

How can we improve pupil involvement through the collaborative learning strategy of ‘think-pair-share’ in the Foundation Phase classroom?

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Introduction

Within educational research, approaches that encourage pupil collaboration have been recognised to facilitate primary school children’s learning and development (Johnson, Johnson and Smith, 2007). Teachers that employ opportunities for children to participate in collaborative learning (CL) within the classroom have been documented to increase pupils’ academic attainment (Johnson et al. 2007). Since the publication of Successful Futures (Donaldson, 2015), with recommendations to inform a new curriculum for Wales, Donaldson (2015) proposed that children should actively collaborate with their peers to construct meaning, make connections and take responsibility for their own learning. Despite this, previous classroom CL interventions have not been implemented successfully (Le, Janssen and Wubbels, 2017), specifically when CL opportunities have been intended to promote pupil involvement in classroom-based activities (Gillies and Boyle, 2010).

Based on the understanding of the pivotal role CL posed for primary school children’s overall development. Post discussion with my research partner, it was evident that CL opportunities within our placement school classrooms were minimal. Through conducting classroom observations, it was evident that pupil involvement and engagement in classroom activities were low, posing a detrimental influence on the pupils’ learning and development. Reflecting on our classroom experiences, was a motive to investigate whether implementing CL opportunities within classroom activities would increase participation levels of children.

Research context

The research project was undertaken in a large English medium primary school, in an urban town on the outskirts of Swansea. The school accommodates 365 pupils, aged from three to eleven years old. Approximately 23% of pupils have additional learning requirements and 28% of pupils qualify for free school meals. Most children have English as a first language and some children come from ethnic minority backgrounds (School Guide, 2018). Participants from the first research lesson were selected from a reception class of 26 pupils, aged 4-5 years. The participants in the second research lesson were selected from a year 1 class of 26 pupils, aged 5-6 years. This study intends to explore whether the CL strategy think-pair-share (TPS) is effective in improving pupil involvement in activities in the Foundation Phase (FP) classroom.

Literature review

Collaborative learning

CL is a learning and teaching approach comprising of small groups of learners working collectively to complete a task or achieve a common goal (Laal and Ghodsi, 2012). CL develops teacher-pupil relationships, promotes critical thinking skills, develops social interaction and increases pupil attainment (Laal and Ghodsi, 2012). The Education Endowment Foundation (2018) reported that CL opportunities significantly impact pupil achievements. This supports research that documents children's ability to solve mathematical problems increases when they work collaboratively (Kwok and Lau, 2015). Despite this, teachers find it

challenging to organise appropriate CL opportunities due to the time constraints of finding suitable CL activities (Gillies and Boyle, 2010).

CL supports the social constructivist approach to learning (Vygotsky, 1987). Vygotsky (1987) places emphasis on learning through meaningful social interactions with others, specifically interacting with a more knowledgeable other (MKO) within the *Zone of Proximal Development* (ZPD; Vygotsky, 1987). The ZPD is the distance between what a pupil can achieve with and without help (Vygotsky, 1978). CL can promote scaffolding within a learners' ZPD (Wood, Bruner and Ross, 1976). During scaffolding, a child obtains support from a peer or teacher acting as a MKO (Scott, 2008). The MKO supports a child's ability to access and build on prior knowledge and make sense of new information (Van Der Stuyf, 2002). Scaffolding can increase students' involvement in classroom activities (Abdullah, Hussin and Zakaria, 2013) and motivate children to remain on task (Van Der Stuyf, 2002); this is achieved through modelling behaviours and communication skills (verbal and non-verbal; Van Der Stuyf, 2002). Nevertheless, Li and Campbell (2008) identified that some children struggle to interact with peers and lack the collaborative skill of communication. Low collaborative skills, specifically social communication skills are one of the key implications for ineffective CL opportunities (Gillies, 2006). Therefore, it is essential to teach children the essential skills used to collaborate effectively with peers (Le et al. 2017).

Further research suggests that CL opportunities in primary school classrooms increase pupil participation in activities (Saunders, 2008). Saunders (2008) suggests that when children work in small groups, individuals become actively involved and take responsibility for their learning (Saunders, 2008). Peterson and Miller (2004) recognised that pupils are more involved when

working in small groups, as pupils are keen to share ideas with their peers. Saunders (2008) concluded that if pupils are motivated to learn, their involvement increases in CL activities. However, research demonstrates that primary school children fail to pay attention to peers' viewpoints and opinions, through interruption (Barron, 2003). Furthermore, inadequate grouping of pupils hinders social interactions and is detrimental to CL and pupil participation (Baker and Clark, 2010). If the occurrence of poor group cohesion is ignored it can negatively impact children's self-esteem (Saunders, 2008). To overcome this, pupils need to demonstrate a mutual dependence, be accountable to achieve the common learning objective and have existing social skills to collaborate in small groups (Woods and Chen, 2010).

