'Personal' and 'environmental' influences on teacher learning in lesson study

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Abstract: This study uses zones of enactment theory to analyse the case of a primary Art teacher and the influence of personal and environmental sectors on her learning through lesson study. Our analysis draws on qualitative data and findings indicate that lesson study created social enactment zones with pupils, the teaching resources she developed and her knowledgeable others. The lesson study context and the social aspect of teacher learning were heightened by the teacher's personal resources. Her personal resources – beliefs, knowledge and disposition for learning – enabled her to recognise learning opportunities and became better informed about changes to improve her professional practices.

Keywords: Art education; lesson study; professional development; teacher learning.

Introduction

Educational research has seen an increased impetus for teachers to engage in continuing professional development (PD) to enhance their learning and improve their professional practice (Vermunt et al., 2019). Research shows that teachers' ongoing, active, collaborative and reflective engagement in researching their classroom practices provides better learning opportunities for them when compared to other non-participatory PD activities (Golding, 2017; Stoll, Harris & Handscomb, 2012). One example of a continuing PD model that has shown to provide a robust approach for teacher learning is lesson study (LS) (Cheng, 2019; Lewis et al., 2013).

LS involves a group of teachers who collaboratively identify and study a pedagogical issue while they plan, teach and evaluate a lesson (Huang,

Takahashi & Ponte, 2019). The flexible nature of LS makes it possible to adapt it in ways that can suit the needs of teachers working in specific school contexts (Calleja & Formosa, 2020). Within the rapidly emerging body of literature on LS, there still seem to be inconsistencies about how LS enhances teacher learning (Murata, 2011). A recent literature review by Kager, Mynott and Vock (2023) shows that the way teachers learn through LS study remains insufficiently conceptualised.

The research presented in this paper is an attempt to analyse the teacher learning opportunities generated by a teacher's engagement in LS. Although collaboration is synonymous with LS (Cheng, 2019; Huang, Takahashi & Ponte, 2019), this paper focuses on the learning of a solitary primary school Art teacher in Malta. For the Art teacher (Laura, the first author of this paper), collaboration with teacher-colleagues was limited because in her school she was the only Art teacher. With the onset of LS, the Art teacher worked with a Grade 4 teacher, two learning support educators and a university-based LS facilitator (James, the second author of this paper).

In this paper, we examine teacher learning through the enactment of LS – that is, the professional learning opportunities arising from the Art teacher's ongoing and collaborative engagement with LS – and how the LS process served to enhance her professional growth. To do this, we draw on the zones of enactment theory (Spillane, 1999) to explore the interplay between the teacher's personal resources (her knowledge, beliefs and practices, and her disposition for learning) for engaging in a LS and the influences that environmental sectors had on her professional learning. Our discussion of the findings is then linked to implications for PD initiatives that may generate learning opportunities when teachers' personal resources are challenged.

Literature review

Teacher learning
Researchers conceptualise teacher learning either using cognitive approaches or sociocultural theories of learning. Cognitive approaches view teacher learning as residing exclusively in teachers' minds and envisaged as the skills, knowledge and understandings acquired by teachers in and for a specific setting (e.g., the classroom) and which they will then be able to use in similar settings (Kelly, 2006). On the other hand, sociocultural theorists recognise the social and cultural contexts in which teachers work, and that learning is co-created through negotiations among teachers, other educators and the tools that they use. Teacher learning is, hence, a social activity where learning becomes a process of moving from peripheral to full participation (Lave & Wenger, 1991).

Within sociocultural theories, one's engagement in social practice is taken to lead to a deep understanding of practice and the generation of 'new' knowledge. Knowledge is, hence, socially created (Lave & Wenger, 1991) and, as Schön (1983) explains, professional knowledge is knowledge-in-practice, that is, knowledge which is grounded in the professional activity of practitioners and created within the context of their work. Schön (1983) also proposes that this requires a process of reflection-in-practice which involves the ongoing negotiation of the knowledge-in and the knowledge-of-practice. Hence, knowledge-in-practice requires teachers to think and while it resides within them it is also distributed among practitioners and across the varying contextual factors such as pupils and the physical resources afforded by the school (Kelly, 2006).

The collaborative nature of LS and the specific context within which the Art teacher operated, leads us to a conceptual framework that draws on sociocultural theories of teacher learning. Sociocultural theories construe teacher learning as originating in social interaction with the role of culture, values and social and discursive practices being central to the learning process (Vygotsky, 1986).

Teacher learning within lesson study
According to Smith (2007), teacher learning is enhanced when PD is ongoing, collaborative and offers a safe environment where participants can engage in reflective practice. Research also indicates that PD is also effective when it is connected to classroom practice, aims to improve pupil learning, involves action research, includes outside experts, and is sustained by the school (Stoll, Harris & Handscomb, 2012). As a PD model, LS incorporates many of these characteristics (Cheng, 2019) and, as a result, has grown steadily to become a widespread model for teacher learning (Dudley, 2015).

LS is recognised as beneficial for improving the quality of teacher learning (Vermunt et al., 2019) particularly in promoting teacher collaboration, developing teachers' knowledge, and supporting teachers in eliciting and improving pupils' thinking and learning. For example, following research with 59 primary, secondary, and special schools, Vermunt et al., (2023, p. 1) found strong relationships between "teacher learning, professional identity, quality of dialogue, school support, lesson study, and student learning". Also, Lewis et al. (2013) show how teachers, working within three different mathematics LS groups, developed their professional learning. For example, Lewis et al. (2013) note that these teachers extended their content knowledge, were more able to stimulate and analyse pupils' thinking, demonstrated increased curiosity about the subject, recognised the importance of problem-solving and employed multiple representations to model mathematics problems.

