were instances where engagement and participation were not perceived as being so high. In the main this was due to a clash of personalities within the specific groups identified. With regard to the pupils deciding their roles, it was noted that some groups were more democratic in the choosing and allocating process than others.

This is further evidenced from the observations and the data recorded in the observation schedule (Appendix 7). As in Lesson 1, the levels of engagement and participation of five of the eight pupils observed were scaled at level 4 or higher, suggesting that the class were mostly engaged and participated well in their groups and with their roles. The remaining three pupils were scaled at level 3-4, with the additional narrative suggesting that this was due in part, in the case of pupil C, to their seating position within the group or, in the case of pupils A and E, that there were specific sections of the lesson where there were dips in their engagement and participation. Interestingly, in the case of pupil E, the dis-engagement with the ideas and design stage of the lesson were observed to be due in part to the pupil focussing solely on their role within the group of timekeeper / photographer.

Further analysis can be obtained from the additional narrative on the observation schedule with regards to the groups choosing and allocating specific roles. It was observed that pupils F-I opted not to choose roles but rather to share the roles so no

one pupil had a specific role. However, the pupils did need to be reminded that one of the group would have to be responsible for the timekeeping role.

In addition to the observation data, the results of the focus group interviews suggest that all three pupils interviewed agreed that having a role made the lesson more interesting (Appendix 8). However, it is worth noting here that two of the three focus pupils would have preferred to have the role assigned to them by the teacher as opposed to allocating the roles themselves in their groups. The main reason for this seems to be due to dominant personalities within the groups deciding the roles for the whole group. The interview responses of these two pupils suggest that they would have preferred a different role to the one they were allocated. When asked how the lesson could be improved, one of the three pupils suggested being able to have a say in choosing the members of the group, implying that this would have resulted in a more effective collaborative learning experience.

Using Kolb's learning cycle, the delivery of this second Lesson, being the active experimentation stage, was where the changes made to lesson 1 were introduced and applied. Following this lesson, the cycle then started again resulting in greater knowledge and experiences gained, which encouraged discussion on further improvements that could potentially be made in order to ensure greater learning outcomes for the pupils. From the evidence suggested by the focus pupil responses, in future lessons where groups are tasked with allocating their own roles, it may be prudent to allocate one pupil in the group the role of 'organiser', giving them the responsibility of managing a fair and democratic discussion where all members of the group are given the opportunity to put forward their role preference. The organiser could then facilitate a group vote if required to ensure the fairest allocation of the group roles. Role rotation could also be considered as a means of ensuring that the work load is distributed fairly amongst all members of the group and that the pupils are aware that they will be allocated each of the roles at some point over a period of collaborative learning sessions. This has also been highlighted as good practice by Brame and Biel (2015).

Research Findings in relation to relevant literature

The main finding of this research suggests that whilst having specific roles in collaborative learning groups potentially increases the level of pupil engagement and participation, as highlighted by the data collected in the observation schedule and the pupils' responses to the focus group interviews, this is just one of many factors for consideration.

It was anticipated that by allocating specific roles in the groups, pupils would be given more of an opportunity for participation and therefore stronger members of the group would be less likely to dominate the task, a view shared by Washington University in St Louis (2016). Hattie (2009) also suggests that pupils could build on their strengths in group work and can gain support from peers with all members of the group with the merits of all pupils in the group being recognised. Whilst it was observed that this occurred in the majority of groups in this research study, there were instances in both lessons, where engagement and participation was reduced as dominant members took over the role of others in the group. This links with Randall's (1999) view that stronger students could potentially end up teaching the weaker students and so doing most of the work or taking over their role in the group.

From the observations and pupil interviews after research Lesson 2 where pupils were given the responsibility to choose their roles, this did not necessarily increase the levels of participation and engagement as anticipated but rather was a cause for concern for some pupils who felt that they had been assigned a role without having a voice in the decision. As discussed in the literature review above, Stewart (2014) highlights that teachers need to use their professional judgement in such instances and ensure that pupils have a clear framework and structure of what is expected of them in undertaking their specific role.

Baines *et. al* (2015) maintain that the preparation of the classroom is key, including the size and arrangement of the collaborative learning groups. With regards to the research lessons delivered, these views suggest that there could have been greater consideration given to the personalities of the pupils before placing them in their groups and in some instances the seating position of the pupils.