Think-pair-share

TPS is a CL strategy that incorporates 'think time' and peer interaction to impact response quality (Saunders, 2008). TPS facilitates pupil communication and increases pupil involvement in group discussions (Rowe, 1974). Kothiyal et al. (2013) found that 83% of pupils were engaged and involved in classroom activities during the implementation of the TPS. However, data was gathered through participant observations and questionnaires, this is prone to subjectivity, reducing the reliability of results (Kothiyal et al. 2013). Kwok and Lau (2015) reported that TPS enhanced pupils' involvement in learning in year groups 4, 5 and 6, due to increased interaction, emotional support and positive group dynamics. However, due to the short time-scale of this study it is difficult to determine the reliability of these findings.

TPS commences with a teacher initiating an open-style question linked to the lesson topic. Open-style questions increase children's higher-order thinking and their ability to explain and

justify answers (Hayes, 2006). Open-style questions gather a range of responses from pupils (Hayes, 2006). Pupils are then provided with 'think time' to devise an individual response and draw upon their prior knowledge to develop a thoughtful answer (Saunders, 2008; Sampsel, 2013). Cortright, Lujan and Dicarlo (2005) recognise when children relate new information to existing knowledge, effective learning occurs. However, teachers fail to provide enough time for pupils to respond to questions (Saunders, 2008). Bond (2008) identified that teachers only wait for 0.9 seconds before probing an answer in response a question. Increased wait time contributes to thoughtful pupil responses and enhanced pupil involvement to questions asked (Rowe, 1972; Price and Nelson, 2007).

Then in pairs, children discuss individual judgements and see if they can come up with a conclusion based on the question (Sampsel, 2013). During this stage, scaffolding comes into play. Research shows, when children have the chance to talk and discuss verdicts with peers' involvement increases; specifically, in hesitant pupils as they can rehearse their answer with peers prior to speaking in front of the class (Nunan, 1999). Sampsel (2013) supports Nunan's (1999) findings and recognised when ideas are shared with a partner, children were more likely to voice their ideas and opinions. Syaffi (2018) identified pupils are eager to respond to a question after they have consolidated with peers, due to formulating an accurate response collaboratively following reflection and discussion. Syaffi (2018) found that implementing TPS increased pupil involvement from 29% to 78%. However, the sample size of this study was small (n=26), therefore it is difficult to generalise these results (Syaffi, 2018).

In the final phase of TPS, the class reunites, and individuals voice their findings with the class (Sampsel, 2013). Teachers use this stage as a form of formative assessment to gain an

understanding of pupils overall understanding (Cooper and Robinson, 2000). Through formative assessment, teachers can apply this understanding to adapt instruction to suit learners needs (Boston, 2002). Research demonstrates that after children have shared their thoughts with their peers, they are more inclined to participate in sharing their ideas with the class (Sampsel, 2013).

Previous research has utilised TPS in a Key Stage 2 classroom setting (Saunders, 2008) and in a higher education context (Lange, Costley and Han, 2016) and found that TPS increases pupils' involvement levels. Research surrounding CL in the FP classroom has demonstrated that CL increases participation levels (Arterberry, Cain and Chopko, 2017), however, no research has explored the use of TPS in a FP classroom (ages 3 to 7) to increase pupil involvement. Based on the above findings, I believe that TPS will improve pupils' involvement levels in the FP classroom.

Methodology

Lesson study design

Dudley's Lesson Study (LS) model was applied to discover whether the CL strategy TPS positively influenced pupils' learning and involvement levels (Dudley, 2011). The Japanese approach of LS is a representation of action research set out to advance teacher practice. LS utilises teacher observations, reflection and feedback (Murphy, 2017). LS encourages teachers to reflect on their pedagogical practices (Mason, 2002), providing teachers with the opportunity to enhance their understanding of learning and teaching approaches (Dudley, 2013). Hadfield,

Jopling and Emira (2011) recognised LS had a positive impact on pupil attainment. However, this study did not consist of a follow-up design, therefore the long-term benefits of LS were unclear. The Education Endowment Foundation (2017) found that LS had no impact on pupils' attainment levels in maths and reading in Key Stage 2. Nevertheless, this study only examined the effects of the LS design on year groups 4 and 5, therefore, these results cannot be generalised to the whole primary school population. Furthermore, outcomes were assessed using teacher observations and interviews. Due to the subjective nature of participant observations and the potential for subconscious bias during interviewing's (Alshenqeeti, 2014) the reliability of the result is questionable.