The study by González and Deal (2019) shows three visible changes related to teacher learning through LS – increased pedagogical knowledge, the development of teaching resources and the development of teachers' professional community. In another study, Færøyvik Karlsen (2019) suggests that shared ownership of the challenges encountered in LS and teachers' desire to change and improve the lesson were central to the process of teacher learning. Evidently, teachers engage in LS to learn new knowledge as they seek to improve pupil learning (Dudley, 2013). Warwick et al. (2019) and Tamura and Uesugi (2020), for instance, examined the role of pupil voice. These studies suggest that teachers' consideration and analysis of pupil talk provided opportunities to interpret pupil learning. While serving as a source of challenge, the central focus of viewing the classroom experience from the perspective of pupils contributed to teacher learning in LS.

Teacher learning in lesson study through reflective practice
Reflection is often linked to action (Dewey, 1910) and presupposes a deep and interpretative process whereby careful judgement is made. Reflection, which involves a thinking process, is usually characterised by an active, persistent and careful consideration of one's beliefs, practices and knowledge. In teaching, reflective practice is seen to improve student learning and, as Schön (1983) notes, can happen before, during or after the teaching activity.

Gutierez (2015) found that the supportive environment of a LS community and the reflective practices visible in LS create an opportunity for teachers to adapt and transform their teaching practices. Notwithstanding these claims, however, for teachers to modify their practices, they need to be intrinsically motivated to learn; they need to have the will and the disposition to critically assess their practices and to consider alternative practices and beliefs (Hashweh, 2003). Engaging in reflective practice is not a given and is not automatic in LS (Myers, 2012). Indeed, the depth and the level of reflective engagement during post lesson discussions vary from one LS to the other, with some LS participants remaining at surface level; for instance, discussing logistics rather than going deeper as to whether the intended lesson objective had been achieved (Ono, Chikamori & Rogan, 2013). Teachers require the ongoing support of their colleagues and guidance from knowledgeable others or facilitators on approaches to engage in reflective practice of their practices (Moon, 1999). Within a LS setting, a climate of trust, collaboration, reflective practice and dialogue contribute towards the creation of transformative practices and an opportunity for teachers to move from a descriptive way of reflecting (Gutierez, 2015) towards a more critical reflective judgement stage. Having said that, ultimately it is the individual teacher who regulates the process of learning (Hashweh, 2003).

Sociocultural perspectives of examining teacher learning within lesson study
In studying teacher learning within LS, researchers have used a range of

sociocultural theoretical frameworks. One example is the analysis of the role of professional discourse in teacher learning (Suzuki, 2012). Dudley (2013), for example, analysed teachers' discourse during LS to study teachers' development of knowledge as they engaged in social interactions through talk. According to Dudley, this analytical approach highlighted how talking about pupil learning in LS enhanced teachers' tacit knowledge.

Wake, Swan and Foster (2015) examined teacher learning using the cultural-historical activity theory that views human work as an activity system. They analysed the role that designed artefacts (e.g., a lesson plan and teaching resources) within a mathematics LS play in teacher learning. As the authors illustrate, the issues anticipated and encountered by teachers within the overall lesson planning served as key artefacts and these LS artefacts serve as boundary objects that prompted collaborative thinking and enhanced boundary crossing in ways that enabled teacher learning.

Using the concept of professional capital, Cajkler et al. (2013) explored collaborative teacher learning. Professional capital – including the human, social and decisional capital of teachers – supports the identification of tools to develop teachers' capabilities. LS was found to strengthen teacher collaboration that eventually yielded to greater willingness to take risks in adopting pedagogies that enhanced pupils' independent learning. According to Cajkler et al. (2013), through collaboration (social capital) LS offered opportunities for teachers to develop their knowledge about teaching (human capital) while also gaining more confidence for risk-taking (decisional capital).

Research question

Our literature review shows the use of different sociocultural perspectives of teacher learning. While we also adopt a sociocultural view to examine the Art teacher's learning in LS, we chose to focus on Spillane's (1999) theory of zones of enactment because it considers the 'personal' resources of the Art teacher (her beliefs, knowledge and disposition for learning) and 'environmental' sectors (working context, pupils, policy, public and curriculum materials) as central to learning in LS. Based on this, our study is guided by the question: "*How do personal resources and the influence of environmental sectors shape an Art teacher's learning within lesson study?*"

Theoretical Framework

Zones of Enactment
Zones of enactment are defined as the space in which teachers "make sense of, and operationalize for their own practice, the ideas advanced by reformers" (Spillane, 1999, p. 159). This space, which could be a social media platform, a classroom, a staffroom or some other formal and informal gathering within and

beyond the school, is the place in which teachers encounter new initiatives that have the potential to enhance their professional practices. According to Spillane (1999), PD initiatives are usually encountered and enacted through the influences that environmental factors – *pupils* (and their response to learning), *professional* (working context), *private* (textbook and curriculum publishers), *public* (communities external to the school) and *policy* (national and school policies) – have on teachers.

Spillane (1999) proposes a model to account for the way teachers respond to and enact reforms. The model in Figure 1 positions teachers' *personal* resources for learning as central to their professional learning. Teachers notice learning opportunities based on their *personal* resources. Such noticing, defined by Mason (2002) as the act of taking up an idea and putting it into practice, is not automatic for all teachers. Learning opportunities may arise from within their environment – *pupils*, *professional*, *private, public* and *policy*. When teachers encounter new ideas about practice, they process them through their *personal* resources, eventually becoming aware of something they can adopt. In Spillane's (1999) model, the two-way arrows linking the *personal* to the *pupils*, *professional*, *private, public* and *policy* represent the influence that environmental sectors may have on teachers' existing knowledge, beliefs, practices and dispositions and, therefore, on what they notice as powerful for their learning.
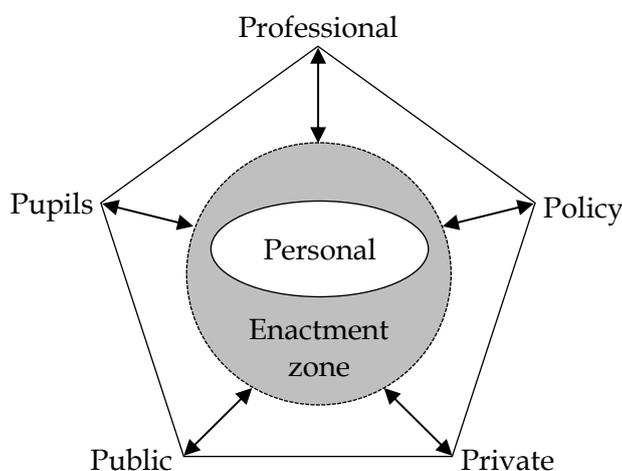
Figure 1: Zones of enactment model adapted from Spillane (1999)

Environmental sectors
  (1) The *professional* sector considers the school environment and how it shapes the way teachers work, whether and how they collaborate, plan lessons, teach and develop professionally.
  (2) *Policy* refers to the school's teaching, learning and assessment policies influenced by the broader national or regional policies.

