

How can we improve pupils' engagement in Assessment for Learning through the use of a 'no hands up' strategy?

In research, there is a common argument that professional learning can only be effective when done over the long term and in a setting that promotes teaching and learning as social and collaborative (Saito, 2012). From this we can gather that assessing teaching is required to ensure this professional development is happening. Due to time-consuming responsibilities, a method practitioners can undergo to conduct research is a lesson study, due to its flexibility. According to recent research, there is a vital need for practitioners to undergo Continued Professional Development (CPD) through a process that is deemed flexible due to the intense demand of teaching (Chassels, C. and Melville, W., 2009). It is suggested that this research method offers us with opportunities to shape professional learning groups, broaden perspectives of relevant pedagogy and curriculum and lastly to ensure teachers are improving their 'habits of critical observation, analysis and reflection (Chassels, C. and Melville, W., 2009: 2). The growing use of this research method and its' impact on pedagogy practice will be the focus of this essay. Also, the purpose of including a literature review is to explore and evaluate findings and issues that have been recorded in line with lesson study as a form of research in the classroom. To ensure we have a well-rounded understanding of lesson study, this paper will also analyse on how practitioners can utilise lesson studies to research how pupils' engagement in Assessment for Learning (AFL) can be increased through a 'no hands up' strategy. This hypothetical research activity will enable us to identify the benefits and challenges posed by lesson study in attaining the relevant data. In addition, by utilising a research question this will offer us a better understanding of the processes involved in lesson study and how they can enhance a practitioner's self-knowledge. To conclude, the exploration of a lesson study as a form of research will take place in line with ethical considerations due to this research occurring in a school setting.

Lesson Study's Theory

Before we evaluate literature surrounding the benefits and challenges of lesson study, we must develop our understanding on the Japanese form of research, its purpose and the theories behind it. Lesson study became internationally known since the release of Stigler's and Hiebert's (1999) paper that announced its value in highlighting why some systems are achieving a lot higher than others. The Japanese form of research tasks practitioners to broaden each other's self-knowledge and self-evaluative mindset through observing one another teach. A lesson study involves and relies on live observations that take place by a group of teachers (Dudley, 2014). The process involves the gathering of information and then a collaborative analysis of the collected data (Lewis et al, 2009). Lesson study has been

described as a form of research that involves the following four processes: creating goals and the research focus, collaborative research for the planning of lessons, delivery of plans in a live observational setting and lastly, a social reflection that involves all relevant practitioners (Fernandez and Yoshida, 2004). In the same article, it is suggested that credible lesson studies are those that are carried out in the long term, meaning that practitioners are constantly revising and refining plans in accordance with what was identified during the collaborative reflection (Saito, 2012). According to lesson study expert, Dudley defines the process as consisting of 'at least three research lessons that are jointly planned, taught, observed and then analysed by a group' (Dudley, 2014: 5). From this we can understand that this type of reflection allows for thorough analysis of a topic due to the different information collected from diverse perspectives over the long term.

To deepen our understanding further, it is significant to note that there are two methods of carrying out a lesson study. The first method is carried out through a top-down approach, meaning that members of that schools' senior leadership team will carry out the processes to ensure that performance management is being assessed and refined. According to research, a top-down approach in any sort of process or planning ensures that targets are identified early, and these are determined by executive perspectives (Bower, J. L. 1974). When researching executive input in lesson study, we are faced with implications, especially when viewed from an international viewpoint. Boonsena, Inprasitha and Sudjamnong (2019) illuminate that schools in Thailand do not have senior teachers in place, thus, meaning that any lesson study conducted there is without the crucial factor of senior expertise. This barrier means that Thailand is at a huge disadvantage when attempting to enhance their teaching profession, in comparison to systems in Japan for example, where expert teachers offer their experience to those who are seeking to professionally develop (Boonsena, Inprasitha and Sudjamnong, 2019).