In terms of what these findings mean not only for the pupils of both research classes but also for my future teaching approaches going forwards, it implies that whilst the allocation of specific roles within collaborative learning groups has the potential to increase pupil engagement and participation, it can be argued however, that more practise and exposure to collaborative learning in groups is required in order to develop both teacher and pupils' skills as necessary. This concurs with Donaldson's (2015) view that pupils need to be able to actively collaborate with their peers in order to become active participants in the learning process and so gain a greater understanding of how to learn and that teachers need to create structured contexts for collaborative learning to take place productively.

Conclusion and Recommendations

Leung (2015) argues that the nature of qualitative research is to understand and interpret the many facets and richness of dialogue in order to provide supporting evidence for specific theories. As such, when reviewing research data based on qualitative research it is necessary to consider the reliability, validity and generalisation of such data.

In terms of the data collected and reported in both the observation schedule and the focus group interviews, it could be argued that there were some concerns with regards to the reliability of the data in this research study. Grossoehme (2014) maintains that in order for qualitative research to be considered reliable, there has to be consistency in the data collected and the ability for the collection methods to be repeated exactly.

With regards to the data recorded in the observation schedules where the pupils were rated using the adapted Leuven scale it could be considered that there was some degree of consistency and repeatability here as the scale provided a clear framework for observation. This would suggest that there was a reasonable assumption of reliability with this data collection method and indeed with the actual data collected in both research lessons. However, it is necessary to be mindful of potential errors in the measurement of the responses by the observer and also the characteristics of the pupils which could possibly create a bias as to how the observer perceives that

particular pupil to respond (Crocker and Algina, 1986). An example of this is discussed earlier with regards to pupil D in the analysis of Lesson Study 1.

In terms of the data collected during the focus group interviews it could be argued that less reliability could be placed on this data. This is due to the nature of conversation generally, as such dialogues are not easily repeatable. In the focus group interviews the pupils were asked open ended questions and so were able to talk freely, giving their own opinions and views which would not necessarily be the same as any other pupil. This was mitigated to some extent by having predetermined questions which were asked to all the pupils in the focus group interviews. However, it should be noted that the same pupil could potentially answer the same questions with different responses on separate occasions depending on factors such as mood or relationship to interviewer. During the focus group interviews it was not possible for the interviewer to control such factors which further implies that there were issues around the reliability of this data collected.

Carey (2012) suggests that what qualitative research loses in reliability it tends to gain in validity. He further implies that validity is concerned with the strength of the research findings to the extent that they are sound and true. In this research study, it could be argued that the validity of the data collected during the focus group interviews was relatively high as through the use of open ended questions a greater depth of information could be provided by the pupils as highlighted in the preceding paragraph. Conversely, whilst the data collected in the observation schedules had greater reliability, it was to some extent less valid due to the closed nature of the observations by rating against a pre-determined scale although the use of the additional narrative in the observations lessened the impact of this.

One key aspect concerning the methods of data collecting for the purposes of this research lies in the ability, or lack of, to generalise the findings. Ritchie and Lewis (2003) highlight the importance of generalisation where it can be concluded that the findings of the research are of relevance beyond both the sample and the context of the research itself. In terms of the class observations where there was a specific framework, this suggests that the findings of this data could be viewed as representative of pupils within a key stage 2 setting generally. However, there are

limitations with this generalisation in that the observed pupils were only from years 4 and 6 and so there is no data from other year groups that can be compared. Also, only two classes and so only two groups of pupils were actually observed and thus there was only a small sample to generalise from.

With regards to the responses from the focus pupils, it would be more difficult to generalise the findings of this data due to the nature of the data being both personal and varied. However, in terms of the research question, the responses from all pupils in the focus group interviews was that having a specific role made the lesson more interesting for them. In this regard, it could be argued that these responses could be generalised in the context of the research itself.

Other considerations to note were that there was no baseline data for this specific lesson plan to compare against as the lesson had not been previously delivered to pupils without the use of specific group roles and it would seem reasonable therefore to recommend the delivery of such a lesson beforehand in future similar research studies. However, some comparisons can be drawn from the ARC reflection at Appendix 4 which suggests that the learning outcomes of the pupils in the research lesson were improved due to, amongst other factors, the inclusion of specific roles in their collaborative learning groups.