The LS design utilised a triangulation of methods to ensure validity through analysis of information from different sources (Carter et al. 2014). To initiate the LS design, a research lesson was collaboratively planned with a research partner that addressed the key research objective of the study. Teacher collaboration is a key aspect of the LS design that enables teachers to become more aware of a variety of individuals needs within teaching (Dudley, 2011). Donaldson (2015) recognised that effective planning and pupil success occurs when teachers collaborate with other teachers. However, time constraints of teachers and individual accountability pressure (Armstrong, 2011) indicate that teachers cannot fully commit to the LS process (Mon, Dali and Sam, 2016). With reference to the present studies research design, this suggests that LS can only make a minimal impact on target pupils' involvement through the TPS strategy. Furthermore, due to the short time-scale of this study (2 days), reliability of results is reduced. Dudley (2014) states that professional learning cannot be a one-off occasion, it takes time to be developed.

An event sampling method was used to observe the research lesson, this is a valid tool for gaining details of children's behaviour (McMillan and Schumacher, 2006). Details of the observed event included content, event time and participants involved (MacNaughton, Rolfe and Siraj-Blatchford, 2010). Due to the subjective nature of tracking pupil involvement (Laevers, 2015), during the research lesson pupil involvement was observed, tracked and recorded using a mixed-methods approach incorporating The Leuven Scale for Involvement (LSI; Laevers, 2005). The LSI utilised quantitative and qualitative forms of data collection. Qualitative data aids in attaining information based on learners' involvement and behaviour (Angers, 1997). Whilst quantitative data increased researcher credibility when interpretation findings. The LSI is a recording checklist 5-point scale that measures different involvement measures represented through activity and concentration levels (see Appendix E). The LSI is a reliable method of data collection that utilises standardised numerical data (Oluwatoyin and Sia, 2016). The checklist style of the LSI ensured that researcher and observer were alerted of cues in behaviour (Oluwatoyin and Sia, 2016). A high level of involvement corresponds with greater benefits to pupils' learning and development. The LSI is a simple approach to trace numerous children at once. However, pupils' behaviour changes if they are aware they are being observed (Hobart, Frankel and walker, 2009). To overcome this, it was essential that pupils were unaware of observations.

Post research lesson, three target children were interviewed in a focus group structure, to gain feedback on the effectiveness of TPS on pupils' involvement. A focus group is a form of qualitative data collection and a valid approach to gain a large amount of data from a small sample size (Lasnami, 2015). During the focus group, participants were asked open-style questions. Open-style questions discovered a variety of responses from pupils (Hayes, 2006), increasing the reliability and validity of results. The focus group structure triggered responses

from participants and additional comments from others, gathering a variety of different information (Glitz, 1998). However, due to the researcher being unskilled in conducting focus groups, the ability to draw out information from participants was limited (Krueger, 1993). To overcome this, in preparation for the focus group, a pilot study was conducted on three student teachers prior to entering the school and then for a second time with the class teachers. Interview questions were then adapted to suit the target sample within the school (see Appendix I).

An audio recording device was used to capture the detailed conversations between participants and researcher in response to questions ask in the focus group. Audio recordings ensured an accurate representation of data and reduced the risk of researcher bias when transcribing responses. Digital files of audio recordings are not prone to getting damaged (Tessier, 2012) and data can easily be backed-up. However, transcribing audio-recordings was time consuming (Tessier, 2012). Furthermore, when transcribing audio recordings, participant anonymity was essential to maintain confidentiality (Halej, 2017). Additionally, emotional details were lost when transcribing results from audio recording, such as laughter or silence in true representation (Tessier, 2012). My future practice will utilise a video sampling method to encapsulate the interaction between the researcher and pupils during the focus group (Papathodorou, Luff and Gill, 2011). Although video recording can be intrusive, it will provide an accurate portrayal of events prior to data analysis (Papatheodorou et al. 2011).

My research partner and I collectively reflected on observational findings utilising Brookfield (1995) and Gibbs (1988) reflective models (see Appendix L and M). Reflection enabled us to focus our thoughts, make sense of experiences, develop ideas and learn from the experience.

The first model used to reflect was the Brookfield (1995) lenses model. Brookfield found that teaching can be reflected on using four lenses: self-reflection (own experience, reactions and feelings), reflection on pupils (consider the pupils reactions), our research partners reflection (research partners observation of your work and what you could improve on) and research that can make sense of the experience. Brookfield (1995) lenses model increases awareness of the effectiveness of both teaching and the strategy from multiple viewpoints. By reflecting on our personal practice from different perspectives, this enlightened us to areas of the teaching and learning experience that could be developed. Reflection using Brookfield's lenses model (1995) provided a critical analysis of the effectiveness of CL strategy (Brookfield, 1995). However, Brookfield's (1995) reflective model fails to consider future action and targets drawn from reflection.