The second approach to lesson study then, defined as a grass-root method, consists of same level practitioners carrying out the collaborative process to contribute to each other's professional learning and development (Inagaki, T. and Sato, M. 1996). Whilst this method is without executive input, it is articulated that this sort of approach, to any planning, results in an increased motivation as decisions are made by those most affected by the outcome (Bower, J. L. 1974). Whilst this approach to lesson study is suggested to be tremendously effective in sharing the same agendas and developing professional relationships (Archer, 2016), others

argue that this collaboration can only be beneficial if all participants are openminded to different perspectives being shared (Hart and Carriere, 2011).

A common speculation that arose during research was the questioning as to why experts are placing so much responsibility on practitioners to develop their skills using research (Gutierrez, 2015). When exploring reasonings to this notion, specifically in Wales, it was found that PISA records rank the nation significantly lower than other British jurisdictions (Wales Online, 2019). In line with this, OECD conducted an enquiry that reported on how we can improve Welsh education and a common sentiment shared is that there is a crucial need to enhance a more well-researched culture in schools (OECD, 2014). In the same article, it is proclaimed that this vital need to create a more researched educational setting must stem from a professional community that works together effectively (OECD, 2014). Similarly, the Welsh Government had announced that their hopes for teachers are to be research-competent, informed and developing from experience (Welsh Government, 2017). In the same way, this objective is supported by Graham Donaldson, who aspires for the teaching profession to have 'sound understanding of the 'why' and 'how' of teaching as well as the 'what,' (Donaldson, 201: 71). Subsequently, we can understand why there is a need for schools to participate in more research and by using methods like lesson study, evidence presents that there is an incredible improvement in understanding the how behind teaching and learning (Huang, R. and Shimizu, Y., 2016). From this we can gather that the reasoning behind lesson study being used so much is because educators improve their understanding of student learning, thus, resulting in teachers being able to utilise these new findings to inform and shape pedagogic decisions.

Furthermore, we continue to understand the significance of practitioners undergoing social research as a way of enhancing practice as highlighted in the British Educational Research Association (BERA) is that the research capabilities of a teacher is most crucial in developing a self-evaluative and forever improving education system (BERA, 2014). Their enquiry also states that self-improvement processes undertaken by schools should be collaborative, and this should become the normal routine in all teaching and learning (BERA, 2014). BERA illuminates the need for teachers to work more promptly together and interestingly, research commonly titles this type of improvement as Joint Professional Development (JPD) as it should involve investigations that are deemed as collaborative (Hargreaves, 2012). JPD allows colleagues to illuminate aspects of an individual's practice that they may not have been originally aware of (Dudley, 2011). However, although our findings favour teachers working together, there are rising concerns that address the issue on isolated practitioners. It is stated

that practitioners who often spend most of their time alone in their classrooms are depriving themselves of the opportunity to develop in a way that is considered highly effective (Stigler and Hiebert, 1999). For Hiebert especially, isolated practitioners will lack in professional development as it is suggested that expertise should consist of a planning and reflection process that combines own teaching and that of other educators as well (2017). There seems to be a recurring title that focuses on collaboration in schools, some often defining it as a social community (Saito, 2012). It is important to pay attention to Saito's use of language as a demonstrates the effectiveness in creating an establishment that promotes and encourages its colleagues to work together. Essentially, we can gather that teachers obtain crucial skills through that of their colleagues' practice and experiences, often recycling effective methods and refining those that may need improvement (Barth, 1990). Besides that, it is also proclaimed that teacher development should be social because effective practice enhancement stems from challenging common routines and drawing on the perspectives of others to identify discrepancies (Cochran-Smith and Lytle, 2001). In hindsight, research suggests teacher practice is most enhanced when done collaboratively and ultimately this viewpoint outperforms research that negates the opposition. In fact, there is very little statements that claim professional development is done best on an individual basis.

