AUTHOR:
Mrs Erika Helmbold[1]
Dr Roy Venketsamy[1]
Dr Judy van Heerden[1]

AFFILIATION:
[1]University of Pretoria, South Africa

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IMPLEMENTING LESSON STUDY AS A PROFESSIONAL DEVELOPMENT APPROACH FOR EARLY GRADE TEACHERS: A SOUTH AFRICAN CASE STUDY

ABSTRACT

Lesson Study is an internationally recognised professional development approach for teachers. This case study explores the impact of implementing Lesson Study in the early grades of a South African primary school, pertinently targeting early childhood mathematics teachers. The evidence suggests that Lesson Study has the potential to positively influence content knowledge, pedagogical content knowledge, general professional development and creative teaching of early grade teachers. The study established that Lesson Study enhanced intergrade cooperation and curriculum development and flow. Participants regarded the collaborative experience as deeply enriching and fulfilling. Although some implementation challenges were encountered, these were not insurmountable and the overall benefits of Lesson Study outweighed the potential obstacles.

Keywords: *Collaboration; early grades; Lesson Study; mathematics; professional development; professional learning community.*

1. INTRODUCTION

As is commonly accepted, a link exists between competent teaching and effective learning, paving the way for learner achievement (see Kane, Taylor, Tyler & Wooten, 2011; Stronge, Ward & Grant, 2011). Teachers should continually grow their knowledge and skills in order to be more effective when it comes to implementing the best educational practices possible (Mizell, 2010). Professional development (PD) of teachers is a necessary process for promoting the growth of teacher knowledge and excellence, enabling teachers to put knowledge into practice for the benefit of their learners (Avalos, 2011). Teachers in South Africa have been criticised for their lack of content knowledge (Feza, 2016; Musundire, 2017; Venkat & Spaull, 2015) and poor overall professionalism (Msibi & Mchunu, 2013). In mathematics, learners are lagging behind their peers in

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international benchmarking (Reddy *et al.,* 2016). There is an urgent call to develop our current teachers to bridge this gap, to enhance their competence to improve learner performance. Effective teacher PD "continues to be the most important challenge where the improvement of South African schooling is concerned" (De Clercq & Phiri, 2013:77). This paper explores the impact of implementing Lesson Study as a PD approach in the early grades of a South African primary school, targeting early childhood mathematics teachers.

Extant research literature elucidates several components of successful teacher PD, including the approach of in-service co-learning through a system of professional learning communities (PLCs) (Feldman, 2020). "Some of the most promising approaches to the professional development of teachers have been those that seek to target teachers within the multiple contexts of their schools and classrooms" (Jita & Mokhele, 2012:2). This form of in-service PD should be initiated and supported by school leadership for a more successful and sustainable outcome (Brown & Militello, 2016). Interested stakeholders in the South African education arena have endorsed such in-service models of PD in their Integrated Strategic Planning Framework for Teacher Education and Development in South Africa 2011–2025 (ISPFTED) (DBE, 2011). The aim has been to include these PLCs within all schools to promote teacher PD. Evidence suggests that school-embedded collaborative PD is more effective in teacher PD than non-school based PD courses and workshops (Opfer, 2016; Mukeredzi, 2013). However, these professional learning communities have been slow to materialise locally and "have yet to take off across a wide range of schools" (DBE 2015:35).

Effective PD programmes should incorporate a strong focus on learner outcomes (Cordingley *et al.,* 2015) and be of a prolonged duration (Darling-Hammond & Richardson, 2009; DeMonte, 2013; Taylor, 2008) with a cyclic "rhythm" of monitoring, support and follow-up activities (Darling-Hammond, Hyler & Gardner, 2017). Furthermore, effective professional teacher development should centre on the improvement of teacher-pedagogical and subject knowledge (Cordingley *et al.,* 2015).

This article summarises key findings of a study exploring the impact of implementing an internationally well-established PLC method (Dudley, 2014), namely the Japanese Lesson Study, as a potential framework for facilitating the PD of early childhood mathematics teachers in a South African primary school. The Lesson Study approach fulfils the criteria of school-embedded PD and recommends components for effective PD, as discussed above. With a growing body of international evidence promoting Lesson Study as a powerful and flexible method of teacher development (Cajkler *et al.,* 2014; Dudley, 2013; Lewis *et al.,* 2012; Hunter & Back, 2011), it is concerning that South Africa lags behind when it comes to implementing, analysing and documenting the potential of this PD approach. Particularly conspicuous in its absence is any recorded research on the impact of Lesson Study as a PD tool for early grade South African teachers as well as research on the potential challenges in implementing such a PLC, which is the lacuna addressed by this article.