Within the self-reflection lens of Brookfield's model, Gibbs' (1988) reflective cycle was used to enhance personal reflection. By doing so, it was possible to reflect on the event alongside personal thoughts and feelings. Within Gibbs' reflective cycle it was possible to evaluate and make sense of the situation, draw conclusions and form an action plan to inform future teaching. Gibbs (1988) reflective cycle enabled me to make sense of an experience, identify aspects to adapt and develop to improve a strategy. Although Gibbs reflective cycle (1988) fails to draw focus on critical thinking or views of reflection from different perspectives, Brookfield's model (1995) overcomes this criticism.

Procedure

The LS design consisted of two LS cycles and two research lessons (see Appendix A and B), one research lesson within each cycle. The LS cycle spanned over two consecutive days. Research lessons were collaboratively planned, observed and then analysed by two researchers. At the end of cycle two, conclusions were gathered from the application of the LS design based around discoveries, with reference to the research and lesson objective.

Observational data was recorded and analysed using the LSI observation checklist sheet. The research lesson was 40 minutes in duration. Observational recordings were obtained every 3-minute interval between the lesson start and end time. Each target pupil was observed at 10 time-points. The observer recorded each participants involvement level utilising the LSI numbers 1-5. After each research lesson, focus group transcripts were analysed by drawing out common themes displayed within the focus group transcripts. Themes related to enjoyment of the activity and feelings towards working with peers.

Participants

Two classes participated in the research study based in one large English medium primary school on the outskirts of Swansea. The first set of participants (n=14, 7 males, 7 females) were recruited from a reception class of 28 pupils. The second set of participants (n=8, 7 males, 1 female) were recruited from a year 1 class of 26 pupils. Three focus children from each participant group were chosen to be a representative sample for research and data collection. With the support of the class teachers, children were selected based on their previous involvement levels in class-based activities. The selected focus children had previously

displayed low, medium and high levels of involvement in classroom events. It was vital to display variation in baseline involvement levels between participants.

Martinez-Mesa et al. (2016) suggested by having a varied target group, based on the obtained results, conclusions can be drawn regarding a specific target population with increased reliability. If a sample does not show variation, it reduces the reliability of results gathered, this makes it difficult to draw assumptions about a population (Martinez-Mesa et al. 2016). It is essential that participants are selected with relevance to the research objectives and not chosen at random (Martinez-Mesa et al. 2016). If a sample is not a true representation of a target population it is recognised as sampling bias.

Dudley (2011) recommends three research pupils, however, Martinez-Mesa et al. (2014) states that a small sample size reduces the reliability of results. Nevertheless, research suggests, a small sample size is enough to be a representative sample to a small specific target population (McLeod, 2014). Furthermore, research suggests that qualitative data analyses utilises a smaller sample size compared to quantitative data analysis. In scope of this research study, the qualitative sample size should be enough to gather data to represent findings from the research question. Within this study, I believe that adding additional participants would not impact the results (Glaser and Strauss, 1967).

Ethical considerations

Data collection, analysis and the propagation of research findings (Denscombe, 2004) were supported by guidelines proposed by the British Educational Research Association (BERA, 2018) Ethical Guidelines for Educational Research and the University of Wales Trinity Saint David (UWTSD, 2019) Research Ethics and Integrity Code of Practice.

Participants should not be placed at risk when involved in a research study (Denscombe, 2004). It was key that participants in the study were protected by ensuring confidentiality of their information and anonymity of their identity. To reduce risk to participants the school name, teachers and pupils involved were reported as anonymous. Children were represented with codes as pupil A, B and C. All participants were made aware of the degree of anonymity and confidentiality prior to research study commencement. It was essential that methods of data collection did not place any psychological trauma on participants or impact their academic achievement. Participants were notified prior to study commencement that they could withdraw from the study at any point.

All participating children received informed consent from a parent or legal guardian (See Appendix C) and provided assent to participate in the study (See Appendix D). Assent was provided by participants signalling a colour coded card to represent their involvement in the study. Assent was observed by the class teacher. Participants were excluded from the study if parent or guardian informed consent, and participant assent failed to be obtained.

Falsified or fabricated data could be detrimental to the research school and universities partnership. To avoid possible risks, permission was obtained by the school headteacher after a formal meeting to discuss the research proposal in detail. To avoid the risk of bias

information, no information within this study was falsified and all data collected was a true representation of observed events. All researchers involved within this study followed the correct guidelines displayed within the schools safeguarding and child protection policy. Research was conducted in accordance to UWTSD Research Ethics and Integrity Code of Practice (2019) to minimise potential for claims of negligence made against the university, its researchers and any collaborating researchers.

All data collected for the study was detained by secure means to protect the integrity, confidentiality and access of data. Data protection was ensured by abiding by the UWTSD Research Ethics and Integrity Code of Practice surrounding data security and archiving and the UWTSD group data protection policy.