It is said that the most direct way to improve standards of learning is through developing teaching in the classroom (Dudley, 2014). In the same text, Dudley outlines the power that derives from effective lesson study in reforming the practice of teachers, whom can be just as diverse in their learning styles as their pupils (Dudley, 2014). It is interesting to analyse to Dudley's choice of language when describing teachers as 'diverse,' however, continues by describing a lesson study's value due to participants differing in their pedagogy approaches (Dudley, 2014). Ultimately, Dudley helps us to understand how this method can make ideas and thoughts transparent, essentially causing lesson study to appear as a flexible and easy approach to CPD. Nevertheless, although research sides towards the benefits of lesson study, its flexibility is also argued to be one of its implications as well (Larssen, D.L.S 2018). The popular process of live observation can also lack clarity in its objectives. Research suggests far too many case studies are without precision, especially when stating what specific areas require attention during observation, resulting in the assumption that there is little understanding on how the process should be conducted (Larssen, D.L.S., Cajkler, W., Mosvold, R., Bjuland, R, 2018). From this we can gather that for a lesson to be effectively studied, all processes involved require careful consideration and thought.

Furthermore, it is recognised that the live observation process causes the most implications during a lesson study. Whilst this method can motivate teachers to collect data on the impact of their lesson on learners (Groves, S., Doig, B., Vale, C, 2016) there is a concern amongst theorists who question the accuracy of the gathered information. According to some researchers there is speculation surrounding live observations as some suggest that reports noted during this process may be biased and in the favour of their desired research outcome (Moyle, 2002). Similarly, it is claimed that reactivity during observation is another significant implication of lesson study. Shaughnessy (2003) argues that participants may adapt their characteristics when being observed by colleagues. In addition, research illuminates several implications to carrying out effective observation. To summarise, significant issues stem from interpersonal behaviour, familiarity between teacher and observer and general attitudes have the biggest impact on observation success (Kawulich, 2005). However, we can also understand the power observations holds, especially when gaining an insight into an aspect that may be difficult to describe through words (Moyle, 2002). The process of observation is considered a crucial factor of lesson study (Dudley, 2014), however, from what we have identified, participants must ensure that an accurate representation of their pedagogy is occurring and that all individuals involved have the ultimate clarification on what the focus is.

We can understand the purpose of lesson study and its reasoning behind it, however there are varied arguments that discuss the method's benefits and challenges. When assessing diverse lesson studies, Willems and Can den Bossche found (2019) that it was an extremely powerful source in developing practice, adding that a significant improvement was reported as a result of examining teachers. We recognise that this approach allows us to identify gaps in teaching and learning. However, with that in mind it is said that engagement in a process defined as 'nuance' can have several downfalls to it, even for teachers with mass amounts of experience (Chokshi, 2004). For individuals who have minimal pedagogy experience there is a risk that they may be developing 'incidental knowledge' as a result of not knowing what to focus their attention to, whereas its intention is to enhance practice by learning from experienced others (Chokshi, 2004: 523) A common concern amongst researchers is the implication of time allocation due to the demanding commitments of a teacher (Chassels, C. and Melville, W., 2009). It is suggested that an effective lesson study is one that has been well prepared, and this planning can consume large amounts of time that teachers may not necessarily have. Like mentioned previously, the drive of this research method is to collaboratively analyse and reflect on an aspect, however this process again requires significant time provision that teachers may not have the scope for. On the contrary, time allocation for teachers appears to cause controversy amongst researchers as it is argued that

schools do allocate periods for educators to plan, professionally develop and collaborate within actual school hours (Groves, S., Doig, B., Vale, C, 2016). From our findings we can gather that although teachers may be equipped with time to undergo activities like a lesson study, research tells us that an effective study stems from thorough planning and preparation (Dudley, 2014). As a result of teachers completing several duties and responsibilities practitioners may not conduct detailed preparation and planning that research illuminates as vital in a study.

To conclude our exploration into lesson study, its purpose and impact we can recognise that there are benefits and issues. Whilst some researches worry that although lesson study has enhanced knowledge about how students learn, the theories behind the actual teaching are however uncertain (Elliot, 2012). On the other hand, there are mass amounts of educational experts who deem this method to be valuable in creating a well-researched and collaborative educational system. Furthermore, a system that actively seeks ways in which to improve through research is the aspiration for the teaching profession in Wales and it is articulated that teachers need to develop their pedagogical research capacity in the best interest of their learners (Furlong, 2016). Despite this, others articulate that studying lessons may seem like a natural thing to teachers, who are so familiar with the classroom setting. However, this naturallike process may result in those finding difficulty in recognising crucial aspects of the lesson (Fujii, 2014). Although there seems to be controversy surrounding the idea of lesson study, it is identified as a process that requires careful consideration to ensure all steps are conducted accurately (Dudley, 2003).