It could therefore be suggested from this research study that there is a potential link between increased pupil engagement and participation where pupils are assigned a specific role in collaborative learning groups. However, the research itself is not without its limitations as outlined throughout the assignment. In terms of what this means for future teaching practices, it would be prudent to suggest that in order to realise the many benefits of collaborative learning, one facet of which is the assignment of specific roles, properly structured lessons should be delivered within a framework where both the pupil and the teacher are clear in their understanding of what is required of them to achieve the teaching and learning goals

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Appendix 1

Assisted Reflective Conclusions (ARC) Model **Date:** 8th February 2018

Critical incident (focus): Science lesson – planning investigation & experiment.

Experience	
Feelings *"What are your feelings regarding the experience?"*	The session did not flow as intended. Engagement was an issue and several pupils did not achieve the learning objective.
Remember and Understand *"Can you list the aspects of the learning experience that went well?"* *"What were the elements of the learning experience that were disappointing?"*	Good hook and link to prior learning. Lesson well resourced and planned. Children were occasionally off task and there was possibly not enough learning taking place.
Evaluate and analyse *"What will you keep the same to ensure effective teaching and learning in the future?"* *"What was the cause of the most important disappointing element?"*	Planning and resourcing is of a good standard & I understand the need for effective hooks. Chunking the task works too. The collaborative groups did not work well together. The children were off task a lot of the time. This was potentially due to two main reasons. 1) I did not give them enough ownership of the task and so they were in part being spoon fed what to do. 2) the pupils were not given specific roles within their group which would have ensured greater collaboration and less fussing.
Conclusions and actions *"What are your possible solutions to the disappointing issues identified?"* *"What will you do next?"*	After discussion with the class teacher at the end of the lesson, it was clear that the lesson lacked momentum and dragged in areas where a quicker flow would have been more beneficial. The groups did not work well together. This could have been avoided by giving the pupils individual roles such as organiser (making sure that each pupil contributes and idea for discussion / to write down); scribe; timekeeper; measurement reader etc depending on the specific task. The other element that did not work well in the lesson was the fact that the children did not really own the task as I kept too much control of it. I would in future keep the discussion element of the lesson with verbal feedback from the groups as to the elements required for the investigation. Then I would ask the groups to write down what the specific elements of the investigation are without modelling it on the board for them to reduce the amount of copying. Time limits for sessions should have been introduced to help with the flow of the lesson.
Transformed experience	

Appendix 2

Role Cards

ORGANISER

- Keep the group on task.
- Make sure that everyone has a chance to give their ideas.
- Encourage everyone to listen to each other.

TIME KEEPER

- Give regular time checks.
- Encourage the group to keep to time.
- Let the group know when a task is about to end.

RULE & VOLUME CHECKER

- Make sure that you check the rules at every stage.
- Let the group know if something is against the rules.
- Make sure everyone uses their 'classroom voices' when working

ARTIST

- Make sure you have pencils, rubber, sharpener etc.
- Listen to everyone's ideas before drawing.
- Draw the **group's** design and write the instructions.

BUILDER

- Listen to everyone's ideas before building.
- Use the group's design and instructions.
- Build the 'creation' ready for testing.

Appendix 3	Canolfan Addysg Athrawon De-Orllewin Cymru — The South West Wales Centre of Teacher Education	1B

Session Plan – Key Stage 2

Name of trainee: 1700217		Session ref: 3 27/03/18 1:00pm – 2:00pm	
Personal target(s) in relation to QTS:	S3.3.3 Teach clearly structured lessons where the LO is clear; collaborative group work; independent learning.		
Year group: 4	No. of learners: 30	*ALN:* Collaborative learning groups – mixed attainment pupils.	
Learning objective(s): To cooperate within a group to design and build a structure for the egg drop challenge.		Success criteria: • Can I listen and respond to others' ideas? • Can I share my own ideas within the group? • Can I carry out my own role within the group? • Can we complete the task within the timeframe?	
Links to previous learning: Problem based learning activities; working in collaborative groups.			
Curriculum coverage (range, skills): **Design Technology (Skills):** Develop a simple specification for their products indicating their intentions and approach. Demonstrate their creative thinking when considering and recording solutions to problems that arise during their designing and making, Work to their specification to make products. Choose appropriate materials, ingredients, equipment, tools/utensils and techniques, from a range made available to them. (**Range)** Tasks in which they design and make products, focusing on different contexts and materials. They should be given opportunities to be creative; innovative; work in groups.			
Literacy(LNF): Listen carefully to presentations and show understanding of main points; Contribute to group discussion and help everyone take part; Help group to reach agreement keeping focus on the topic.		*Numeracy (LNF):* Identify the appropriate steps and information needed to complete the task or reach a solution. Select appropriate mathematics and techniques to use. Select and use suitable instruments and units of measurement.	
DCF *Using ipad effectively to record and monitor time intervals.*	*Thinking* *Build upon existing skills, knowledge and understanding. Pupils plan the process and method to be used.*	*ESDGC* *Understanding products and services we use – recycling of plastics used afterwards.*	*YCC*
Key vocabulary(English/Welsh): Team work, structure, collaboration, cooperation, specific roles, protection, volume Grandewch, diolch, bendigedig, da iawn, barod.			