(3) The *private* refers to the influence that textbooks and curriculum publishers have on teachers' autonomy to design, implement and evaluate teaching resources.

(4) The *public* includes those involved in reform enactment (e.g., lesson study). These could be: (i) educators who support teachers (directly and indirectly, for example, a subject head of department or a teacher educator), and (ii) individuals interested in learning about reform enactment.

(5) *Pupils* represent a key role as teachers are usually sensitive to how their pupils respond to learning activities. Teachers' perception of pupils usually influences their classroom practice, selection of tasks and the responsibility they give to pupils.

The way in which the above five sectors influence teacher learning about practice depends largely on what teachers notice in relation to their existing personal resources. Zones of enactment that are social promote change in both the personal resources of teachers and how they learn. This means that PD has the potential to create enactment zones that extend beyond individual classrooms to include collaborative deliberations among teachers and knowledgeable others enabled through the use and development of teaching resources.

Methodology

The case study
Happening within a Maltese primary school, we draw on a case study approach, defined by Yin as an "empirical inquiry that investigates a contemporary phenomenon within real-life context" (p. 13). Our case is represented by an Art LS that took place in two boys' Grade 4 classes aged 8 years old.

We sought to examine how the Art teacher enacted LS within her classroom, her school setting and the Maltese educational context. To analyse and communicate our interpretations of the LS events that unfolded, we consider the case of this Art teacher as unique given that she was a teacher within the school who had limited opportunities of subject-specific PD but was willing to take up LS for her professional learning. With this in mind, we consider the Art teacher as a learner and, as authors, we tried to capture her reality as accurately as possible seeking thick description of her encounters with the LS process, experiences, feelings and insights about her learning. We did this by taking a self-reflective approach to the Art teacher's engagement and our participation in LS. As researchers, we engaged in a reflexive process (Ball, 1990) involving ongoing deliberations that helped us remain aware of our personal influences in interpreting the Art teacher's LS enactment. Indeed, given the insider position (Calleja & Formosa, 2024) of the Art teacher, reflexivity was essential and personal biases were inevitable.

Trustworthiness and credibility

During the entire research process, reference was made to the criteria set by Lincoln and Guba (1985) to ensure trustworthiness and credibility. Importance was given to *prolonged engagement, persistent observation, triangulation* and *peer debriefing.* The Art teacher worked within the same school where the study took place, and she was present on the school premises daily. This resulted in her *prolonged engagement* and *persistent informal observation* of the daily practices and conversations taking place within the school. This gave her the opportunity to learn the culture of the school directly (Lincoln & Guba, 1985) and build her own perspectives and perceptions of the teaching and learning practices. To enhance the credibility of this study, the Art teacher strove to be as truthful and honest as possible in her reflective writings of learning moments within her LS journey; writings which were essential data for this qualitative study. In other words, for the scope of this research the Art teacher, who also assumed the role of researcher, had to "go native" (Lincoln & Guba, 1985) which meant that her immersion within the researched context could provide rich, first-hand data of the learning experiences that LS created.

To address the credibility of these findings and interpretations, triangulation was used amongst the various data sources (Denscombe, 2014). The reflective journal and pupils' post lesson writings provided "contextual validity" in which a piece of evidence could be "assessed by comparing it with other kinds of evidence on the same point" (Lincoln and Guba, 1985, p. 306). These two data sources were analysed and compared to achieve more accurate and transparent findings and to "provide a fuller and more complete picture" of the subject being studied (Denscombe, 2014, p. 147). While the accounts written in the Art teacher's reflective journal served as a key data source, a university-based LS facilitator served as a *peer debriefer* (Lincoln & Guba, 1985). In his role, as an outsider to the school context, he could probe the Art teacher to challenge her biases and collaboratively explore meanings and interpretations.

Art education in the Maltese context

Art education is one of the learning areas taught in primary and secondary schools in Malta (MEYR, 2012). Despite the flexible pedagogies that Art teachers enjoy (DLAP, 2015), in Malta Art education does not hold a considerably high status, and it is often considered as a marginal subject when compared to core academic subjects such as mathematics, Science and the Languages. This is reflected in the percentage minimum entitlement for Learning Areas taught in primary schools, with 60% of time dedicated to the teaching and learning of STEM subjects when compared to only 5% dedicated to the Arts (MEYR, 2012). Primary school classroom teachers tend to lack confidence, attitude and feel unprepared to teach the Arts (Russell-Bowie 2012). Hence, they prefer to delegate the responsibility of teaching the Arts curricula mostly to the Arts peripatetic teachers, claiming that time is an issue and that they do not have the competency to teach such subjects (Zammit,

1998). Indeed, subjects that cannot be tested using standardized means, like the Arts, tend to be marginalised (Eisner, 2003).

Gatt and Karppinen (2014) mention that Art teachers need PD that helps them delve deep into their knowledge and skills of teaching the subject. Unlike the academic core subjects, Art teachers usually lack school-based PD that is subject-specific. This situation coupled with LS, which at the time of this research was still in its infancy in Malta (Calleja & Camilleri, 2021), offered a unique research activity which we envisaged could contribute important insights about LS as a professional learning opportunity for Art teachers.