Lesson Study's Practicality

Lesson study is a form of research that requires several practical processes. The suggested cycle begins with practitioners consulting, reading and studying a specific aspect that require attention (Takahashi and Yoshida, 2004). During this process teachers come together and identify key aspects that should be the focus for the lesson study. In terms of our hypothetical research activity, this would consist of collaborating with a colleague in identifying current pupil engagement with AFL. During this initial process it would be effective to carry out relevant reading of literature to inform ideas surrounding the specific topic. For example, according to research learner engagement is increased when pupils are given more responsibility over assessment (Black, P, 2001). However, theorists have proclaimed that pupil involvement in aspects like AFL should include more specialised training to ensure that feedback is meaningful, understood and useful in terms of making further progress (Sebba, J., Crick, R.D.,

Yu, G., Lawson, H., Harlen, W. and Durant, K., 2008). Moreover, it is announced that a 'no hands up' strategy should be implemented in an environment where children feel eased and confident to be selected at random and this is to ensure their wellbeing is considered (William, D. 2015). Practitioners should utilise theories like this during the initial step to ensure that they have a full understanding of not just 'what' it is that they are doing but the 'why' and 'how' behind it as well. With theories like these in mind, they would inform decisions when planning the investigated lesson. For example, we can anticipate that learners may have an increased sense of engagement during AFL because of the no hands up strategy, this is due to them receiving a heightened sense of accountability as to whether they would like to answer or not. This preparation is crucial in immersing 'the teachers in the concept before they begin the planning process' (Hart and Carriere, 2011: 30).

As practitioners begin the planning of their lesson study, they must consider tools that can be utilised to ensure the right information is gathered. A process teachers can undertake is the creation of an observation sheet that can be used to record any aspects of the lesson. A useful tool is a colleague observation form that includes narrative notes for each subheading. This ensures that those observing have clear indications of specific episodes of focus (Wylie, C. and Lyon, C., 2013). In terms of the research question for this paper, our observation form will have five rows that narrate the focus for that observation, please see Appendices 1. The observation sheet is simple but easy for observers to utilise during the restricted time allocated, meaning that the observer can note any important information straight away rather than wasting time trying to figure out the functions of the sheet. Additionally, the observer should make prior professional judgement about the thoroughness of notes in line with time allocations. Whilst we understand that observations allow educators to create a written picture of incidents (Erlandson, Harris, Skipper & Allen, 1993) they must, however, ensure that recordings avoid personal interpretation but rather describe the incident exactly how it is (DeMunck & Sobo, 1998).

Given that our research focus is on AFL and pupil engagement, there must be preparation in place for the educators to conduct purposeful instruction, so pupils are aware expectations during feedback. This activity is intended to be carried out through whole class feedback, for example the teacher would conduct a series of questions to which the pupils would be expected to respond using a 'no-hands up' strategy. Due to this being a 'whole group' activity, it is suggested that direct instruction from the teacher is most effective as the practitioner has control over pupil focus and can maximise available time in the lesson (Hunt, G.H., Wiseman,

D.G. and Touzel, T.J., 2009). In addition, it would be beneficial if this instruction was visual to learners, perhaps presented clearly on a PowerPoint presentation. Visual instruction would be considered here because it is suggested that expectations and rules become more memorable for learners when visually seen during lessons (Rokni, S.J.A. and Karimi, N., 2013). Due to the purpose of this research activity it would be helpful to both pupils and teachers if the classes are reminded not to put their hands up during feedback, so a visual representation of this rule seems appropriate to use.