Time	Session activities, organisation and management	Key questions & AfL opportunities
10-15 mins	**Introduction** • Introduce colleague. Read through assent doc. Gain assent from pupils by asking them to write their names on a piece of paper on their desk. • Juggle eggs – link to Easter – drop eggs on floor. Why have they broken? What could we do to stop them breaking? • Explain that the class are going to be working in collaborative learning groups today. • Go through ppnt – what are the roles- what do they involve? Have the stages in the ppnt. Explain strict time limits for the task. • Explain what the lesson involves and share the LO and SC of the lesson (SC will relate to collaborative learning such as, 'Can I listen to others' ideas and share my own with the group.'	Assessment for learning: Collaborative groups
30 mins	**Main activities** 15 mins – ideas and design stage. Groups to share ideas and start to design a structure to stop the egg from cracking or breaking when dropped from approximately 3m. 15 mins – building stage. Groups start to build their designs using the materials provided.	
10-15 mins	**Plenary** Link back to SC & WWW / EBD. Testing the designs by dropping the structures and eggs to see if the designs are successful in stopping the egg from cracking.	

Appendix 4

Assisted Reflective Conclusions (ARC) Model.

Date: 27th March 2018

Critical incident (focus): Design and technology collaborative learning lesson with allocation of group roles.

Experience	
Feelings *"What are your feelings regarding the experience?"*	Overall positive. Most pupils engaged and participated well in their groups. A minority of pupils not engaged at all times with some low-level fussing.
Remember and Understand *"Can you list the aspects of the learning experience that went well?"* *"What were the elements of the learning experience that were disappointing?"*	Majority of pupils were on task and participated well in groups. Engagement was relatively good overall. Good hook to get the children's attention at the start of the lesson. Lesson timings were planned well and all groups completed the task within the timeframes. Most pupils engaged with the responsibility of their roles. Minority of pupils did not work well in their groups and some pupils did not engage with the specific role they were given. In some instances, stronger members of the group dominated the activity resulting in quieter members not being given enough scope to put forward their ideas.
Evaluate and analyse *"What will you keep the same to ensure effective teaching and learning in the future?"* *"What was the cause of the most important disappointing element?"*	Use of effective hook to engage children at the start of the lesson. Use of specific time limits for tasks in order to keep the lesson on track and moving at a defined pace. Having specific roles within the collaborative learning groups works well albeit see below for further reflection with regards to this point. Not all pupils participated fully. This could have been caused by the size of the group being too large. Some pupils were not engaged fully with their specific role and would have preferred another role instead.
Conclusions and actions *"What are your possible solutions to the disappointing issues identified?"* *"What will you do next?"*	On reflection, I would consider having smaller groups. In this lesson there were groups of 5 and one group of 6. Whilst more interactions are possible in larger groups and so a greater depth of contributions, more support is required in order to support the pupils in their learning and the more skillful the pupils must be in terms of turn taking etc. (Primary Professional Development Services, 2013). Also, not all pupils were given the chance to participate as fully as intended. In smaller groups, there could be potentially more opportunity for all pupils to be fully engaged. I would consider role rotation and also letting the pupils choose their own roles or having a discussion within the group as to how to allocate specific roles based on the strengths of the pupils within the collaborative learning group. This could be an additional task. It may be that the 'organiser' is pre-chosen and they have to facilitate the discussions within the group but this is definitely an option that I would consider introducing in a future similar lesson. This is discussed in further detail in http://www.belb.org.uk. For next lesson (lesson 2) in Year 6 class allow the groups to choose roles and try smaller groups of 4 instead of 5.
Transformed experience	

Appendix 5

Research Lesson Study Observation Schedule Lesson 1

How can having specific roles in collaborative learning groups improve pupil engagement and participation?

