Examining primary school teachers’ professional noticing through a video-based methodology

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Examining primary school teachers’ professional noticing through a video-based methodology

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Research context
Primary teachers’ noticing of mathematics and science lessons

Methodological focus/insights
The tension between the logistical and substantive aspects relating to the use of video and the nature of professional noticing captured

Theoretical stance
Socio-cultural learning theory

Additional issues highlighted, e.g. ethical or technical issues
Technological and methodological challenges in examining teacher professional noticing.
Introduction

This chapter examines methodological potential and challenges in using videos to capture and analyse teachers’ professional noticing of students’ reasoning in science and mathematics classrooms. The construct of teacher professional noticing as a key element for teaching expertise has gained increased attention over the last decade (Mason, 2002; Russ & Luna, 2013; Scheiner, 2016; Sherin & Russ, 2014; Sherin, Russ, & Colestock, 2011). Classrooms are multi-dimensional; multiple and unpredictable events often occur simultaneously and require teachers to attend, interpret, and decide how to respond in the moment as the lesson unfolds (Jacobs, Lamb, Phillip, & Schappelle, 2011). Noticing salient moments in classrooms is vital for teachers as they constantly have to act and make pedagogical decisions ‘on the run’. Unpacking in-the-moment noticing of teachers is quite complex as the dynamic interaction and relationship between various activities involved in teacher noticing is not obvious (Scheiner, 2016).

Video-based research approaches can be instrumental in capturing teachers’ attention to aspects of classroom interactions and in providing stimuli for teacher reflection on those events. They have become increasingly popular as a tool for educational research because of their unique ability to capture the richness and complexity of classrooms for later analysis (Brophy, 2004; Derry et al., 2010). Video records enable coding and analysis from multiple perspectives: they facilitate the integration of qualitative and quantitative analyses and provide the opportunity for re-analysis as new research questions emerge. LeFevre (2004) pointed out video makes teachers’ own classrooms accessible in a way that other mediums simply cannot, and therefore has the potential to be a powerful catalyst for change.

This chapter interrogates methodological challenges and assumptions underlying video-based research studies of professional noticing and addresses this particular question: to what extent does the video-based research methodology allow us to unpack and draw inferences about primary school teachers’ professional noticing? We illustrate how the employment of a video approach enabled the five primary school teachers to share and reflect on what they considered to be salient moments in mathematics and
science lessons. This chapter argues for the fundamental differences between human noticing and video capturing, and questions the problematic assumption that takes what was captured on cameras to be the same as what the teacher noticed.

The role of video in capturing and understanding teacher professional noticing

Teacher professional noticing is considered as “a collection of practices designed to sensitise oneself so as to notice opportunities in the future in which to act freshly rather than automatically out of habit” (Mason, 2011, p. 35). While there is a rapid expansion of research in this area, there is no standard conceptualisation in terms of the set of practices that studies should focus on. There are two widely cited conceptualisations of professional noticing in the literature. The first came from Van Es and Sherin (2002), who focus on teachers identifying what is important about a classroom situation and making connections to principles of teaching and learning. The second is based on the work by Jacobs, Lamb, and Phillip (2010) who consider teacher noticing as a set of three interrelated skills including “attending to children’s strategies, interpreting children’s understandings, and deciding how to respond on the basis of children’s understandings” (p. 171).

Due to the varied conceptualisations of the nature and dimensions of teacher professional noticing, a diverse range of methodologies has been developed over the last 10 years to reflect on a particular conception of professional noticing. In general, videos and classroom artefacts have been used widely as valuable catalysts for honing teachers’ expertise in noticing, based on evidence of classroom artefacts (Goldsmith & Seago, 2013; Sherin, Linsenmeier, & Van Es, 2009; Sherin, Russ, & Colestock, 2011; Widjaja & Dolk, 2015). In the following sections, we review some of the common video-based approaches to studying teacher professional noticing in the literature. We then discuss some of the ongoing methodological challenges faced by researchers in their attempts to understand how and what teachers notice.
**Video-based instruments for capturing professional noticing in classrooms**

Underlying the video-based approaches to studying professional noticing is the assumption that what was noticed by human eyes can be captured through camera lenses. In studies of teacher professional noticing, a typical approach to capturing classroom interactions involves a cameraman or a researcher standing behind the camera at the back of classroom (Sherin et al., 2008). Alternatively, teachers self-recorded a lesson with digital cameras at the back of the room using a “surveillance-type method for video recording” (Fadde & Rich, 2010, p. 6). Both approaches allow for the capturing of classroom activities, including teacher actions in the classroom. However, these approaches do not represent the views of the classroom as ‘seen’ by the teacher, given the video footage is taken from a different angle than that of the teacher’s perspective.