Another significant method educators can use during a lesson study is focus groups. The gathering of pupil voice during this activity is beneficial as they are the individuals most impacted by decisions. It was reported in a case study that a heightened sense of motivation and productivity occurred amongst classes when teachers had consulted with and then utilised pupils' ideas in lessons (McIntyre, D., Pedder*, D. and Rudduck, J., 2005). Likewise, focus groups offers practitioners a more in-depth understanding of pupil's views towards the specific focus and for the purpose of a research activity, educators can control what questions are asked in order to attain the most useful information. For example, using closed questions elicit either yes or no answers, constricting practitioners to be able to gather pupils' opinions or ideas (DeMarrais, K., 2004). On the other hand, open questions result in the participants having larger freedom in choosing what and how much they say and allows the interviewee to gain a sense of personal thought (Litosseliti, L., 2003). Before we consider the types of questions to use during this process we must identify exactly what it is we want to know from pupils. The purpose of this activity is to explore pupil engagement during a no hands-up approach when participating in AFL, so it is crucial to gather opinions on shouting out answers in relation to hands-up. Moreover, we would want to attain any ideas on Questions (Q's) and Answers (A's) in the classroom, do they think it is useful in terms of progress to listen to the different answers shouted out by their peers? To attain pupils' views on a 'no hands up' strategy, the following questions seem appropriate to use:

1. How do you feel about your teacher instructing the class to shout out answers?
2. How do you feel about your teacher instructing the class to raise hands when answering questions?
3. If you could improve anything about how your teacher underwent Q's and A's, what would it be?
4. Is there anything else you think is important to add?

The choice of open questions asked through 'what' and 'how' helps illustrate the interviewee's opinions and thoughts as opposed to what the interviewer assumes. It is important to note that

Question 4: 'Is there anything else?' was included to again, offer the participants freedom and control over their responses. This choice of questioning is significant in gaining more a broadened perspective, as the learners may surprise us with ideas on an aspect that we may not have been aware of before (DeMarrais, K., 2004). Whilst we can understand the benefits of focus groups, this process is time-consuming in terms of ethical considerations that must be made when conducting research in schools (BERA, 2014). A fundamental aspect of ethical research is to gather informed consent; however, one must be mindful that pupils have the full right to remove themselves from the activity at any stage (BERA, 2018). Additionally, due to pupil participants being minors, consent from parents or guardians is required for focus groups to commence. An activity that must be considered is the creation of a consent document that can be sent to pupils' parents or guardians, please see Appendices 2. Also, part of this preparation would be to decide how data collected from participants will be managed and stored with confidentiality as this 'anonymous treatment of participants is considered the norm ... of research' (BERA, 2018: 21). From this it would be decided that information should be stored on the educator's personal devices where only the researches have access to.

Though a lot of consideration and preparation must be in place prior to the focus group, its effectiveness in generating pupil voice to improve teaching standards is certainly worthwhile. Donaldson (2015) also shares his sentiment that it is significant to use learner voice in decision making. Moreover, it is stated that pupils want more responsibility in the classroom and when given, it can increase energy and positive attitudes amongst them (McIntyre, D., Pedder*, D. and Rudduck, J., 2005). However to ensure you are gathering information effectively, Dudley recommends the following aspects (2014) when undergoing focus groups with learners: concentrate to record their exact words, conduct the interview relatively soon to ensure good memory is apparent and ensure the process short to avoid losing engagement. Another implication to focus groups circulates around the Hawthorne effect, meaning that interviewees can shape their responses due to their rapport with the educator (McCambridge, Jim, John Witton, and Diana R. Elbourne, 2014) and this can cause potential risk to the accuracy of information gathered.

The final element of lesson study is the reflection process that typically occurs at the end of the activity (Dudley, 2014). Although common lesson studies involve a process that returns to the classroom to revise any aspects that were discussed during the first study, this paper focuses on a hypothetical approach so any areas that may need revisiting during a second lesson study will be mentioned during this reflective section of the paper. With that in mind, lesson study experts declare that the re-teaching of the research study is an optional process

but not compulsory in carrying out a successful lesson study (Lewis et al. 2009). It is articulated that reflection is a crucial element during a lesson study as it develops practical thinking and that a sense of 'new eyes' is given to us as a result of obtaining a 'qualitatively different perception' (Runesson, 2015: 191). To discuss the outcome of the lesson study we will be using Gibb's reflection model that involves six processes: 1. Describe the focus, 2. What are our feelings towards it? 3. Evaluate the strengths and implications, 4. Analyse the situation, 5. Conclude with further actions that could have been used, and lastly 6. Create an action plan in terms of next steps in practice (Gibbs, 1998). Typically, the teacher and observer would work together during this process to ensure effective collaboration is occurring (Dudley, 2011). The initial step would include the description, that being the impact a 'no hands up' strategy had on pupil engagement during AFL, this could be a discussion on the noise level during feedback.