Focus Pupil B – role: Builder Level of Engagement / Participation in lesson (see guide below)	**Focus Pupil A – role: Builder** Level of Engagement / Participation in lesson (see guide below)		**Focus Pupil B – role: Organiser** Level of Engagement / Participation in lesson (see guide below)		**Focus Pupil C – role: Timekeeper** Level of Engagement / Participation in lesson (see guide below)	
Stage of lesson sequence	How you predict focus pupil A will respond	*How they are observed to respond*	How you predict focus pupil B will respond	*How they are observed to respond*	How you predict focus pupil C will respond	*How they are observed to respond*
Lesson introduction/ allocation of roles (10 mins)	2	3	3	4	4	3
Ideas & Design stage (15 mins)	2	3	4	5	4	4
Build Stage (15-20 mins)	4	3	4	5	4	5
Testing & Plenary stage (15 mins)	3	3	4	4	5	4
Overall level of Engagement / Participation	2/3	3	4	4/5	4	4
General Observations Whole group (both groups)	All pupils fully engaged and focussed during egg juggling 'hook'. Group needed some prompting to stay in roles at times but generally worked very well together and were mainly on task and focussed as a group.					
General Observations	Although allocated role of builder, stronger members of the group took over at build stage resulting in level of participation going down.		Very focussed through each stage and fully in role of organiser. Tendency to dominate over other quieter members of the group.		Involved and engaged during each stage but particularly during the build stage.	

Research Lesson Study Observation Schedule **Lesson 1**

How can having specific roles in collaborative learning groups improve pupil engagement and participation?

	Focus Pupil D – role: Artist Level of Engagement / Participation in lesson (see guide below)		**Focus Pupil E – role: Rules / Volume** Level of Engagement / Participation in lesson (see guide below)		**Group 2 Focus Pupil F – role: Organiser** Level of Engagement / Participation in lesson (see guide below)	
Stage of lesson sequence	How you predict focus pupil A will respond	*How they are observed to respond*	How you predict focus pupil B will respond	*How they are observed to respond*	How you predict focus pupil C will respond	*How they are observed to respond*
Lesson introduction/ allocation of roles (10 mins)	4	3	3	2	4	3
Ideas & Design stage (15 mins)	4	3	3	2	5	4
Build Stage (15-20 mins)	4	2	3	2	4	4
Testing & Plenary stage (15 mins)	4	3	3	3	5	5
Overall level of Engagement / Participation	4	3	3	2	4/5	4
General Observations	Quiet member of the group. Listens to others' ideas well, not overly confident in putting own ideas forward.		Quiet member of the group. Roughly the same level of engagement and participation throughout. Not overly confident in putting own ideas forward.		Fully engaged and participated well throughout. Good explanation at the end of the process the team went through.	

Research Lesson Study Observation Schedule Lesson 1

How can having specific roles in collaborative learning groups improve pupil engagement and participation?

	Group 2 Focus Pupil G – role: Timekeeper Level of Engagement / Participation in lesson (see guide below)		**Group 2 Focus Pupil H – role: Artist** Level of Engagement / Participation in lesson (see guide below)			
Stage of lesson sequence	How you predict focus pupil A will respond	*How they are observed to respond*	How you predict focus pupil B will respond	*How they are observed to respond*		
Lesson introduction/ allocation of roles (10 mins)	4	3	4	3		
Ideas & Design stage (15 mins)	5	5	4	3		
Build Stage (15-20 mins)	5	5	4	4		
Testing & Plenary stage (15 mins)	5	4	4	4		
Overall level of Engagement / Participation	5	4/5	4	3/4		
General Observations	Initially not happy with role of timekeeper but soon became fully engaged and participated well during the design and build stage.		A bit unsure with role of artist initially – group needed prompting to make sure that their ideas were conveyed clearly to the artist. Fully engaged after this especially during build stage.			

Appendix 5 cont.