Results

Lesson 1

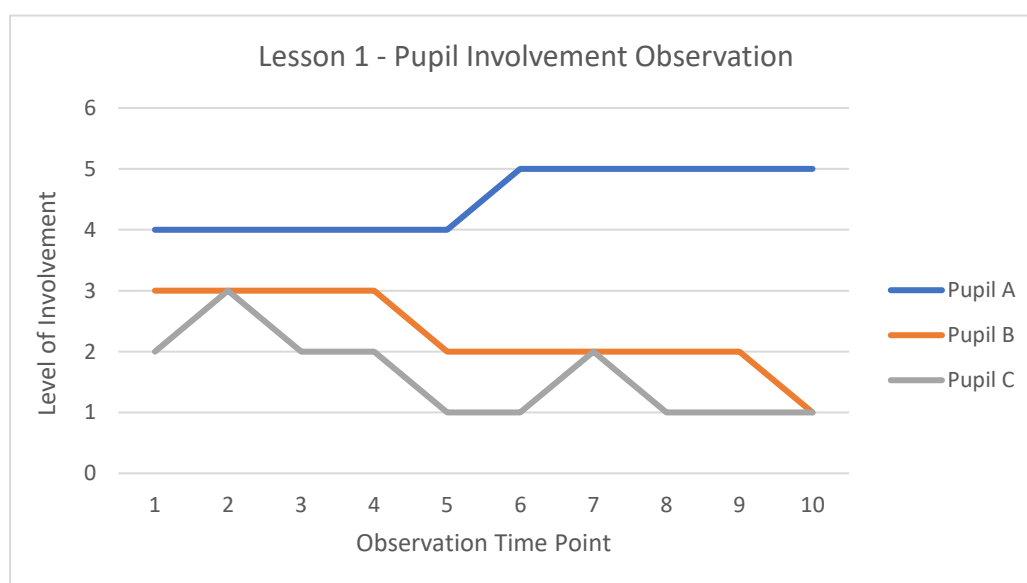


Figure 1- Data obtain from The Leuven Scale for Involvement checklist for lesson 1.

Data gathered from the LSI from lesson 1 identified level of involvement during TPS varied over 10 observation time points for each target pupil (Figure 1; Appendix F and H). Initially, each child had a level of involvement in the activity above level 1 (extremely low involvement). Pupil A displayed the highest involvement level, pupil C displayed the lowest initial involvement level and pupil B displayed a moderate initial involvement. Throughout TPS, pupil A displayed a moderate to high maintained involvement level. Pupil B's level of involvement in the CL activity decreased as the lesson progressed. Whereas, pupil C's level of involvement fluctuated between moderate to low involvement. Analysis of the transcript obtained from the focus group revealed that pupil A had a clear grasp on the learning objective of the lesson. All pupils could identify features of the topic they covered in the lesson (emotions). Pupil A demonstrated working with a peer made them feel confident but did not like that their peer kept changing their mind. Pupil B enjoyed working with a peer. Pupil B and C's involvement in the focus group was low (see Appendix J).

Discussion – Lesson 1

CL opportunities within the classroom promote opportunities for students to interact through pupil interdependence and have contributed to higher levels of involvement and participation (Herrmann, 2013). Pupil interdependence refers to pupils relying on each other to achieve a common goal (Johnson and Johnson, 2009). However, results from the first research lesson did not coincide with these findings. Results gathered from the LSI demonstrated that pupil B and C involvement levels decreased over-time when TPS was implemented. However, after comparisons were made between the present study and Herrmann's (2013) research,

differences were apparent in sample group age. Herrmann (2013) used TPS to target pupils in higher education, whereas my research targeted FP pupils. Similarly, Kwok and Lau (2015) recognised that pupils in year groups 4, 5 and 6 were actively involved in class activities during TPS. This suggests that older pupils are more responsive to TPS as a CL strategy. After reflecting on this lesson with my research partner, it was agreed to apply TPS into a class of older children in the second research lesson to determine if this influenced the effectiveness of TPS on children's involvement levels.

It was evident that pupil B and pupil C demonstrated signs being of distracted and disengaged from the activity (see Appendix F). Distraction can be defined as the inability to focus on a task. The level of distraction evidently had a negative impact on the participants involvement during TPS, as participants demonstrated low (pupil B) and extremely low (pupil C) levels of involvement. The social-constructivist theory can underpin the lack of impact the CL strategy had on pupil B and C's involvement levels. Firstly, it could be suggested that pupil B and C found the activity too easy. When reflecting on the lesson, the lesson's activity surrounded a topic that children had previous experience and understanding of. Research shows, if a task is too simple, children get bored and disconnect from the activity (Vygotsky, 1978). Verenikina (2008) support this finding but suggests, for scaffolding to be successful within the ZPD, the activity needs to be a task that children cannot complete unaided. However, the task cannot be set to be too challenging, as children may become frustrated and avoid participating in the activity (Vygotsky, 1978). Oluwatoyin and Sia (2016) identified if a learning environment suits the child's needs, they will be more engaged and involved in the learning experience. Therefore, within my future practice, I will set children challenging activities based on their prior knowledge and ability level. By doing so, I will expect to see children's involvement

levels increase as children will be functioning at the optimal limit of their capabilities (Oluwatoyin and Sia, 2016).