Meanwhile, the sharing of feelings towards the lesson would be the following process and often researchers would use information attained during prior preparation here (Chokshi, S. and Fernandez, C., 2004). For example, as mentioned before we anticipated that learners will become more motivated due to having a heightened responsibility, so upon reflection, researchers could compare prior assumptions to the real situation. The third step of evaluation would involve discussion on what the observed teacher believed the strengths and issues to be (Gibbs, 1998). Ultimately, this creates an opportunity to broaden perspective as they would then invite their research partner to share their thoughts on the challenges and benefits that arose during the lesson. This part of the reflection process ensures that practitioners are developing their collaboration trait, a skill that the Welsh Government aspires for the teaching profession to possess (Welsh Government, 2017). In their article outlining the pedagogy standard for collaboration they state that good teachers are those who seek opportunities to work together with partners, in the hope of improving teaching and learning (Welsh Government, 2017). In terms of collaboration during reflection, Dudley announces (2014) that we can only ever effectively reflect when we are openminded and amongst a lead figure who can control discussions in a positive but professional manner.

The next step of our Gibb's influenced reflection is the analysis of the situation, here research partners would discuss any elements that may have affected the outcome. For example, a potential risk could be the noise level during feedback becoming considerably high, resulting in learners mishearing answers and losing engagement. This is a prime example of the types of discussions that can occur during the Analysis process of Gibb's (1998) reflective cycle. Subsequently then, we would explore our conclusions of findings, that being what was learnt

from the experience and more importantly, utilising research to come up with ideas on how to progress practice further. Lastly, the sixth and final process would involve research partners working together and creating an action plan in terms of next steps in their teaching, typically practitioners would use findings obtained from research and data both internally and externally to the school to inform future pedagogic decisions (Dudley, 2014). An example of this decision making could perhaps be how educators can control noise levels during feedback that has a 'no-hands up' strategy in future lessons. This decision could be considered as a result of participants commenting that they misheard answers during feedback, resulting in educators utilising pupil voice and then conferring with colleagues or research to explore methods to minimise this potential risk in the future. Here practitioners could explore ways to ensure a 'no hands up' strategy is conducted correctly, that meaning that learners are given clear expectations that the teacher will select students to respond at random to ensure the environment is calm and controlled (Wiliam, D. 2015). These ideas would then be placed into an action plan that can be used in future lessons. Ultimately, by using a model like Gibb's cycle means that reflection is conducted collaboratively and results in a thorough and detailed self-evaluative process.

From this activity we can gather that lesson study illuminates several fascinating viewpoints. However, it is interesting to note that Chokshi discusses the benefits and implications of this activity but brings to light that there is a great deal of ideas that are built upon assumption and that all pedagogy statements should be supported by evidence-based framework, rather than opinions (Chokshi, 2004). From this, a large amount of research used in this paper stems from practical case studies performed by participants across the world. Ultimately, research presents to us a contrast in views regarding lesson study. Whilst some state there needs to be a more in-depth preparation process to ensure all participants have clarification about important aspects, there is however a larger bank of sources that announce lesson study to be a tremendously powerful tool in improving teaching. The most significant finding from this research activity were the benefits that stem from this method being conducted collaboratively, highlighting the positive impact different perspectives has on one's CPD. Whilst, Dudley proclaims that lesson study is the way forward in ensuring that education settings are selfimproving on the basis of research, he also shares his notion that this method can only be conducted if all participants share the same agenda throughout all stages (Dudley, 2014). Ultimately, we understand why so many educators are using lesson study, it encourages collaboration and reflection and enables teachers to have ownership of their CPD. More importantly, its processes use pupil perspective to advance the quality of teaching and subsequently, results in teaching decisions being made based on evidence. However, to be

conducted correctly, as Dudley advises (2014) all participants must be open minded and willing to work together.