Adapted Leuven Scale of pupil engagement & participation		
Level	**Engagement / Participation**	**Examples**
1	Extremely low: ***the pupil shows hardly any activity and does not participate or interact with the group even after encouragement from other group members.***	• Does not contribute any ideas to the group, even after encouragement. • Does not show any signs of engaging with responsibilities of specific role given. • No concentration: staring, daydreaming. • An absent, passive attitude. • No signs of exploration and interest. • Not taking anything in, no mental activity.
2	Low: ***the pupil shows some degree of activity and participates and interacts to some extent with the group after encouragement from other group members.***	• Contributes few ideas to the group, needs encouragement. • Shows some signs of engaging with responsibilities of specific role given. • Limited concentration: looks away during activity, fiddles, dreams. • Is easily distracted. • Few signs of exploration and interest.
3	Moderate: ***the pupil is busy the whole time, but without real concentration. The pupil generally participates and interacts with the group but still needs some encouragement from other group members.***	• Contributes ideas to the group, still needs some encouragement. • Generally shows signs of engaging with responsibilities of specific role given although is not absorbed in the role or activity. • Limited motivation, no real dedication, does not feel challenged. • Pupil does not gain deep level experience. • The activity does not address the child's imagination.
4	High: ***There are clear signs of engagement, participation and interaction with the group, but these are not always present to their full extent. The pupil will encourage others to participate at times.***	• Contributes ideas to the group and encourages others at times to contribute. • Engaged with responsibilities of specific role given and mostly there is real concentration, albeit during some brief moments the attention is more superficial. • The pupil feels challenged, there is a certain degree of motivation. • The pupil's imagination to a certain extent is addressed in the activity.
5	Extremely High: ***during the observation, the pupil is continually engaged in the activity and their specific role. They contribute and encourage others to contribute to the group. They are completely absorbed in the activity and their specific role in the group.***	• Readily contributes ideas to the group and encourages others to contribute. • Fully engaged with responsibilities of specific role given and there is real focus and concentration without interruption. • The pupil is highly motivated and feels strongly appealed by the activity and their specific role. • The pupil's imagination and mental capacity are in top gear. • Obviously enjoys being engrossed in the activity and the responsibility of their role.

Appendix 6

Focus Interview questions Pupil 1 (Pupil G)

- Were you happy with your role during the lesson?

  At the start I wasn't very happy with the role of Timekeeper but I was happy with it by the end of the lesson.

- If so, what did you enjoy / not enjoy about having that particular role?

  The role was ok.

- If not, what role would you have preferred to have?

  I would have preferred to have been the Artist as I really like drawing.

- Did having a role make the lesson more interesting for you?

  Yes, having a role was good and made the lesson more interesting.

- What did you enjoy most about the lesson?

  I enjoyed the building stage, I like building and making things.

- What would you change about the lesson if we were to do it again?

  To make the lesson better I would use different materials and use recyclable materials like packaging.

- Were there any parts of the lesson that you did not enjoy and if so why?

  No, I enjoyed the lesson.

Focus Interview questions Pupil 2 (Pupil F)

- Were you happy with your role during the lesson?

  Yes, I was happy with the role of Organiser and enjoyed it.

- If so, what did you enjoy / not enjoy about having that particular role?

  I liked the role.

- If not, what role would you have preferred to have?

  I liked being the Organiser but would like to be the Artist next time.

- Did having a role make the lesson more interesting for you?

  Yes, having a role was good and made the lesson more interesting.

- What did you enjoy most about the lesson?

  I enjoyed when we tested the structures and the eggs cracked. That was fun.

- What would you change about the lesson if we were to do it again?

  To make the lesson better I would have more materials in the bag and some different types of materials.

- Were there any parts of the lesson that you did not enjoy and if so why?

  No, I enjoyed the lesson.

Focus Interview questions Pupil 3 (Pupil D)

- Were you happy with your role during the lesson?

  Yes, I was really happy being the Artist.

- If so, what did you enjoy / not enjoy about having that particular role?

  I like drawing.

- If not, what role would you have preferred to have?

  I liked being the Artist and wouldn't want to change next time.

- Did having a role make the lesson more interesting for you?

  Yes, having a role was good and made the lesson more interesting.

- What did you enjoy most about the lesson?

  I enjoyed the whole lesson.

- What would you change about the lesson if we were to do it again?

  Not sure, I liked the lesson as it was.

- Were there any parts of the lesson that you did not enjoy and if so why?

  No, I enjoyed the lesson.