Sherin et al. (2008) employed Camweare 100, featuring ‘after-the-fact’ technology, which allows one to capture the previous 30 seconds. They warned about the fundamental differences between human noticing and video capturing and challenged the assumption that what was captured on cameras is equivalent to what was seen (and heard) by the teacher in the classroom. In this chapter, we argue that the rectangular framing of a camera lens is quite different from humans’ stereoscopical vision. Hence, what was not captured by the camera could be equally important in understanding teacher professional noticing. Teachers constantly need to be aware of what is happening across the classroom both visually and aurally and these may not be captured by cameras. Furthermore, it is yet to be determined empirically the extent to which the act of video recording might have interrupted the flow of teaching and thus alter the very nature of the teaching practice under study. If such interruption is an inevitable part of the research process, how do the data generated from such a process inform and deepen our understanding of teacher professional noticing in the classroom?

**Video-stimulated interview to elicit teacher professional noticing**

A large number of studies on professional noticing utilised instances of videoed episodes as ways to stimulate or elicit teacher professional noticing. Often, these were conducted in the context of professional development workshops called ‘video clubs’ in which teachers gather together to watch and discuss particular cases of videos of
lessons from their own classes. The benefits of video cases for stimulating teacher reflection and learning are widely acknowledged in research (Lefstein & Snell, 2011; Van Es & Sherin, 2002; Males, 2017). Video technology affords ‘slowing down’ to allow for explicit noticing of particular aspects of fast-paced classroom teaching events (Sherin & Van Es, 2005; Van Es & Sherin, 2002), and the repeated viewing with different foci can potentially foster productive professional discussion amongst teachers (Borko et al., 2008). The slowing down effect of video allows for the dissonance between what the teacher remembered and what they saw on video through analysis (Rosaen et al., 2008; Tripp & Rich, 2012). Indeed, as Roth (2014) claimed, video can change our perspective and allow us to see ourselves in situations as others have seen us and therefore, objectify teaching practices and create opportunities to examine one’s own practices from a distance.

Research indicates that participation in video clubs supported teachers to develop teacher professional noticing by shifting the attention from pedagogy and classroom management towards analysis and interpretation of students’ thinking and reasoning (Van Es & Sherin, 2008; Sherin & Russ, 2014). In some cases, eye tracking devices were used to capture what the teachers paid attention to when watching classroom video scenarios (Wolff, Jarodzka, Van den Bogert, & Boshuizen, 2016). Recent attempts at measuring professional noticing using standardised approaches have included categorising instances of teacher noticing and documenting changes to the frequency of instances using a particular framework (e.g. Van Es & Sherin, 2002; 2008). Other approaches to measuring professional noticing included the use of point or ranking systems to score noticing (e.g. Jacobs et al., 2010), or teachers’ responses to video-anchored Likert-type prompts (Strurmer & Seidel, 2017). According to Tripp and Rich (2012), most studies reported that video reflection allows teachers to:

- identify gaps between their beliefs about good teaching and their actual teaching practice;
- articulate their tacit assumptions and purposes about teaching and learning;
- notice things about their teaching that they did not remember;
- focus their reflections on multiple aspects of classroom teaching; and
- assess the strengths and weaknesses of their teaching.
Research on teacher professional noticing and professional learning reveals that teachers’ noticing can be made more productive when teachers engage with colleagues in collaborative inquiry and collegial collaboration (Choy, 2013; Nickerson & Moriarty, 2005). Research has also been conducted in which teachers had an opportunity to view their colleagues’ teaching video, which showed that teachers seemed to benefit equally from viewing video of their own classrooms and video of their colleagues’ classrooms (Sherin & Han, 2004). However, research seems to be inconclusive as to whether teachers should view and reflect on video individually (Yerrick, Ross, & Molebash, 2005) or engage in discussion with colleagues (Borko et al., 2008; Sherin & Han, 2004). Most studies have focused on either individual viewing or group viewing. The study reported in this chapter employed both methods in a single study to triangulate the data generated from different social situations. Such triangulation allows for comparisons of what was noticed in each social context (individual, versus group viewing) and for investigating the impact of different social contexts on professional noticing that takes place.