Pupil C demonstrated the lowest levels of involvement over each time-point (Figure 1). It was evident through participant observations that pupil C was happy to let their peers control the CL activity and pupil C would refrain from answering questions. Furthermore, pupil C had limited input into the responses to the questions in the focus group. It could be suggested that pupil C was susceptible to social loafing. Social loafing is demonstrated when individuals elicit reduced effort when in a group compared to working individually (Le et al. 2017). When pupils work in a CL environment, pupils were aware that others would complete the work regardless of their input, therefore pupils' involvement in the activity reduced (Le et al. 2017). This contradicts evidence to suggest that children's involvement increases (social facilitation) when they are in a group environment (MacCracken and Stadulis, 1985). However, Le et al. (2017) findings were obtained from interviews with teachers who had little experience of CL, this reduces the reliability of claims made. According to Harkins (1987) social loafing occurs when children believe that they are not being evaluated for their individual input when working in a group. If participants feel as though their input is undervalued, their motivation and consequently their involvement decreases (Harkins, 1987). Arterberry, Cain and Chopko (2007) supported Harkins (1987) findings and found that 5-year-old involvement and performance increased in CL activities when they were aware that their performance was being evaluated. Arterberry et al. (2007) recognised when teachers said to the children *I want to see how good you are at doing that* was enough to make children aware they were being evaluated. Therefore, within my future practice, I will use evaluative language such as *I have seen how well you can do that*, to increase children's involvement in CL activities.

Through participant observations, it was evident that pupil A and pupil B refrained from sharing information with their peers, and each pupil at some point throughout TPS activity refrained from sharing their thoughts with the class. These findings conflict with previous research which suggests that when TPS is implemented in the class room, pupils are more inclined to express their thoughts to the class after their response had been discussed with a partner (Sampsel, 2013). Similarly, Kwok and Lau (2015) found that TPS reduced pupils' anxiety towards sharing thoughts with peers and communicating in front of the class. This was due to children having the chance to rehearse and process answers prior to speaking in front of the class (Kwok and Lau, 2015). However, Kwok and Lau (2015) study was a small-scale study over a short time period (5 months), this reduces the reliability of these findings. However, research demonstrates when class size is reduced, children received personalised instruction, less time focused on classroom management and greater student engagement in learning; all of which contribute to enhanced student attainment (Anderson, 2000). The American Education Research Association (2003) revealed that reducing class size in reception and year 1 classes, reduced children's perception of participation pressure in class activities and increases pupil involvement. Therefore, within lesson 2, it was essential to reduce the class size to determine if this influenced the effectiveness of TPS on pupils' involvement levels.

Results

Lesson 2

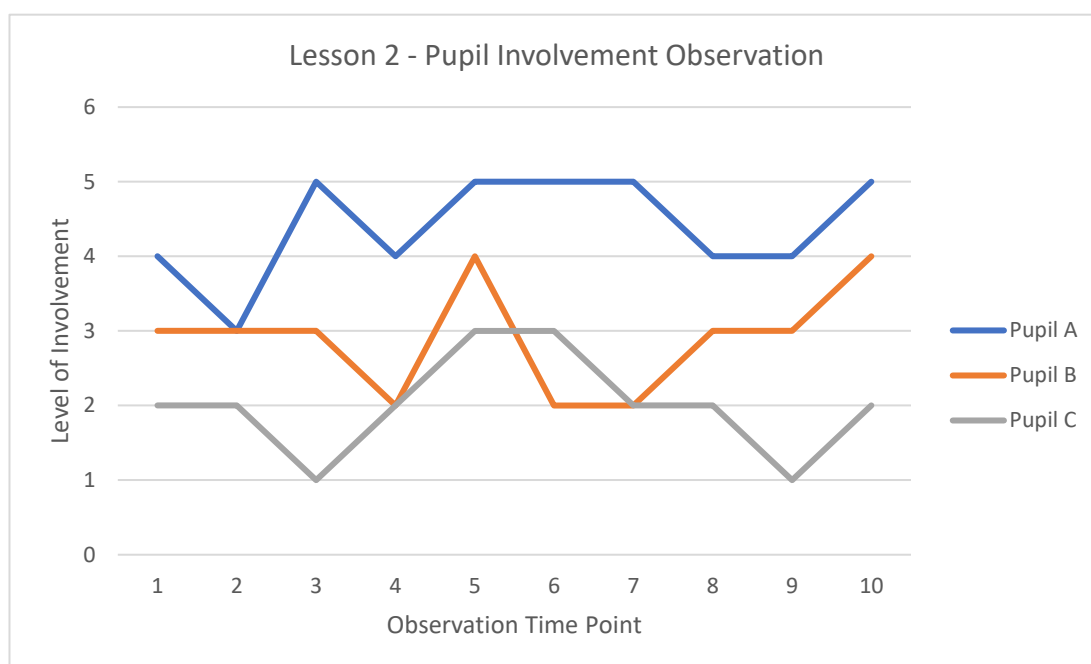


Figure 2- Data obtain from The Leuven Scale for Involvement checklist for lesson 2.