Appendix:

Appendices 1: Observation Sheet

Name of Participants: Name of Class:	Date:
Learning objective for the lesson:	Number of pupils present: Number of pupils observed:
AFL Question 1: (Explain context)	Pupil Engagement:
AFL Question 2: (Explain context)	Pupil Engagement:
AFL Question 3: (Explain context)	Pupil Engagement:

Appendices 2: Parental and Participant Consent Form



Y Ddrindod Dewi Sant

University of Wales

Trinity Saint David

Consent Form

I give permission for the pupil, _____ to participate in a research project that is exploring how pupil engagement is affected by a 'no hands up' strategy during whole class feedback.

By signing this form, I give my informed consent for my child to participate in the following:

- To be observed during two hourly lessons, specifically during whole class feedback.
- To participate in a focus group, where questions about the topic's focus will be asked.

Name of Parent/Guardian _____

Signature of Parent/Guardian _____

Date _____

Name of Participant _____

Signature of Participant: _____

Date _____

This consent will be on file throughout the time that the research will be conducted. You may revoke this consent at any time. The interview will only be conducted if the researchers have consent from both parent and student.

Many thanks,

Reference List:

- Archer, R. "Lesson study in initial teacher education: Students' positioning analysed through the lens of figured worlds." *British Society for Research into Learning Mathematics* (2016).
- Barth, R.S., 1990. *Improving schools from within: Teachers, parents, and principals can make the difference*. Jossey-Bass Inc., Publishers, 350 Sansome Street, San Francisco, CA 941041310.
- Black, P. 2001. Self-and peer-assessment and taking responsibility: The science student's role in formative assessment. *School Science Review*, 82, pp.43-50.
- Boonsena, N., Inprasitha, M. and Sudjamnong, A., 2019. Pre-Service Teachers as a Part of Lesson Study Team. *Creative Education*, 10(6), pp.1259-1270.
- British Educational Research Association, 2014. Research and the teaching profession: Building the capacity for a self-improving education system. Final Report of the BERA-RSA Inquiry into the Role of Research in Teacher Education. *London: BERA*.
- Chassels, C. and Melville, W., 2009. Collaborative, Reflective, and Iterative Japanese Lesson Study in an Initial Teacher Education Program: Benefits and Challenges. *Canadian Journal of Education*, 32(4), pp.734-763.
- Chokshi, S and Fernandez, C, 2004. Challenges to importing Japanese lesson study: Concerns, misconceptions, and nuances. *Phi Delta Kappan*, 85(7), pp.520-525.
- Cochran-Smith, M. and Lytle, S.L., 2001. Beyond certainty: Taking an inquiry stance. *Teachers caught in the action: Professional development that matters*, pp.45-58.
- DeMarrais, K., 2004. Qualitative interview studies: Learning through experience. *Foundations for research: Methods of inquiry in education and the social sciences*, 1(1), pp.51-68.
- De Munck, V.C. and Sobo, E.J. eds., 1998. *Using methods in the field: a practical introduction and casebook*. Rowman Altamira.
- Donaldson, G., (2015). Successful futures: independent review of curriculum and assessment arrangements in Wales: February 2015.
- Dudley, P., 2011. Lesson Study: what it is, how and why it works and who is using it.
- Dudley, P. ed., 2014. *Lesson study: Professional learning for our time*. Routledge.
- Dudley, P., 2003. Lesson study: A handbook.
- Elliott, J., 2012. Developing a science of teaching through lesson study. *International Journal for Lesson and Learning Studies*.
- Erlandson, D.A., Harris, E.L., Skipper, B.L. and Allen, S.D., 1993. *Doing naturalistic inquiry: A guide to methods*. Sage.
- Fujii, T., 2014. Implementing Japanese Lesson Study in Foreign Countries: Misconceptions Revealed. *Mathematics Teacher Education and Development*, 16(1), p.n1.
- Furlong, J., 2016. Initial Teacher Education in Wales—a Rationale for Reform. *Cylchgrawn Addysg Cymru/Wales Journal of Education*, 18(1), pp.45-63.
- Gibbs, G., 1998. Learning by doing; a guide to learning and learning methods.
- Groves, S., Doig, B., Vale, C. 2016. Critical factors in the adaptation and implementation of Japanese lesson study in the Australian context. *ZDM*, 48(4), pp.501-512.