The focus of the Art lesson study
Following a 12-year teaching experience, the Art teacher sought to engage in a more meaningful, collaborative, PD experience that would be relevant to her subject-specific needs. She identified an Art concept which her Grade 4 pupils struggled with – grasping an understanding and applying the concepts of foreground, middle ground and background (FMB) in an artwork. From the Art teacher's observations throughout the years, pupils struggle to appreciate how objects are portrayed in images (in photography and in paintings); how artists play with these levels in their creations to make good use of space; how objects may overlap other objects in the different grounds; and how size and colour vary on each ground. For these reasons, this LS sought to provide Grade 4 pupils an opportunity to observe, think critically and discuss how FMB are used in images while creating their own collage.

The Art lesson study participants
During the LS process, the Art teacher identified participants who could support her in building a LS community (see Table 1). Notwithstanding her isolated context, the Art teacher sought opportunities to discuss and collaboratively plan her work with the Grade 4 class teacher and two learning support educators. The head of school, together with the university-based LS facilitator, were present for the two research lesson trials and post-lesson discussions. Members from the Faculty of Education at the University of Malta were involved as knowledgeable others at the planning stage (the Art education expert and the LS facilitator), in the lesson observations and the post-lesson discussions (teacher educators). Unlike the Japanese model of LS, where a knowledgeable other is invited to provide final comments at the end of a post-lesson discussion (Takahashi, 2014), in this LS knowledgeable others (e.g.: the Art education expert) provided feedback and insights during the lesson planning phase. The case of being the only Art teacher at school was the main driving factor why the Art teacher invited knowledgeable others (see Phases 3, 4 and 6 in Table 2), mainly so that she could draw on external expertise at different stages of the LS process.

	Participant	Institution	Experience in education (in years)
The LS group	Art teacher	Primary school	Over 10
	LS facilitator	University of Malta	Over 25
	Class teacher	Primary school	Over 5
	Learning support educator 1	Primary school	Over 5
	Learning support educator 1	Primary school	Over 5
Knowledgeable others	Art education expert	University of Malta	Over 20
	Teacher educator 1	University of Malta	Over 25
	Teacher educator 2	University of Malta	Over 20
	Teacher educator 3	University of Malta	Over 35
	Teacher educator 4	Secretariat for Catholic Education	Over 20
	Head of school	Primary school	Over 25

Table 1: The LS participants

The Art lesson study process

The LS process (see Table 2), which took eight weeks, included an average of four hours of weekly face-to-face meetings and online communications between the Art teacher and the LS facilitator. During the lesson planning phase, a two-hour face-to-face meeting and email communications with feedback with an Art education expert were held. Through this period, the Art teacher and the class teacher engaged in ongoing conversations, discussing issues such as pupils' learning abilities and needs to consider while planning the lesson, strategies that the class teacher finds effective in her lessons which could be useful for the Art teacher, and possible teaching resources to use. The class teacher was also present for both lesson observations and post-lesson discussions.

With guidance from the LS facilitator, during the LS period, the Art teacher engaged in ongoing critical self-reflections. These were instigated by critical incidents (that is, when a behaviour, action or situation challenged the teacher's thinking about her beliefs and practices) which she discussed with the LS facilitator, the class teacher and knowledgeable others. The four-day gap between the two lesson trials (see Phases 3-5 in Table 2) allowed time for the Art teacher to make the necessary changes and amendments to the lesson plan as suggested during the post-lesson discussions.

Lesson study phase	Description of work and people involved	Timeline
Phase 1: Introductory meetings (*Pre-LS*)	• The LS facilitator discussed the LS process with the Art teacher • Art teacher and LS facilitator presented LS to the SLT • Art teacher discussed LS with the Grade 4 class teacher	December 2019 – January 2020
Phase 2: The research and study of resources (*kyozaikenkyu*)	Art teacher with LS facilitator and class teacher • Identified a challenging concept to teach • Looked into curriculum materials, textbooks and online resources • Considered short and long-term goals for pupil learning	January 2020
Phase 3: Lesson planning	Art teacher with LS facilitator, class teacher and Art education expert • Devised a detailed lesson plan • Considered pupil thinking • Prepared a data collection sheet for observers	February 2020
Phase 4: Teaching of the lesson	• Research lesson 1 - teaching the lesson and data collection by the following observers: (a) LS facilitator (b) two knowledgeable others – an Art education expert and a teacher educator (c) three school educators – the head of school, the class teacher and learning support educator • Post-lesson discussion among Art teacher, LS facilitator and the observers mentioned above	March 2, 2020
Phase 5: Reflection on trial 1	• Discussion between Art teacher and LS facilitator • Teacher amended lesson plan and resources	March 3-5, 2020
Phase 6: Re-teaching of the lesson	• Research lesson 2 involving the teaching of the lesson and data collection by the following observers: (a) LS facilitator, (b) three knowledgeable others: two teacher educators and a PD leader, (c) three school educators: the head of school, the class teacher and learning support educator Post-lesson discussion among Art teacher, LS facilitator and the observers mentioned above	March 6, 2020
Phase 7: Reflection on trial 2	• Discussion between Art teacher and LS facilitator	March 2020

Phase 8: Dissemination (*Post-LS*)	• LS report • Published a paper in a peer-reviewed journal (see Calleja & Formosa, 2020) • Presentation at The World Association of Lesson Studies (WALS) conference	April – December 2020

Table 2: The LS phases, description and timeline

Data collection

In this research, LS is conceived as consistent with action research as it was a collaborative and self-development process whereby the Art teacher could better understand herself and her practices (Lewis, Perry & Friedkin, 2009). Hence, we drew on qualitative evidence using three data sources:

- *The Art teacher's reflective journal*: As our main data source, the Art teacher kept a reflective journal. Her reflections included lengthy accounts of discussions with the class teacher, knowledgeable others, experiences about each phase of the LS process, the challenges she encountered and how she attempted to resolve them, and the ensuing learning opportunities. The Art teacher also engaged in ongoing discussions with the LS facilitator about her written reflections which included a total of 13 reflections amassing almost 12000 words.
- *Pupils' post-lesson writings*: After each lesson trial, the Art teacher invited pupils to write their own reflective writings about the lesson. Pupils' writings involved short phrases or sentences that captured their feelings and experiences of the lesson.
- *Lesson study report*: The two authors documented the whole LS with the steps taken and decisions made in an online report available and downloadable at www.clestum.eu/reports. From this report, we drew on written feedback provided by knowledgeable others and those who observed the lessons and participated in the post-lesson discussions.