2. WHAT IS LESSON STUDY?

Lesson Study consists of certain common and basic components, namely a teaching group formulating goals to address the needs in learner learning and development; group formulation of a lesson plan to attain the goals; presentation of the lesson by one member of the group, while the others observe and gather evidence; and discussion of and reflection on the evidence gathered during the lesson by the group, while using these to improve the lesson

and their own teaching practice (Groves *et al.,* 2013). These PLC sessions devote large portions of time discussing the flow of the lesson and anticipated learner responses (Fujii, 2016). Seleznyov (2018) describes how authentic Lesson Study incorporates the cyclic nature of gleaning knowledge from post lesson discussions to guide new lesson plans. Seleznyov (2018) further expounds the way in which authentic Lesson Study promotes the spread of knowledge amongst teachers and across schools by means of a feedback process. One way in which to achieve this is to invite teachers not directly involved in Lesson Study planning to observe and discuss the research lesson (Takahashi & McDougal, 2016: 521).

Participants engage in Lesson Study for the purpose of learning something new, and not for refining a lesson (Takahashi & McDougal, 2016). In its original state, Lesson Study is neither "funded nor mandatory" as a form of teacher development (Doig & Groves, 2011:77). Traditional Lesson Study is celebrated as a highly collaborative model, developing a "community of teachers who learn together" (Stols & Ono, 2016:1).

3. METHODOLOGY

This study employed a case study approach, entailing the examination of a phenomenon as an isolated instance occurring within its own context.

The research was conducted in a single independent, non-subsidised primary school situated in urban Gauteng, South Africa, within the Ekurhuleni North region. The community served by the school borders an urban township in the outer city suburbs. The community could be defined as having a middle socio-economic status. The school learners had a demographic distribution similar to that of the general population of South Africa: 74% African, 12% Indian, 9% White, 4% Coloured and 1% Asian. The school had 420 learners at the time of research, of which 256 were early grade learners, that is, Grades RRR–3. Ethics approval was obtained from the Committee of the University of Pretoria and Gauteng Department of Education: Research Unit prior to research commencing.

The Lesson Study sessions were held once weekly, usually for two hours, over a 14 week-period. Two research lessons were presented during the 14-week period of data gathering. These lessons were undertaken while non-participating teachers and learners attended a school assembly, ensuring minimal disruption to the daily school timetable. Research lessons were presented to Grade 1 learners.

Initially, 11 teachers from the school were invited to participate in the research. Of the 11 that were initially invited, only six agreed to participate. Participants signed informed voluntary consent for their participation. The table below summarises the relevant demographics of the participating teachers. Teachers were coded to ensure anonymity and confidentiality.

Table 1: Demographics of research participants

Teaching grade of participant	Age	Years of teaching experience at time of research	Race	Qualification	Code given
Grade R	39	19	White	BA Ed	T1
Grade R	48	23	White	HDE	T2
Grade 1	24	1	White	BEd	T3
Grade 1	68	46	White	THDE & FDE	T4
Grade 2	41	14	White	BA Hons PGCE	T5

Teaching grade of participant	Age	Years of teaching experience at time of research	Race	Qualification	Code given
Grade 2	65	17	White	BA & HED	T6
Researcher/ facilitator	42	23	White	MEd	T7

Data collection methods included a semi-structured focus group interview at the onset of the study, live recordings of all meetings that were transcribed and accompanied by intensive field notes, weekly participant journaling and two research questionnaires, one occurring mid-study and one at its conclusion. Table 2 below reflects the data collection process outlining the timeline of the research and data collection methods utilised at each stage.