Appendix 7

Research Lesson Study Observation Schedule Lesson 2

How can having specific roles in collaborative learning groups improve pupil engagement and participation?

	Focus Pupil A – role: Designer Level of Engagement / Participation in lesson (see guide below)		**Focus Pupil B – role: Builder** Level of Engagement / Participation in lesson (see guide below)		**Focus Pupil C – role: Organiser** Level of Engagement / Participation in lesson (see guide below)		Patterns / Issues
Stage of lesson sequence	How you predict focus pupil A will respond	*How they are observed to respond*	How you predict focus pupil B will respond	*How they are observed to respond*	How you predict focus pupil C will respond	*How they are observed to respond*	
Lesson introduction/ allocation of roles (10 mins)	3	3	3	4	2	3	
Choosing Roles Ideas & Design stage (15 mins)	3 5	3 4	4 4	3 4	3 4	3 4	
Build Stage (15-20 mins)	4	4	5	4/5	4	4	
Testing & Plenary stage (15 mins)	5	5	5	5	4	5	
Overall level of Engagement / Participation	4	3/4	4	4	4	3/4	
General Observations	Contributed ideas at design stage – level of engagement went down during the build stage. Not co-operative in group at first but then became engaged again.		Engaged during the design and build stage.		Positioned on the end of the group, this potentially contributed to less involvement and engagement at times. Engaged during build stage.		

Research Lesson Study Observation Schedule Lesson 2

How can having specific roles in collaborative learning groups improve pupil engagement and participation?

	Focus Pupil D – role: Designer Level of Engagement / Participation in lesson (see guide below)		**Focus Pupil E – role: Timekeeper/photographer** Level of Engagement / Participation in lesson (see guide below)		**Focus Pupil F – role: Shared Roles** Level of Engagement / Participation in lesson (see guide below)		Patterns / Issues
Stage of lesson sequence	How you predict focus pupil A will respond	*How they are observed to respond*	How you predict focus pupil B will respond	*How they are observed to respond*	How you predict focus pupil C will respond	*How they are observed to respond*	
Lesson introduction/ allocation of roles (10 mins)	3	4	2	3	3	4	
Choosing Roles Ideas & Design stage (15 mins)	4 5	3 4	2 2	4 3	5 4	4 4	
Build Stage (15-20 mins)	4	4	2	4	4	5	
Testing & Plenary stage (15 mins)	4	5	3	5	5	5	
Overall level of Engagement / Participation	4	4	2	3/4	4/5	4	
General Observations	Asked other members of the team for their ideas at the design stage.		Didn't really contribute to the task (ideas or help build) but was really engaged and focused with specific role.				

Research Lesson Study Observation Schedule Lesson 2

How can having specific roles in collaborative learning groups improve pupil engagement and participation?

	Focus Pupil G – role: Shared Roles Level of Engagement / Participation in lesson (see guide below)		**Focus Pupil H – role: Shared Roles** Level of Engagement / Participation in lesson (see guide below)		**Focus Pupil I – role: Shared Roles** Level of Engagement / Participation in lesson (see guide below)		Patterns / Issues
Stage of lesson sequence	How you predict focus pupil A will respond	*How they are observed to respond*	How you predict focus pupil B will respond	*How they are observed to respond*	How you predict focus pupil B will respond	*How they are observed to respond*	
Lesson introduction/ allocation of roles (10 mins)	2	3	3	4	3	3	
Choosing Roles Ideas & Design stage (15 mins)	2 3	4 4	3 4	4 4	3 4	4 4	
Build Stage (15-20 mins)	4	3	4	5	4	5	
Testing & Plenary stage (15 mins)	4	5	5	5	4	5	
Overall level of Engagement / Participation	3	4	3/4	4/5	4	5	
General Observations	Became distracted at times during the build stage. Not as engaged as other members of the team but still participated well.		Engaged, good discussion with the team.		Engaged with the task, lots of positive ideas and discussion during the design stage.		

Appendix 7 cont.

Additional Notes

Group 1 (Pupils A-E): The group did not work as well together as group 2, it could be the positioning on the table of the group. There seemed to be two pairs working really well together and the time keeper/photographer focusing on ipad. The pairs were both working on the different parts of the same design. All were engaged once they got in to the building stage.

Group 2 (Pupils F-I): The group worked really well together as a team. They did rock, paper, scissors to initially to decide on the roles, however, the group decided to share the roles so no one had a specific role and this worked well for this group. There weren't any personalities dominating this team unlike group 1.