Data analysis

For data analysis, we used a hybrid approach to qualitative thematic analysis using staged iterative coding (Braun & Clarke, 2006). This involved pattern recognition within the data incorporating a data-driven deductive stage (using the five environmental sectors) followed by an inductive stage (Boyatzis, 1998). Coding began by reviewing the data and deductively coding it following Spillane's (1999) zones of enactment theory. For example, descriptions relating to the school context were coded as 'professional'. The other deductive codes used were 'pupils', 'policy', 'public' and 'private'. Codes were constructed by the authors and, hence these were subject to bias. To address this issue, and to make our codes as transparent and credible as possible, we followed the suggestion of O'Connor and Joffe (2020) and adopted intercoder reliability. This meant that we both conducted this coding process independently of each other, following which we then convened to discuss and finalise the themes.

The next step involved inductive coding which involved close reading of the text and the consideration of possible meanings. The Art teacher's reflective writings were then divided into short paragraphs of between 20 and 40 words – applying an open-ended coding technique to label comments and assign codes. Initial codes focused on significant issues, comments and feelings that reflected the Art teacher's thoughts and expectations of LS. Codes and comments were then compared and grouped to create themes. The analytical process then involved comparing deductive and inductive codes that eventually accompanied the emergence of themes.

Data source	Deductive code	Inductive code	Theme
Reflective journal	Professional	Lone practice at school Collaboration (or lack of) LS as a PD model Knowledgeable others Role of school leadership	LS enacted within a lone school culture induced alternative forms of collaboration and professional learning
Reflective journal Pupils' survey	Pupils	Rethinking practice Resources for teaching Lesson structure Lesson activities	The focus of LS on pupil learning sustained the teacher's uptake of alternative approaches to teaching Art
Reflective journal Policy documents	Policy	Art within the Maltese education system Assessment practices Flexible curriculum	Curriculum flexibility allowed opportunities for the teacher to implement changes through LS
Reflective journal	Private	Being an Art teacher Teacher autonomy Teaching resources Own classroom	Teaching Art afforded more teacher autonomy to design, implement and evaluate teaching resources within LS
Reflective journal Lesson study report	Public	Networking Knowledgeable others Lesson study report Dissemination	LS facilitated opportunities to network, learn with and from knowledgeable others and disseminate practices

Table 3: Deductive and inductive codes generated from the data

Ethical considerations
This LS delved into the privacy of a school and a particular classroom context. Hence, we took into consideration several ethical issues to safeguard those involved. We first obtained ethical approval from the University of Malta research ethics committee. An initial meeting was held with the SLT to provide them with an overview and the benefits of LS. Following this, informed consent

to proceed with the study was obtained from the head of school and the parents of pupils involved.

Results

We refer to Spillane's (1999) ZoE theory and describe how the teacher's disposition to learn, her personal resources (beliefs, knowledge and practice) for learning and the interplay of each environmental sector upon her LS enactment led to teacher learning.

Professional: Enacting LS induced alternative forms of collaboration and professional learning
The school experience prior to the LS was rather an isolated one for the Art teacher. She was the only Art subject specialist within the primary school, teaching around 450 pupils. School-based PD was organised by the SLT and focused on general teaching strategies around the teaching of core subjects. This was rather distant from the teacher's Art classroom reality. In one of her initial writings, the Art teacher wrote:

> *PD sessions are quite irrelevant to my classroom reality and my subject. They centre around assessment, homework; leaving behind the practical components that subjects like Art require. (Reflective journal, entry 2)*

This situation generally meant that the PD content had limited relevance or applicability to the teaching of Art. Art-related PD were self-sought and done out of the teacher's own interest, research and personal time after school. This situation meant that, at school, working in isolation was the norm for the Art teacher.

> *I lack opportunities to work in a group as I have no common curriculum time with other teachers due to my packed timetable. (Reflective journal, entry 2)*

Over time, this situation led her to conceptualise PD at school as limited to the confines of her classroom, and opportunities for moving out of her comfort zone and critically analyse her teaching practices as impracticable. Besides, altering or modifying her teaching practices would have rendered a complete shift in well-ingrained routines, which the Art teacher felt she had long established and refined throughout her teaching experience. Her initial reaction to feedback she received from the LS facilitator exemplifies her personal struggles:

> *I was convinced that the activities I had planned were very appropriate to reach the lesson goals. So, when I received his [the LS facilitator] feedback, I felt disheartened and disappointed. (Reflective journal, entry 8)*

As a PD model, LS challenged the Art teacher's personal beliefs and practices as it offered a contrasting experience to school-based PD. Through LS, the Art teacher had opportunities to discuss teaching and learning with another (class) teacher, to open her classroom doors and to collaborate with knowledgeable others. Also, the Grade 4 class teacher reflected on the opportunity of LS to instil positive collaboration:

> *I saw how collaboration between different educators could be done. Working together enhanced opportunities to seek new approaches to teaching and to improve already existing ones, ultimately to make learning more attainable for students. (LS Report, Grade 4 teacher reflection)*

LS offered new collaborative opportunities that were previously absent. Nevertheless, the change was arduous and, occasionally, professional conversations led to cognitive conflicts (Calleja & Formosa, 2020) between the Art teacher's existing personal resources and the ideas shared by knowledgeable others. Through these experiences, she reflected more deeply on her teaching, gaining insights both at a personal level (where she worked on her self-confidence, values and beliefs) and at a professional level (rethinking her own teaching practices and classroom strategies).