Table 2: Timeline of data collection process

	Time	Data collected by researcher (observations and field notes, memos, audio recordings and researcher reflective journaling)	Data submitted by participants
Cycle 1	Week 1	Introductory training on the Lesson Study method and a semi-structured focus group interview	
	Week 2	Pre-lesson discussion	Reflective journaling
	Week 3	Pre-lesson discussion	Reflective journaling
	Week 4	Pre-lesson discussion	Reflective journaling
	Week 5	Pre-lesson discussion	Reflective journaling
	Week 6	Lesson delivery and post-lesson discussion	Reflective journaling
Cycle 2	Week 7	Pre-lesson discussion	Reflective journaling
	Week 8	Pre-lesson discussion	Reflective journaling
	Week 9	Questionnaire	Questionnaire
COVID-19 COMPULSORY GOVERNMENT SCHOOL LOCKDOWN			
Cycle 3	Week 10	Pre-lesson discussion	Reflective journaling
	Week 11	Pre-lesson discussion	Reflective journaling
	Week 12	Pre-lesson discussion	Reflective journaling
	Week 13	Lesson delivery and post-lesson discussion incorporating outside teachers	Reflective journaling
	Week 14	Questionnaire	Questionnaire

Data were analysed thematically. Practical steps taken in the analysis involved gaining familiarity with the data through managing and organising the materials, while transcribing and reading, followed by the generation of initial codes. Themes were uncovered and defined from coding which required a combination of inductive and deductive processing skills. Initially, a limit of 50 initial codes was utilised that were later combined and reduced into a smaller number of broader categories. The coding process combined *a priori* coding and open coding (Maree, 2007). The open coding primarily used inductive analysis of the data, allowing codes that were not prefigured to emerge. However, due to an extensive literature review and the construction of a predetermined conceptual framework underpinning the study, certain *a priori* codes were also utilised.

Definitive attempts were made to safeguard the credibility, transferability, dependability and confirmability of the data (Lincoln & Guba, 1985). The research project was relatively prolonged, allowing for the building of trust between the participants. Multiple contextual theories and data sources were utilised, including journals, field notes, transcriptions of meetings, questionnaire feedback and group interview transcriptions, allowing for intense triangulation and crystallisation of the data. Transferability of the research was enhanced through vivid and rich descriptions of the process, incorporating extensive detail and clearly bounding the research criteria. Dependability was maintained through the creation of an audit trail and through a process of peer auditing. Peer auditing occurred on a weekly basis with a non-participating colleague. Participants member-checked all final research findings.

4. FINDINGS AND DISCUSSION

Lesson Study had a significant impact on several areas of the professional development of participant teachers. Impact was primarily noted around improving content knowledge and pedagogical content knowledge of participants, as well as general areas such as raising the standard at which lessons were presented, promoting the utilisation of diverse teaching resources, creative thinking, self-study and improved self-confidence. Participants however noted both positive and negative affective and physical impacts of the study. Improved intergrade cooperation and curriculum development and flow were evident. Furthermore, the study significantly improved professional collaboration.

4.1 Impact on content knowledge and pedagogical content knowledge

Lesson Study enhanced the content knowledge as well as the pedagogical content knowledge among participants. At the onset, teachers expressed high levels of confidence in their own conceptual understanding. However, as the study progressed, a number of deficits in their content knowledge were uncovered, ranging from insufficient grasp of the CAPS syllabus to a lack of knowledge about mathematical definitions and methods. Participating in this study had the dual benefit of creating personal awareness of these content knowledge shortcomings among some participants and a means of improving these. In response to a questionnaire, T6 said: "*I think my Maths content knowledge improved because I saw different aspects of certain operations that I didn't think of before".* T5 wrote:

> My knowledge of patterning, subtraction methods and multiplication methods has increased exponentially (and it's not only head knowledge – the use of practical problem solving ways to approach the topic made me internalise this knowledge and I believe it will be readily available for me to draw on when I teach these areas).

Through Lesson Study discussions, participants naturally re-examined their beliefs in three particular schools of thought, namely the genetic predisposition of mathematical ability in learners developed through incidental teaching, the need for method-based teaching and the effects of teaching with a problem-solving approach. Participants acknowledged that, through their involvement in this Lesson Study, problem-solving became a more attractive and preferential didactic approach. T4 stated: *"I am now at the stage where I want to try problem solving approaches in maths."* This was confirmed by all participants at various stages during the research, as reflected in the following responses: "*I moved away from only focussing on method teaching and want to try incorporate some problem solving lessons into my planning"* (T5) and *"The fact that I realised that we need to focus more on problem solving and allowing the children to try to solve a problem in their own unique ways, was a wake-up call…"* (T6).