Appendix 7 cont.

Adapted Leuven Scale of pupil engagement & participation		
Level	**Engagement / Participation**	**Examples**
1	Extremely low: ***the pupil shows hardly any activity and does not participate or interact with the group even after encouragement from other group members.***	• Does not contribute any ideas to the group, even after encouragement. • Does not show any signs of engaging with responsibilities of specific role given. • No concentration: staring, daydreaming. • An absent, passive attitude. • No signs of exploration and interest. • Not taking anything in, no mental activity.
2	Low: ***the pupil shows some degree of activity and participates and interacts to some extent with the group after encouragement from other group members.***	• Contributes few ideas to the group, needs encouragement. • Shows some signs of engaging with responsibilities of specific role given. • Limited concentration: looks away during activity, fiddles, dreams. • Is easily distracted. • Few signs of exploration and interest.
3	Moderate: ***the pupil is busy the whole time, but without real concentration. The pupil generally participates and interacts with the group but still needs some encouragement from other group members.***	• Contributes ideas to the group, still needs some encouragement. • Generally shows signs of engaging with responsibilities of specific role given although is not absorbed in the role or activity. • Limited motivation, no real dedication, does not feel challenged. • Pupil does not gain deep level experience. • The activity does not address the child's imagination.
4	High: ***There are clear signs of engagement, participation and interaction with the group, but these are not always present to their full extent. The pupil will encourage others to participate at times.***	• Contributes ideas to the group and encourages others at times to contribute. • Engaged with responsibilities of specific role given and mostly there is real concentration, albeit during some brief moments the attention is more superficial. • The pupil feels challenged, there is a certain degree of motivation. • The pupil's imagination to a certain extent is addressed in the activity.
5	Extremely High: ***during the observation, the pupil is continually engaged in the activity and their specific role. They contribute and encourage others to contribute to the group. They are completely absorbed in the activity and their specific role in the group.***	• Readily contributes ideas to the group and encourages others to contribute. • Fully engaged with responsibilities of specific role given and there is real focus and concentration without interruption. • The pupil is highly motivated and feels strongly appealed by the activity and their specific role. • The pupil's imagination and mental capacity are in top gear. • Obviously enjoys being engrossed in the activity and the responsibility of their role.

Appendix 8

Responses to questions after lesson 2

Q1: Were you happy with your role during the lesson?
Pupil 1: I was the builder, but I didn't want to be the builder I wanted to be the designer. A member of the group told everyone what their roles would be.
Pupil 2: I was the organiser, but I wasn't happy because another member of the group kept taking over. This group member chose the roles for everyone. I would have liked to be the timekeeper/photographer because I like taking photos.
Pupil 3: I was timekeeper/photographer and was quite happy with my role. We choose our roles by voting and putting our hands up. I didn't want any other role.

Q2: What did you enjoy/not enjoy about that role?
Pupil 1: I didn't like this role because no one was listening.
Pupil 2: I didn't like the role because one of the other team members was taking over.
Pupil 3: I really enjoyed taking the photos.

Q3: Did having a role make the lesson more interesting for you?
They all agreed that having a role made the lesson more interesting, however, pupil 1 and 2 both would have preferred to have assigned roles by the teacher because they both had dominant personalities in their groups who dictated who did what roles. Pupil 3 did not agree with this because pupil 3 did not have the same experience of a dominant personality in the group.

Q4: What did you enjoy most about the lesson?
Pupil 1: Really enjoyed the planning and designing stage the most.
Pupil 2: Really enjoyed the planning and designing stage the most because you can get the design all into your head and are using thinking skills.
Pupil 3: Really liked the testing stage the best.

Q5: What would you change about the lesson if you could do it again?
Pupil 1: Would have liked to have chosen their own group with friends because they would have worked better as a team.
Pupil 2: Would have liked to have different materials to work with such as Lego and would have liked to use more eggs. They would have liked more time for the designing and building stages so that a more complicated structure with mechanical components could have been used.
Pupil 3: Would have liked more time for the building stage.

Q6: Were there any parts of the lesson you didn't enjoy and if so why?
Pupil 1: I didn't like my group because we didn't work well together.
Pupil 2: I didn't like my group for the same reason.
Pupil 3: I liked the whole lesson.