Pupils: The focus of LS on pupil learning supported the Art teacher's uptake of alternative approaches to teaching Art
The Art teacher's perceptions of her pupils had an important influence on her classroom practice, on her selection of lesson resources and on how she developed tasks. Notwithstanding the Art teacher's knowledge of her pupils, it seemed that initially her preconceived ideas about them were limited to her own understandings. However, following discussions with the class teacher and knowledgeable others, she realised she could provide more challenging questions and tasks that extend pupils' learning potential. During the lesson planning phase, the Art teacher reflected on this aspect:

> *I tend to overlook the potential my pupils have and take certain things as obvious. I think I know their artistic skills and learning needs because I have been teaching them since Grade 1. Yet, I feel that this sometimes limits the way I plan my lessons. (Reflective journal, entry 7)*

The Art teacher took on board the recommendations by the LS group, including those of the Art education expert:

> *We made a few changes to the lesson plan mostly related to the choice of images and the collage task. (LS Report, Art education expert reflection)*

During the lesson planning stage, the Art teacher made several considerations related to whether to engage pupils in individual work, pair work and/or

whole-class discussion. Following several rounds of deliberations and considerations, the Art teacher took up ideas negotiated with knowledgeable others and the class teacher. The post-lesson discussions held with lesson observers and the written feedback collected from pupils suggested that pupils enjoyed the activity, grasped the concept and applied it successfully in their final collage. Pupils were actively involved in discussions with their peers, and expressed their enthusiasm and positive feedback in the post-lesson comments:

> *I liked the lesson because I liked working in pairs and be creative doing a collage. We could use different materials than we usually use during our lessons. (Comments, pupil 4)*
> *I learned that an object in the background is smaller than something which is in the foreground. (Comments, pupil 8)*

This enthusiasm was also expressed by one of the university-based teacher educators during the post-lesson discussion following the first lesson trial:

> *No student was left out as each one was given the opportunity to actively participate at his own level. The students were really motivated and did not only answer the teacher's questions but elaborated on them showing that they were very attentive and immersed in the lesson. (LS Report, teacher educator 3's reflection)*

In enacting her LS, pupils served as a source that challenged the Art teacher's beliefs, knowledge and practices of teaching Art. The opportunity to negotiate her understandings with others enabled her to experiment with instructional practices, teaching strategies and tasks that gave a more active role to pupils in their learning.

> *I challenged myself and explored alternative teaching strategies. Whereas my typical lesson would be structured from easy to more difficult, guiding pupils through demonstrations or the provision of examples and models, in this lesson I wanted pupils to own their learning by engaging actively in exploring and experimenting with resources. (Reflective journal, entry 13)*

Policy: Curriculum flexibility allowed opportunities for the Art teacher to implement changes through LS
Learning outcomes within Art education encourage flexibility and adaptability. This is conducive for teachers to design more cognitively challenging lessons since curricula and syllabi are mostly process-oriented. Hence, pupils may follow unfamiliar paths when developing their creative self (DLAP, 2015). As reported by the Art teacher, this curriculum flexibility combined with the support received in the process of LS enabled her to adopt, plan and develop novel tasks.

Unlike my colleagues, who teach the core curriculum subjects and are bound to stricter routines and subject to high-stakes assessments, Art allows for the flexibility of how and when to teach concepts and skills. (Reflective journal, entry 13)

Flexibility within the Art curriculum generated opportunities to implement pedagogical ideas promoted by policy. For the Art teacher, LS helped her to shift from an implementer role to a more active and reflective designer of the curriculum.

Besides targeting the needs of my pupils, I feel LS gave me the opportunity to apply and evaluate curriculum ideas. (Reflective journal, entry 12)

This curriculum flexibility was also experienced by one of the teacher educators present for this LS:

I was intrigued by how pupils went about with their work in class without minding having observers. Thanks to this environment, which is uncommon in Maltese classrooms, I could walk around and observe pupils work and listen closely to their conversations. (LS Report, teacher educator 2's reflection)

Private: Teaching Art afforded more teacher autonomy to design, implement and evaluate teaching resources within LS
The Art teacher could explore and make use of varied materials and teaching resources that best suited the concepts she wanted her pupils to learn. Her personal resources as an Art teacher influenced how she enacted the *kyozaikenkyu* phase, that is, the extensive research process she engaged in to develop the lesson plan and resources.

I am being challenged in every way; how I normally see, plan and do things ... I am now dedicating more time to delve deeper into the subject and the concepts I want pupils to learn. Through this process I revisit my thinking, my teaching and planning strategies. (Reflective journal, entry 6)

Indeed, throughout the *kyozaikenkyu* phase the Art teacher researched and explored multiple activities and resources available online and accessed books which could be used to teach the FMB concepts. She engaged in ongoing research, discussions and reflections with the class teacher and the LS facilitator, ultimately recognising potential in the designed resources and selected tasks:

I wrote down my ideas and considered how to present the selected activities to achieve a better progression of the concepts. Along the process,

I also focused on the questions I intended to ask to stimulate pupils'
curiosity and creativity. (Reflective journal, entry 5)
Now, I look at my lesson plan from a more critical viewpoint. I learned to
change the structure of my lessons by starting with challenging, thought-
provoking tasks to arouse curiosity and interest and to see what the pupils
can come up with. (Reflective journal, entry 8)

The Art teacher sought to understand the problem in teaching FMB and
research ideas as part of the *kyozaikenkyu* phase of LS, explore alternative ideas
about possible tasks and lesson structure, put them in practice and finally
reflect on the outcomes with support from the class teacher and knowledgeable
others. This helped her to rethink practices and move away from a linear,
structured mode of planning to flexible approaches that could offer more
opportunities for her pupils to assume greater responsibility for their learning
(see Appendix for the changes made to the lesson).