The study impacted the way in which some, but not all, of the participating teachers viewed their dependence on worksheets when it came to lesson planning and teaching. The outcome was a greater aversion to worksheet-based teaching and an awareness of alternative didactic approaches. T5 concluded: *"[After Lesson Study] I now want to use less worksheets. By doing more problem solving lessons more learners will be reached,"* T6 stated: *"Worksheets and workbooks cannot replace teaching. That became more evident to me during the Lesson Study process".*

Teachers engaged in discussions incorporating movement in lessons as well as unique grouping for learners. Some teachers commented in meetings that this also affected their lesson planning outside of the Lesson Study demonstration lessons.

4.2 General professional development

Journal entries showed that teachers revisited their need to provide clear instructions while teaching and indicated heightening of their awareness of using mathematical language correctly. T4 wrote in her journal: *"I have learnt that it is very important to be precise, brief, clear etc.",* and T2 concurred *"This led me to another question I ask myself: does the success of the learner depend on their ability or the clarity of communication i.e. is this a Maths problem or language barrier?"*

It was noteworthy that the Lesson Study sessions impacted the level at which demonstration lessons were pitched, provoking higher-level thinking and problem solving skills and creating lessons that were quite challenging for the learners. The high standard of lessons was noted by visiting teachers in post-lesson discussions. One such teacher commented in her feedback, *"I know you spoke about some of the things that you thought was too difficult, but I thought it was interesting that you also introduced that to them... You challenged the stronger [learners]"*. A visiting expert on Lesson Study from the University of Pretoria commented in a post-lesson discussion that the *"lesson was pitched at the very high level".*

The desire to teach at a higher standard was not only noticeable during the presentation lessons but was an outflow of the Lesson Study process as a whole. This impacted the level of thinking and lesson preparation of some participants outside of the Lesson Study context. There was evidence of this in the journaled self-reflections of participants, where a potential evidential link between Lesson Study and general improved teaching in the classroom emerged. Teachers recorded in their journals and questionnaires how Lesson Study provoked them to explore "*other ways of teaching"* (T1 and T5), and to *"take a deeper look into the way I teach"* (T3), which resulted in broader experimentation with resources and alternative didactic approaches.

Teachers were impacted in their implementation and demonstration of creativity and the potential of using diverse teaching resources. T5 journaled: "*I was amazed at how many ideas came up and that we had a hard time selecting what we could do!"* The stimulation of creative thought and sharing of creative ideas was noted as a highly enjoyable aspect of the process.

There was a general provocation towards self-study, evidenced by participants researching on the internet to be prepared for the Lesson Study sessions. In Lesson Study meetings, teachers claimed to have sourced *"YouTube videos"* (T5), *"Google"* (T3), other online videos and *"Pinterest"* (T6) to improve preparation for sessions. Teachers also recorded that they continued to think of mathematical concepts and teaching in general outside of the PD sessions, as presented in the following journal excerpts: *"I do think more about the ways I*

teach maths in non-Lesson Study times and try new things more with regards to teaching maths in my class" (T3) and *"I found once again that by questioning myself with regards to how I teach, I can focus more on the children's understanding of the work rather than just flying through the syllabus and 'training' them to pass tests"* (T6).

Lesson Study improved the self-confidence of participants. Confidence levels were enhanced through teacher participation in collaborative discussions and demonstration lessons, including observation of the latter. This was a reciprocal process. Participants felt affirmed by contributing and, in return, felt motivated to contribute further and attempt to implement new learning in classroom practices. T2 expressed it as follows: *"I have more confidence in my ability to contribute to learner and teacher development… I faced my fears and pushed through".*

Participation in the study inspired discussions on the type, size, colour and use of a large variety of resources. Teachers felt challenged to think of novel, recyclable and attractive resources that would best serve the purpose of teaching mathematical concepts. In the first cycle, they used discarded egg trays and pre-cut circular counters. They also used magnetised pictures, numbered discs of different colours and laminated number charts. For the second lesson, they planned to use large scale dice, a large scale box of crayons and number cards with hidden flaps (note: the presentation of this lesson was interrupted by COVID-19-related closures of schools). The third lesson utilised socks, buttons, coloured shapes and "folded mystery boxes" containing sweets. A large portion of each cycle was dedicated to the discussion of these resources and their practicality.

Participants had opportunities to observe learners and the learner thinking processes. Teachers described this process as rewarding, surprising and occasionally disappointing. Observing other teachers presenting lessons also prompted participants to evaluate different teaching practices. Teachers were motivated to implement practices they found appropriate in their own classroom settings.