Methodological challenges in understanding the complexity of teacher professional noticing

Teacher professional noticing is widely recognised as socially situated in the instructional settings (Jacobs, 2017) and heavily dependent on “teachers’ orientations (including beliefs) and resources (including knowledge)” (Schoenfeld, 2011, p. 231). Furthermore, understanding the complexity of teacher noticing is challenging because the dynamic relationships between various activities involved in teacher noticing are not obvious (Scheiner, 2016). Video-based approaches have the potential for us to get closer to the in-situ practices of noticing by teachers and to unpack and understand its complexity.

As discussed earlier, the use of video as a tool in research studies of teacher noticing is often taken to be a ‘window’ into the classroom or a ‘lens’ that reflects particular aspects of the classroom reality (Haw & Hadfield, 2011; Clarke & Chan, Chapter 1 in this book). However, equating what was noticed by the teachers (or the researcher) with what was captured on the camera may not be adequate as it ignores the human dimensions of noticing and the reasoning behind the noticing of a particular event.
Indeed, as we will show, what was noticed from watching video records of classrooms might be quite different from teachers’ in-the-moment professional noticing in their classrooms (Sherin et al., 2008).

**Research design**

**Methodological considerations**

This project employs a case study methodology (Miles & Huberman, 1994) that combines: video recording of science and mathematics lessons by the teachers, post-lesson individual viewing and reflection on their own lessons as well as their colleagues’ lessons, and collaborative discussion of selected video segments with the researchers (see Figure 5.1).

![Figure 5.1 The research design processes](image)

The researchers made a deliberate decision to be absent from the classrooms with the intention to minimise intrusion and to allow the teachers to have full control of *when* and *what* to film. The teachers were given the opportunity to select salient moments of the video-recorded lessons for discussion during the interviews with the researchers. This is in contrast with studies in which the researcher controls what video teachers watch and discuss in the interview (Clarke, 2001; Santagata, Zannoni, & Stigler, 2007; Van Es & Sherin, 2008). Such a design was intended to challenge the traditional
hierarchical relationship between the researcher and the research participants (see, for example, Lefstein & Snell, 2011) so that the teacher participants could be empowered and actively engaged in the research process as co-researchers.

Initial training of the teachers prior to handing over the video-recording equipment was provided by the researchers to make sure that they were confident and comfortable in the use of the equipment to film their own lessons. All teachers were encouraged to trial the video-recording equipment before the research recording took place so that the students were desensitised (as much as possible) to the presence of the cameras in the classroom.

Research setting and participants

The research was conducted in two Australian primary schools in the state of Victoria, one in Melbourne and one in Geelong. Five teachers participated in the study, three teachers from the school in Melbourne and two teachers from the school in Geelong (see Table 5.1). It is worth noting that except for one teacher in Melbourne who was employed as a science specialist, the other four teachers were generalist teachers teaching across all subject areas.

Table 5.1 List of participating teachers (pseudonyms)

<table>
<thead>
<tr>
<th>School location</th>
<th>Teacher</th>
<th>Year level</th>
<th>Lesson(s) filmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melbourne</td>
<td>Gary</td>
<td>5 – Science specialist</td>
<td>Science</td>
</tr>
<tr>
<td></td>
<td>Fiona</td>
<td>5 – Mathematics teacher</td>
<td>Mathematics</td>
</tr>
<tr>
<td></td>
<td>Carol</td>
<td>5 – Mathematics teacher</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Geelong</td>
<td>Lily</td>
<td>1/2 Teacher</td>
<td>Mathematics and science</td>
</tr>
<tr>
<td></td>
<td>Melinda</td>
<td>5/6 Teacher</td>
<td>Mathematics and science</td>
</tr>
</tbody>
</table>