Public: LS facilitated opportunities to network, learn with and from knowledgeable
others and disseminate practices
Whereas teaching was a lone practice (Krainer, 2001) for the Art teacher, LS
offered her the opportunity to open her classroom doors to the public. The Art
teacher worked most closely with the class teacher and the LS facilitator who
guided her throughout the whole process, offering opportunities to self-reflect
and to critically evaluate her practices.

The LS facilitator provided me with rich insights, feedback and
suggestions which I may not have thought about or may have missed.
(Reflective journal, entry 6)

The LS facilitator also commented on how this thought-provoking
process challenged the Art teacher's personal resources:

Along the process, I realised that the feedback received generated dilemmas
and frustrations about teaching. The lesson study process challenged her
existing beliefs and practices because it necessitated a rethinking process
that eventually helped her to delve deeply into issues. (LS Report, LS
facilitator's reflection)

Changes in her personal resources were stimulated by the opportunities that
LS offered her to share beliefs and teaching experiences with her LS group.
However, such negotiations were driven by her desire to learn and her
disposition to improve on her knowledge and practice about teaching:

The opportunity to meet the Art expert enlarged my LS community with
possibilities of creating new knowledge. (Reflective journal, entry 7)

Learning within LS was twofold, where both the Art teacher and the LS

community members expressed positive outcomes gained from their involvement:

> *Learning was taking place on multiple levels, leaving me wanting to engage further into the practice of LS. (Report, teacher educator 1's reflection)*
> *The post-lesson discussion proved that sharing of resources, planning together and being open to one another's ideas inculcates a love to learn and improve. (Report, teacher educator 3's reflection)*

LS created new prospects for further professional networking and learning that extended beyond the teacher's Art room and school (see Table 1 Phase 8). This LS experience cultivated the Art teacher's disposition and capacity to disseminate her work to the wider public, particularly those interested in LS, research and teacher learning (Calleja & Formosa, 2020).

Discussion

This research sought to explore the question: "*How do personal resources and the influence of environmental sectors shape an Art teacher's learning within lesson study?*" First and foremost, this LS led the Art teacher to move away from her solitary practices and develop new connections that went beyond her classroom. Prior to the LS experience, the Art teacher taught in a solitary manner because of the limited opportunities to collaborate with others. While research suggests that the solitary practice of teachers limits their engagement in LS (Verhoef et al., 2014), our findings suggest that LS created collaborative opportunities for the Art teacher. Moreover, she embraced the idea of working with the Art teacher educator.

Secondly, we attribute teacher learning to her disposition to critically reflect on her personal resources. While the process of LS encouraged collaboration, this research suggests that her professional learning was prompted by a desire to rethink her knowledge about teaching Art, a disposition to be challenged about her beliefs about teaching and learning, and a desire to reconsider her classroom practices so that she could engage pupils more in the learning process (Dudley, 2013; Lewis et al., 2013). By examining teacher learning using Spillane's (1999) ZoE theory we find that, in the context of LS, learning can be stimulated and influenced by each of the five environmental sectors. Our findings indicate that not all sectors were equally influential for teacher learning; some offering more prospects for PD than others. While previous research using Spillane's (1999) theory has shown that teachers' social enactment zones are crucial for teacher learning (Calleja, Foster & Hodgen, 2021; Golding, 2017), for the Art teacher, the prospects within LS to exercise her autonomy supported the development of her personal resources for learning. Her disposition to reconsider, inform and shape her personal knowledge, beliefs and practices about teaching Art were instigated by other sectors –

pupils, *public*, *private* and *policy* – sectors which were previously less prominent. Notwithstanding the limitations that she perceived within the *professional* sector, for this Art teacher the onset of LS stimulated her to seek professional learning opportunities external to the school, and which eventually became more prominent in influencing this teacher's learning.

Thirdly, while research suggests that cultural influences may lead teachers to misinterpret LS and view it more as a product (Fujii, 2014; Kitada, 2022), for the Art teacher LS served as an ongoing collaborative and reflective process. Additionally, the present study suggests that engagement in LS allowed the Art teacher to become more autonomous and active in her own PD – she took more control of her learning, and this gave way to more teacher empowerment, commitment, ownership and personalised learning (Mezirow, 1997). This led her to seek opportunities for collaboration and learning that went beyond what the school context offered. Research on the social aspect of teacher learning and the benefits of deliberations, collaboration, reflection and support in LS are not new (Cheng, 2019; Dudley, 2013; González & Deal, 2019). However, using the ZoE theory we were able to examine teacher learning through the Art teacher's autonomous approach to enact LS. Taking ownership of her self-development (Lewis, Perry & Friedkin, 2009) facilitated deliberations in her search to improve her knowledge and practices by drawing on external expertise (*public*). Moreover, these deliberations were influenced by: (1) the *kyozaikenkyu* phase involving the Art teacher in research and design of artefacts that addressed the lesson objectives (*private*); (2) a realisation of the flexibility offered within the Art curriculum and related policies (*policy*); (3) an unceasing focus on improving pupils' learning (*pupils*); and (4) adaptations to enact LS within a lone school culture (*professional*). Indeed, findings suggest that her disposition and a more autonomous approach to learning (Mezirow, 1997) were crucial for her to combat the 'lone-fighter' school culture (Krainer, 2001).

Fourthly, within the LS process, the Art teacher noticed opportunities for learning while engaging in ongoing deliberations with the class teacher, the knowledgeable others and the LS facilitator. Such noticing (Mason, 2002) was enabled by the sociocultural practices of LS, that is, through the co-learning relationships and knowledge that were socially constructed. In line with studies by Cheng (2019) and González and Deal (2019), this research shows how LS could facilitate the development of a professional learning community. The *public* sector, hence, took a more prominent role in supporting the Art teacher and providing her opportunities to reflect on her teaching practices, teaching instructions and curriculum development. Within the *kyozaikenkyu* phase, the Art teacher noticed that the *private* and the *policy* sectors provided possibilities for her to become better informed in selecting materials and resources for her lesson. Moreover, this phase enabled her to put into practice the proposed reforms while taking on a critical perspective. Deliberations with knowledgeable others, hence, enabled the Art teacher to take advantage of the

flexibility of the Art curriculum (*policy*) which, in turn, helped her make more informed choices about pedagogical tools and materials that she used (*private*) to support the learning of her *pupils*.