4.3 Affective and physical impact

This study often left participants physically drained. Teachers were not always positive during the study and occasionally expressed emotions such as boredom, disillusionment, fear and frustration. Particular stressors identified were differences in didactic beliefs among different grade participants, physical exhaustion, fear of participation (feelings of inadequacy), fear of presenting and clashes around expected lesson goals.

Although these negative affective triggers and responses were noted, the data recorded mostly positive emotions such as enthusiasm, curiosity and enjoyment. Participants found that, overall, the study motivated their mathematics teaching. T3 expressed it as follows:

> Before we started the research I was not specifically very motivated in teaching maths as I didn't have a clear idea or guideline as to what I was doing. Since doing the research where we have unpacked specifically the Grade 1 syllabus and certain concepts and done more research, I feel more motivated to teach mathematics. I am more motivated to search and experiment and read up about concepts and mathematical content than before and I am enjoying it more.

All participants who began the study stayed up to completion and attributed their commitment to the enjoyment of personal growth, curiosity, the fun experienced through

collaboration, ownership of the product (the completed lesson) and the fulfilment of a personal desire to make a difference in the lives of other teachers.

4.4 Intergrade cooperation and curriculum development and flow

From the onset, it was apparent that teachers lacked sufficient knowledge about the content involved in mathematics in the grades preceding or succeeding their own. Many expressed comments in their journals about it. One such example was: "*how little one phase knows about what happens before or after their particular grade"* (T1). The data perpetually provided examples of knowledge gaps being bridged between grades and an improvement of intergrade awareness regarding curriculum flow. This intergrade bridging outcome of Lesson Study was noted and undoubtedly valued by the teachers. T1 also commented: *"I think that Lesson Study between phases has been very useful, seeing what comes before and after you, [this] has been the most beneficial part of this process for me".*

Initially, poor understanding regarding mathematics content covered for each grade resulted in feelings of disrespect and frustration. The Grade R teachers felt disrespected in their professional capacity, mostly because the Grade 1 teachers did not acknowledge the amount of work accomplished in Grade R. There was no evidence in the data to suggest that the higher-grade teachers were cognisant of, or agreed with, their perception. However, the study did evidence a general improvement of respect between all participants, as expressed by T3:

> Lesson Study has definitely created new feelings of respect for the teachers from the other grades in seeing what they teach and how they teach… Lesson Study has given me more feelings of respect knowing that they work just as hard or even harder to teach their content even from a young age such as Grade R even without worksheets.

In addition to creating an awareness of curriculum flow within a grade and across the early grades, there was a general awareness of curriculum shortfalls. The study created opportunities for teachers to thoroughly plan for topics as units of progressive understanding within a grade. The participants also divided curriculum content logically and in accordance with their school calendar across given dates.

4.5 Collaboration

This study harnessed the power of collaborative thinking among professionals. Before the study, participants acknowledged a pre-existing, unfulfilled need for collaboration. T3 lamented as follows: *"I feel we as teachers often like to keep things and lessons to ourselves or often don't have any new and fresh ideas for lessons and teaching".* The collaborative process created room for enjoyable and effective sharing, as recorded in T4's journal: *"I enjoy how the teachers are keen to share about how they teach a certain concept! Love it! That is how we learn".* T2 concurred: "*I enjoyed today's session, as a collaboration of ideas with everybody having something to contribute. I like getting new ideas to try and apply".*

4.6 Participants' subjective experiences

All participants felt that Lesson Study was more beneficial than previous professional development courses that they had attended. T2 wrote in her final questionnaire that she was impressed with the *"practical ideas and teacher input (unlike a 1-hour course lecture where you mostly switch off, when nothing is really required from you)".* T1 felt it benefited her by requiring "*far more interaction… not just sitting in a lecture that is so general..."* She also

mentioned the advantage of being "*far more personally invested in the input and outcome of this exercise".* Personal investment as a motivating factor was confirmed by other participants: "*because you are actively involved in the process and more emotionally drawn to it (because of the work you put into it), you internalise and remember what is discussed a lot more"* (T5). T3 noted that Lesson Study provided *"more practical work that I can use in my class".* This was confirmed by T5 who stated:

> It becomes part of your easily accessible knowledge and you don't have to recap it. You will be in a lesson and suddenly remember an idea or a way of doing something and hence implement it.