There were some variations in the enactment of the research design (see Figure 5.1) in the two schools. As the science specialist in the Melbourne school only taught science and music, the three participating teachers in that school only recorded one lesson each (either mathematics or science). All five teachers video recorded one mathematics and one science lesson using a wearable GoPro camera and an iPad mounted onto a Swivl (a robotic mount that can track and follow the movement of the teacher). The teachers decided for themselves whether to wear the GoPro cameras on their head or chest. The combination of a wearable GoPro camera and an iPad camera provided complementary viewpoints of the same classroom: one from the teacher’s view, and the other from the back of the classroom following the teacher around the room. Once the lessons were recorded, the teachers were asked to share their lesson videos with each other and to
individually comment on the videos of their lesson as well as the videos of their colleague’s lesson. They decided which footage to view: the classroom-view footage, the teacher-view footage, or both. A reflection worksheet was used to capture moments that teachers identified as salient, a description of those salient moments and reasons for why a particular moment was chosen by the teachers. Figure 5.2 shows an example of the reflection sheet completed by one teacher. Note that the teachers were given an example of what constitutes a salient moment and the reason for the choice.

<table>
<thead>
<tr>
<th>Time of Salient Moment</th>
<th>Description of moment</th>
<th>Reason(s) for Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>From (hh:mm:ss) To (hh:mm:ss)</td>
<td>What occurred in this moment?</td>
<td>Why did you mark this moment as salient? How does this help you to think about your students’ learning and/or your teaching?</td>
</tr>
<tr>
<td>00:27 3.55</td>
<td>Students are sitting on the floor listening to the teacher explain the task for the lesson. Maths Games Clear strategy focus Try something different to develop your skills Modelling of different strategies</td>
<td>There is a really clear focus from the beginning of the lesson and the teaching is very explicit. The students know exactly what is expected of them and they know what skills they will be building throughout the games. The articulation and descriptions are really clear, while also using proper vocabulary. This will help the students develop skills in expressing and describing their strategies.</td>
</tr>
<tr>
<td>4:00 12:05</td>
<td>Students begin playing Zim Zam and the teacher is using questioning to encourage the students to talk about their solutions.</td>
<td>The teacher is encouraging students to talk about the process they used to find the answer and uses this as a focus rather than only the answer. Students articulate ‘how’ they knew the answer and this is repeated for the whole grade. This is really important modelling for other students to see and also increase the student’s capacity to discuss their learning. It is also really important and notable how the teacher asks if students have done it a different way. This allows students to develop a broad view of maths strategies and that not one strategy works for everyone. This is also great ongoing assessment and may provide information to the teacher for future learning and point of need.</td>
</tr>
</tbody>
</table>

Figure 5.2 An example of the reflection sheet

Each salient moment identified by the teachers was coded on a timeline of the video for the lesson on Studiocode software for analysis. This software offers a platform to enable complex collections of interrelated clips based on different video sources (the GoPro camera and iPad). These coded salient moments and the reflection sheets were used as stimulus during the collaborative viewing with the researchers.

In the Melbourne school, the teachers viewed their own lesson individually in their own time. The viewing of their colleagues’ lesson was undertaken with the presence of the researchers due to practical constraints. All three teachers came to share their general reflections on the selected salient moments and feedback on the whole research process during the school recess time. This limited time for collaborative discussion might have had some impact on the depth of the teachers’ joint reflection. Viewing and
discussing the salient moments in the presence of the researchers might have influenced the nature of teacher professional noticing. Nevertheless, we argue that research design needs to accommodate practical constraints within the school context and critically examine the consequences of such changes on the research findings. Figure 5.3 shows an example of salient moments coded on a timeline for the science lesson. Each line represents an individual teacher’s selection of salient moments. The length of each varied according to the teacher’s judgement.

Figure 5.3 Screenshot of salient moments in the science lesson identified by three teachers

**Methodological challenges in examining teacher professional noticing**

While we attempted to separate ourselves from the research phenomena, we found ourselves inevitably entangled in the research process by which the data were generated. As a consequence, we decided to take a reflective approach to understanding the research process and the data generated (Pink, 2001; DuFon, 2002). Such a reflective approach allows us to consider our roles in the research process and the significant role played by the video cameras in both capturing and re-representing the socially situated activities.

**Technological and methodological challenges**

One of the challenges inherent in video research is that of the influence of new video technology both on the students and the teachers (DuFon, 2002). While the intention of
giving the control of cameras to the teachers was to minimise the intrusion caused by
the presence of researchers in the classroom (Bogdan & Biklen, 1998), the presence of
cameras in the classroom inevitably impacted on the ‘naturalistic’ practice of the
classroom.