- Gutierrez, S.B., 2015. Collaborative professional learning through lesson study: Identifying the challenges of inquiry-based teaching. *Issues in Educational Research*, 25(2), p.118
- Hargreaves, D.H., 2012. A self-improving school system: towards maturity.
- Hart, L.C. and Carriere, J., 2011. Developing the habits of mind for a successful lesson study community. In *Lesson study research and practice in mathematics education* (pp. 27-38). Springer, Dordrecht.
- Huang, R. and Shimizu, Y., 2016. Improving teaching, developing teachers and teacher educators, and linking theory and practice through lesson study in mathematics: an international perspective. *ZDM*, 48(4), pp.393-409.
- Hunt, G.H., Wiseman, D.G. and Touzel, T.J., 2009. *Effective teaching: preparation and implementation*. Charles C Thomas Publisher.
- Inagaki, T. and Sato, M. 1996. *Jugyo Kenkyu Nyuumon [Introduction to lesson study]*, Tokyo: Iwanami Shoten.
- Kawulich, B.B., 2005, May. Participant observation as a data collection method. In *Forum qualitative sozialforschung/forum: Qualitative social research* (Vol. 6, No. 2).
- Larssen, D.L.S., Cajkler, W., Mosvold, R., Bjuland, R. 2018. A literature review of lesson study in initial teacher education. *International Journal for Lesson and Learning Studies*.
- Lewis, C., Perry, R. and Friedkin, S., 2009. Lesson study as action research. *The SAGE handbook of educational action research*, pp.142-154.
- Lewis, C., Perry, R.R. and Hurd, J., 2009. Improving mathematics instruction through lesson study: A theoretical model and North American case. *Journal of mathematics teacher education*, 12(4), pp.285-304.
- Litosseliti, L., 2003. *Using focus groups in research*. A&C Black.
- McCambridge, Jim, John Witton, and Diana R. Elbourne. "Systematic review of the Hawthorne effect: new concepts are needed to study research participation effects." *Journal of clinical epidemiology* 67, no. 3 (2014): 267-277.
- McIntyre, D., Pedder*, D. and Rudduck, J., 2005. Pupil voice: comfortable and uncomfortable learnings for teachers. *Research papers in education*, 20(2), pp.149-168.
- Moyles, J., 2002. Observation as a research tool. *Research methods in educational leadership and management*, pp.172-195.
- Oecd, A., 2014. Improving Schools in Wales.
- Rokni, S.J.A. and Karimi, N., 2013. Visual instruction: An advantage or a disadvantage? What about its effect on EFL learners' vocabulary learning. *Asian Journal of Social Sciences and Humanities*, 2(4), pp.236-243.
- Saito, E., 2012. Key issues of lesson study in Japan and the United States: A literature review. *Professional development in education*, 38(5), pp.777-789.
- Sebba, J., Crick, R.D., Yu, G., Lawson, H., Harlen, W. and Durant, K., 2008. Systematic review of research evidence of the impact on students in secondary schools of self and peer assessment.
- Wales Online, 2019. New international Pisa schools tables show Wales remains behind other UK nations but is improving. <https://www.walesonline.co.uk/news/education/pisa-walesinternational-schools-2019-17346247> (Accessed on 07.07.2020).

Welsh Government, 2017. Professional Standards for Teaching and Leadership.

Wheater, R., Ager, R., Burge, B. and Sizmur, J., 2013. *Achievement of 15-year-olds in Wales: PISA 2012 National Report: OECD Programme for International Student Assessment*. National Foundation for Educational Research (NFER).

William, D., 2015. Practical ideas for classroom formative assessment. *Dylan William Center blog*.

Willems, I. and Van den Bossche, P., 2019. Lesson Study effectiveness for teachers' professional learning: a best evidence synthesis. *International Journal for Lesson and Learning Studies*.

Wylie, C. and Lyon, C., 2013. Using the formative assessment rubrics, reflection and observation tools to support professional reflection on practice. *Educational Testing Service*.