Data gathered from the LSI for lesson 2 identified, level of involvement fluctuated over the course of the research lesson for each participant (Figure 2; Appendix G and H). Each pupil started the lesson with a level of involvement of low involvement and above. After the preliminary introduction of TPS, level of involvement decreased for pupil A and plateaued for pupil's B and C. After an initial drop in activity levels for pupil A, level of involvement fluctuation between a high level of involvement and extremely high level of involvement for the remaining duration of the activity. Throughout the CL activity, pupil C displayed fluctuated levels of low to moderate levels of activity. Whereas, pupil B demonstrated low to high levels of involvement. Analysis of the transcript of the focus group revealed that pupil's A and B enjoyed the implementation of TPS when they had the chance to talk to peers (see Appendix K).

Discussion – Lesson 2

Lesson 2 had a greater impact on pupils' involvement compared to lesson 1 (Figure 2). Pupil A displayed moderate to extremely high levels of involvement during TPS at each monitored time-point. Pupil B also experienced high levels of involvement during TPS. Participant observations demonstrated that pupil A was very enthusiastic to respond to questioning, and information from the focus group demonstrated that pupil's A, B and C enjoyed sharing their thoughts with peers. Research shows that children enjoy working together (Sampsel, 2013) and are more motivated when working together on activities (Price et al. 2003). Johnson and Johnson (1989) findings support this by recognising participants feel happy and gain satisfaction when working together and helping others to succeed. Research from this study coincide with findings that demonstrate CL increases children self-esteem and sense of belonging (Muttaqin, 2016). Nevertheless, research by Price et al. (2003) and Muttaqin (2016) was obtained using an observational approach. Due to the subjectivity of observational methods, it is difficult to draw conclusions from these results (Coe et al. 2014). However, research demonstrates (Saunders, 2008) that if pupils are grouped with children they do not get along, it could hinder their involvement in the activity and reduce their enjoyment of participating in the task. Saunders (2008) recommended grouping children with peers that they have previously had experience of group work together as they have an existing level of collaborative rapport. Berry (2003) expands on Saunders (2008) findings and demonstrates that groups should be mixed ability and consist of varied pupil motivation levels. Collaboration between children of mixed ability levels encourages children to listen, ask questions and respond to ideas, this increases involvement and interaction (Vygotsky, 1978). Therefore, my

future practice should seek to pair up peers prior to implementing TPS in the classroom to achieve optimal interaction to enhance involvement levels.

Involvement levels displayed by pupils A and B varied greatly throughout the implementation of TPS. Observational records suggest that both children were eager to answer questions posed by the teacher, but at some time-points (time-point 4), both children refrained from answering questions and involvement levels reduced. Participant observations revealed that pupil C was hesitant about answering questions at time-point 4. Reinhart (2000) stated that when wait-time is reduced between questions children can doubt their knowledge and refrain from answering questions. Evidence suggests that wait-time of 3 or more seconds after a question has been asked is beneficial to children as it increases the quality of pupils' responses and allows more children to be involved in a response and class discussions (Rowe, 1972). In contrast, Reinhart (2000) recommends extending wait-time to 5 seconds after a question is asked. Increased wait-time allows children to process their thoughts (Reinhart, 2000), deliver response quality and increase participation (Tincani, 2012). However, due to the small sample size (2 children) of Tincani's (2012) study, this outcome cannot be generalised across the FP population. However, evidence suggests that children who are competitive and are used to quick-fire responses to questions will not benefit from the implementation of wait-time (Kelly, 2018). Research suggests that children would benefit from practicing the process of wait-time in the classroom (Kelly, 2018). Therefore, within my future teaching, I will reinforce the application of wait-time after a question is asked. I will then wait in silence for 3-5 seconds prior to asking children to volunteer an answer.