Studies related to teacher PD suggest that when teachers are receptive to pupils' responses about classroom practices then pupil voice becomes a source for teacher learning (Sprott, 2019; Warwick et al., 2019). In the present study, the *pupils* sector created cognitive conflicts (Calleja & Formosa, 2020) and, in resolving these conflicts, knowledgeable others played a key role to support the Art teacher's LS enactment. Shared ownership of the conflicts and dilemmas encountered within LS were also highlighted in the study by Færøyvik Karlsen (2019) who described how teachers' disposition for improving practices were central to the teacher's learning process.

Conclusion

This study was conducted with the purpose of examining teacher learning using Spillane's (1999) ZoE theory. More specifically, using this theory, we sought to contribute to the body of knowledge in understanding teacher learning in the context of LS. This research was, however, limited to examine LS enactment of a solitary Art teacher who, prior to LS, had no opportunities to collaborate with colleagues and had not experienced subject-specific PD.

Our approach in using Spillane's (1999) theory helped us see that, when a school culture contrasts the culture of the PD model promoted, teachers may still draw on other sectors for their learning. In our case, the *public* supported the Art teacher's enactment of LS through ongoing negotiations and deliberations about teaching and learning influenced mostly by the *private*, *policy* and *pupils* sectors. This, we think, was not solely created by LS and the involvement of knowledgeable others, but also by the Art teacher's disposition to learn, reflect upon, challenge and eventually transform her teaching practices. For the Art teacher in our study, the *personal* sector was of utmost importance. In Spillane's (1999) ZoE theory this sector is central to the learning process and has potential in highlighting how teacher learning could be heightened when PD focuses on teachers' personal resources for learning.

We believe that this aspect has implications for the design of PD initiatives that promote teacher learning. Rather than implementing LS to address contextual factors, PD providers also need to adopt and adapt LS. Primarily, PD needs to be designed in such a way that it can address the personal needs and resources of teachers, specifically for those teachers working in isolation. This, we think, is an essential approach that schools need to take to ensure that all teachers, irrespective of the subject/s that they teach, are supported and provided with PD opportunities that address their immediate needs. Rather than adopting a whole school, top-down and expert-driven approach – that promotes an

expectation on teachers that PD must be provided by the school and is done on them – school leaders need to provide more individualised learning opportunities and promote self-sought PD initiatives that may be taken up by individuals and small groups of teachers. Through engagement in self-sought PD, teachers would be in a better position to determine both the focus and the type of PD that can address their professional interests and needs (Bezzina & Calleja, 2024). Indeed, one of the strengths of LS is that teachers' interests rest at the core of their learning process (Murata, 2011). However, as the present study suggests, teachers can maximise the opportunities offered by LS when they are: (1) inquisitive to learn, (2) research-oriented, (3) reflective and (4) have a personal disposition to learn with others.

School leaders' role in enhancing teacher professional learning
For this to happen, we think that school leaders have a key role to play, mainly in their approach to planning, designing and offering PD for teachers. Thus, we offer the following five recommendations:

(1) Schools should offer ongoing and long-term opportunities for teachers to learn and grow professionally as a community. School leaders need to create and sustain a culture where PD is an integral part of teachers' daily work, and LS is one approach whereby teachers can become committed to work collaboratively (Golding, 2017) as they share goals, discuss ideas and create new knowledge about teaching and learning.

(2) While planning for PD is the responsibility of the school, teachers need to take a more central role as co-constructors and co-designers. We call for PD opportunities that are sought and designed by teachers with the support of school leaders. To achieve this, we envisage school-based opportunities whereby teachers are active agents of their PD and through which their interests and professional needs are at the core. Within this approach to school-based PD, teachers have a say and take more control over their learning (Cajkler et al., 2013) and, in the process, become increasingly committed towards their PD.

(3) Within PD, teachers need to identify a desired object of learning not only for their students but also for themselves. To identify teacher learning goals, we think that teachers need support from more knowledgeable others – both insiders and outsiders to the school – whom teachers invite to help them reflect and identify possibilities for their learning, ask questions about personal and professional goals, and determine potential and sustainable pathways to achieve the set goals (Fujii, 2014).

(4) Teachers need support and guidance to develop and hone their skills to engage in critical reflection of their teaching practices (Moon, 1999). Teachers cannot be expected to be reflective practitioners if they are not provided with the necessary conditions and structures such as support, time, space, and an environment built on trust where teachers feel safe

to engage in conversations (Smith, 2007) to reflect critically about their assumptions and taken-for-granted habits of mind (Mezirow, 1997).

(5) Teachers, particularly subject teachers in primary schools, need professional learning time during school hours to discuss issues and make plans towards achieving their educational goals (Calleja & Formosa, 2020). School leaders need to be receptive and aware of the challenges and needs faced by Art teachers (Russell-Bowie, 2012) and support them with the logistics of, for example, providing them with a weekly timeslot to meet, and also cover any costs related to (a) hiring substitute teachers when they may engage in, say, lesson observations, and/or (b) developing teaching resources.

Final thoughts

In this paper, we have seen the influences of contextual and cultural constraints on a primary school Art teacher's engagement in LS and how her commitment to this kind of PD offered possibilities for learning. Indeed, as PD, engagement in LS challenged her to reconsider her existing knowledge, practices and beliefs. We think that, for teachers, PD is meaningful when it is context-specific, is "not merely generic" (Gatt & Karppinen, 2014, p. 85) and when teachers can take ownership of it. What really matters is that teachers are freed from control and entrusted to act as central agents of their professional learning, because teachers are the final policy brokers when it comes to making changes to classroom practices (McLaughlin, 1990). They are, indeed, the ones who will either enhance or hinder the enactment of any proposed educational reform.

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