5. CHALLENGES EXPERIENCED IN THE STUDY

Several challenges were noted around implementation of Lesson Study. As the approach is unprecedented in the region, the participants did not have support from experienced professionals in the process. When problems presented themselves, contextually relevant solutions were sought. Although hurdles were noted, most were overcome, allowing for the benefits of the study to outweigh the challenges.

5.1 Conceptual understanding as a prerequisite for goal setting

One of the most difficult and unexpected problems faced by the participants was that of goal setting in the initial pre-lesson discussions. Without a solid conceptual base in the first Lesson Study cycle, the participants approached the cycle with conflicting personal goals.

In the traditional Japanese Lesson Study cycle, the collaborative teacher group establishes a research theme as the launching step of the process (Fujii, 2016; Seleznyov, 2018). Traditionally, teachers engage in studying the curriculum and determining topics learners are struggling to understand, establishing a learner-oriented goal for the demonstration lesson (Akiba, Murata, Howard & Wilkinson, 2019). A similar adaptation is proposed by the University of Pretoria and intimated as the Lesson Study model adopted by South Africa (Sekao, 2020). Sekao (2020) recommends that Lesson Study begins with diagnostic assessment through an analysis of learner results to determine shortcomings and areas requiring intervention. "This is where the Lesson Study has to start, where we identify a problematic concept in mathematics" (Sekao, 2020). Sekao explains further how this can be accomplished through analysing learner responses to common tests or examinations.

However, in early grades, such as those of this particular case study, formal testing and examinations are not readily available as diagnostic tools. Given that mathematical concept formation is embryonic in Grade R and Grade 1, it was not beneficial to identify mathematical areas where learners were struggling or misguided around concepts, as these concepts were in the very process of being formed. The starting point of the Lesson Study cycle was therefore embodied in the understanding of what and how concepts should be taught. This, instead of the question: "What concepts have not been grasped?" The subtle difference between these two approaches had far-reaching implications for the preparedness of the facilitator and teacher participants in this study. It became apparent that the goal of the lesson should be based on the participating teachers' in-depth conceptual understanding of a topic rather than learner misconceptions.

The following figure summarises the slight adaptation of the steps taken in the Lesson Study cycle implemented in this case study to better suit the needs of early grade teachers.