Pupil C displayed the lowest levels of involvement throughout the application of TPS. Data gathered from the observation and focus group demonstrated that pupil C had limited social communication skills and lacked confidence in social interactions with peers. Although TPS is designed to increase participants involvement levels through social interaction (Kothiyal et al. 2013), research shows that children in primary schools have low collaborative skills that enable them to communicate effectively (Le et al. 2017). Stipek et al. (1998) identified that at the age of 5, children have just entered formal education and have limited skills to collaborate effectively with peers. If children have limited collaborative skills to work and play together in small groups, it can result in reduced enjoyment, motivation and involvement levels in future collaborative tasks (Persson n.d.). Data from Persson's study was gathered through video analysis. Video analysis provided a true account of observed events, enhancing the reliability of the study (Persson n.d.). Oluwatoyin and Sia (2016) reinforced that children need to have social interaction to develop social skills. Gummer (2012) recommended role play as a great activity for children to develop social skills such as communication, toy sharing, taking turns and encouragement to support CL. A school in South-Wales has set up a buddy system in school, year 6 children pair up with reception children to provide support throughout the school day (Estyn, 2018). This initiative enhanced children's communication skills and peer interactions across the school (Estyn, 2018). Therefore, my future practice will seek to develop an atmosphere within the school that gives children a chance to develop a wide range of skills that help foster collaboration.

Limitations

The possible implications to the reliability and validity of results and the limitations of this methodology have been deliberated throughout this research project. However, the main fault in this research design was the time constraints of the study.

The time limitation was linked to the time-frame of the LS design. Whilst the present study was a short-term action research study, spanning over two consecutive days, consisting of two lesson study cycles, previous research had advised LS needs to be ‘built into school systems’ and recommends three lesson study cycles (Dudley, 2014). By allowing a longer time-scale for the implementation of the LS design, greater opportunities can be devoted to planning the LS lesson, teaching, observation and reflection. Dudley (2011) suggests that time should be created within the school day for teachers to plan and reflect on their lesson collaboratively. Kanellopoulou and Darra (2018) found that enhanced time to plan and prepare the research lessons significantly enhanced the implementation of the LS design. Kanellopoulou and Darra (2018) recognised when teachers had enough time to discuss the features of the LS design, they could ensure the strategy was delivered in the best way. Lewis, Perry and Murata (2006) identified that LS needs to be applied over a long time (years) to impact professional development. Fujii (2014) proposed a research lesson should be designed over 6 months, whereas Fernandez (2002) states that 10-15 hours over 3-4 weeks should be devoted to designing and planning a research lesson. Fernandez (2002) states that the structure of the national curriculum should allow time to allocate for teachers to collaborate, plan, teach, observe and reflect on their LS design (Fernandez, 2002). Dudley (2011) suggests an allocated time within the school day such as PPA time, break times and staggered timetables should be provided to allow teachers time to collaborate and communicate thoughts and ideas. Following this, future research should seek to conduct the present studies LS design over a longer period to increase the reliability of the results obtained.

Conclusion

This research study set out to investigate if it was possible to improve pupil involvement through the CL strategy of TPS in the FP classroom. The literature review revealed that the social constructivist theory could underpin the fundamental formation of learning in collaboration, through social interaction with others and formulating an environment that fosters problem solving (Vygotsky, 1978). The primary school was an ideal environment to deliver opportunities for children to participate in CL strategies, specifically the CL strategy of TPS (Kothiyal et al. 2013). By applying the action research approach of LS to address the research question, it was evident that the CL strategy TPS increased involvement levels of pupils in the FP. It was evident that the target pupils' participation and involvement levels increased because of TPS due to enhanced enjoyment, enthusiasm and motivation when collaborating their thoughts and ideas with peers (Sampsel, 2013). Despite this, specific collaborative components of the TPS strategy negatively impacted individual pupils' involvement levels. The peer collaboration constructs the underpins the TPS strategy caused reduced involvement levels in some participants. Furthermore, it was evident that some participants were prone to social loafing due to the implementation of TPS. This resulted in reduced involvement levels when target pupils were working with peers.

Applying the LS design to this research has allowed me to review the constructs of the methodology to inform future research and my future teaching. Within future research, it would be essential to conduct the LS design over an increased period to allow for a more thoughtful application of the LS design process, this will increase the reliability of results. This study

would also benefit from an increased sample size, to determine if adapting the sample size would impact the results obtained. Furthermore, within future research, a video sampling method should be adopted to capture participant interactions to reduce the possibility of observer bias when analysing data. Within my future teaching, prior to conducting a lesson, I will ensure that lessons are planned with awareness of pupils' prior knowledge at the forefront, by doing so a lesson can be planned that provide pupils with challenge to ensure that they are functioning at the optimal limit of their capabilities. Within my future teaching, I will initially utilise TPS in a small classroom environment to reduce pupils' perceptions of participation pressure and increase involvement levels in CL opportunities. Within my future teaching, when implementing CL opportunities within the classroom, I will ensure that children are aware that individual involvement within the activity will be evaluated in relation to the learning objective and success criteria. Furthermore, within my future teaching, prior to the implementation of TPS, I will foster a classroom environment that promotes the development of social skills through peer interaction. By doing so, pupils in the FP will learn the essential social skills needed to participate and become involved in CL opportunities and obtain the desired benefits from participating collaboratively with peers.

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