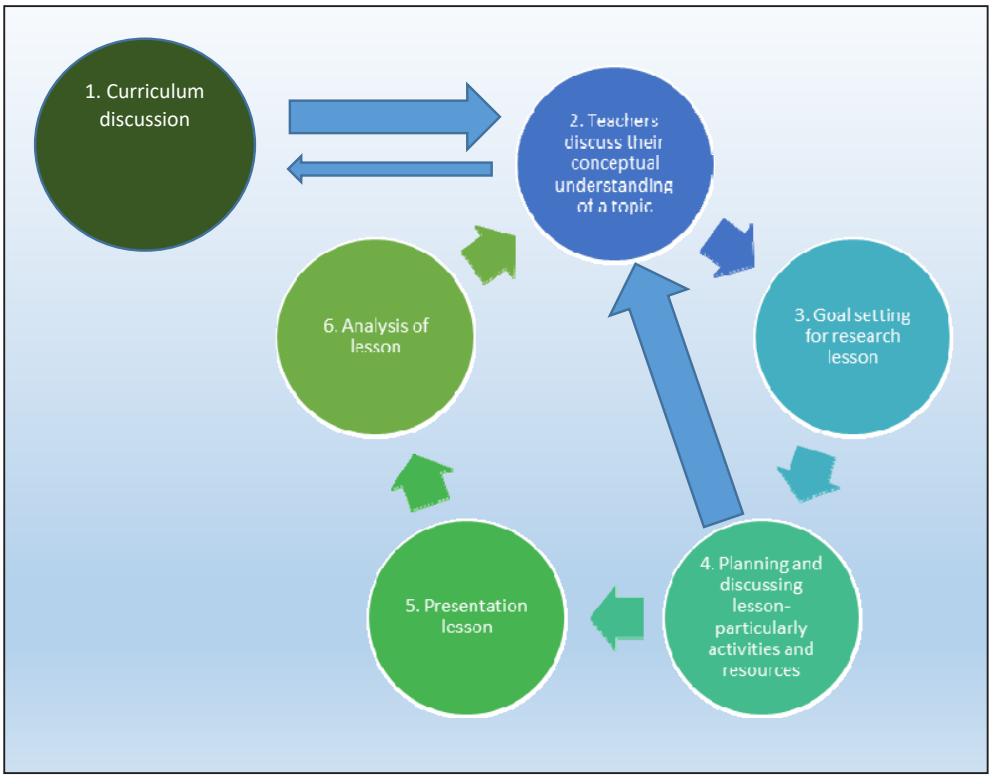

Figure 1: Adaptation of Lesson Study model utilised in this study

The Lesson Study participants spent a substantial portion of time (approximately 4 hours) in broadly discussing the curriculum and its division across the teaching weeks (circle 1 in figure 1) before embarking on planning the first research lesson. It was apparent in the second and third Lesson Study cycles that these should begin with discussions increasing the conceptual understanding of the participants (circle 2). This preceded the goal setting stage (circle 3). Once goals were established, it became easier to discuss possible lesson activities to meet these (circle 4). These discussions had the potential to affect conceptual understanding again (circle 1). When the final activities were selected and the lesson flow was refined, the remaining stages of the Lesson Study cycle proceeded according to the expected model (circles 5 and 6) (see Groves, *et al.,* 2013:10).

5.2 Facilitation

The role of facilitation was fraught with challenges. Finding the balance between training and facilitating was difficult. It was also difficult to ensure that participants did not monopolise the conversation. One of the most stressful aspects of the facilitation process was not having a clear "road map" to guide the sessions. The process of facilitation involved constant consideration of many personal and professional factors, making it emotionally, mentally and physically challenging.

5.3 Participant fear

An unresolved challenge for the study was the fear that participants faced in presenting demonstration lessons in front of their peers and visiting teachers. Although every effort was taken to emphasise that observation was to be directed at the learners' learning, and that the teacher presenting was not the focal point of the observation process, participants remained fearful of this aspect. A secondary challenge associated with being a presenting teacher was the additional pressure they felt to perform during the sessions building up to the demonstration lesson. This was mitigated in the last cycle by keeping the identity of the presenting teacher unknown until the day of the lesson.

5.4 Communication gaps

Challenges were noted around clear communication among participants. As found in their journal entries, teachers were largely aware of their communication shortcomings, including a propensity for speaking across each other or expressing themselves unclearly. The Lesson Study process highlighted these deficiencies, but also provoked a desire in some participants to change their poor communication habits. There was evidence of a small measure of improvement in interpersonal communication through the study.

5.5 Timetable considerations

This study employed the full cooperation of the school management, who were particularly supportive in rearranging the timetable for demonstration lessons. The sessions for lesson discussion and design were held outside school hours. Although participants complained about their tiredness on several occasions, they all voluntarily remained committed to attending planning meetings for the full three cycles. Their motivation to do so might, however, be attributed to their knowledge that the study was a professional development exercise and a research project.

A more considerable challenge to the Lesson Study process and school timetabling was timetable clashes between the host school and those of surrounding schools. Teachers from surrounding schools were repeatedly invited to attend demonstration lessons. Most schools declined the invitation to attend because of their different timetables. It was only in neighbouring schools where management was motivated to send their staff (they made their own alternative timetabling arrangements or had reserve staff in the form of assistant teachers), that visiting teachers could attend.

5.6 Too many activities

A final challenge was the repetitive problem of including too many activities in demonstration lessons. This propensity made the research lessons quite full and compromised on the presenting teacher's ability to follow through with the entire proposed lesson plan.

6. CONCLUSION AND RECOMMENDATIONS

This article attempted to address a documented knowledge lacuna around the impact of implementing Lesson Study at an early grade level in a South African context. Although some challenges of implementing this PD approach were noted, they were not insurmountable, and the evidence garnered here suggested that Lesson Study was a versatile, contextually relevant and enjoyable tool of professional development for teachers in earlier grades. Lesson Study provided a practical structure towards implementing the ISPFTED goal of growing

PLCs in local schools. It would behove school managers and teachers to recognise the benefits of Lesson Study and take deliberate steps towards implementing this resourceful tool at a grass-roots level. We recommend that further research be undertaken to ascertain the longevity of the impact on participants, the influence of the role of the facilitator in the Lesson Study process and the benefits of Lesson Study collaboration, not only across different school grades, but across school phases.

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