Goffman (1959) describes how social interaction can be compared to theatre, with
each person playing a role. All teaching, in this sense, is a performance that is designed
to engage with an audience (students) for a particular purpose (learning goals). The
degree to which such performance is influenced by the cameras is difficult to ascertain.
Similarly, the way in which cameras influence students can only be inferred. An
example from Gary’s science lesson was when one of the female students could be seen
manoeuvring herself so that she appeared on the iPad Swivl. She then took a quick look
to check if she could still be seen and put her hand up to answer a question that had not
been asked because the teacher was in the middle of explaining what the class would
be doing. This indicated the potential influence of the camera on at least some students’
behaviours in class. It can be inferred (by her prior attention to the camera) that she
intended to increase her visibility on camera.

Teachers’ lack of familiarity with the camera did influence the classroom
interactions. For instance, at the very beginning of the lesson, Gary forgot to turn on
the camera, as evident in the following quote:

Guys, we’ll just reintroduce it [learning intentions] for the sake of the camera. So
the focus again, to explore the impact surface area has on evaporation. [Gary]

The influence of cameras on student behaviours was also reported in Lily’s reflection
of her science lesson during the interview. She noticed that “it [the discussion] took a
long time – it doesn’t usually take that long as it did in the video and the kids were
really quiet”. Lily could not pinpoint if her students’ unusual level of engagement in
the lesson was due to “whether it was hot or the camera” or “maybe because we had
bugs as opposed to word cards”. This prompted Lily to think about ways of improving
her students’ engagement, such as her choice of representations and the way the camera
was placed in the classroom. The viewing of video provided a catalyst for Lily to notice
the unusual level of engagement leading to her reflecting on possible reasons for her
students’ lack of engagement and ascertaining plans to address this issue.
Melinda also mentioned some effect of the presence of the camera on student performance. But rather than being quiet as is the case for the students in Lily’s classroom, the students in Melinda’s classroom were quite vocal and Melinda reported in her interview that “they [the students] were trying really hard – they knew the cameras were on”. Another example of this was when Gary thought that the Go-Pro camera was not working (even though it was still recording) and he put it aside during the lesson and said: “I’ll go without the Go-Pro”. After which he then focused on a student’s response. A question that arises is how different would the lesson have been without the intrusion of cameras? From the point of view of the students in Gary’s class, the influence of the iPad Swivl was evident throughout the lesson because students could see themselves on the screen and were looking at this regularly. This problem could have partially resolved if the camera had been reversed so that only the back of the device could be seen.

If validity of data is taken to be how close the camera captures the ‘naturalist’ classroom practice and teacher noticing, then the data generated from this study was limited by teachers’ lack of familiarity with videoing their own classes and the novelty (to both students and teachers) of being videoed in class. The following quote from Carol captures the dilemma:

I actually think the GoPro and all that sort of stuff was more distracting for the children and the set-up, observing us with it all, putting it on, all that and it seems more of a performance than if somebody was just to stand discreetly in the back and film it because I think many would get a far more natural response from the children than using the Go-pro and because the children and the Go-pro they’re fascinated with everything about it. [Carol]

Methodological tensions in navigating the logistical and substantive aspects relating to using self-capture video were highlighted. The deliberate decision by the researchers to be absent from the classrooms to minimise intrusion into the classroom created extra burdens for teachers to deal with the logistics of video recording, as was noted by Carol above. However, this view was not shared by Fiona, who commented that the impact of the camera was “only because it’s new” and it might not be present “if you were to use the GoPro every single day”.

The nature of professional noticing captured

Video has the potential to facilitate the processes of researchers and teachers unpacking what the teachers noticed as salient moments and their reasons for selecting them. The following three examples illustrate the complex nature of noticing. These include variations of the salient moments selected by teachers and the different reasons for their selections.

For example, teachers from the Melbourne school discussed the effectiveness of the use of an additional stimulus for explaining the variance of surface area for leaves (Figure 5.4). In this science lesson, the teacher explored the impact surface area has on evaporation using images of leaves. During the interview, the three teachers from the Melbourne school watched the science lesson individually in the presence of the researchers and identified some salient moments. One of the common salient moments identified by all three teachers concerned the comparison of the surface area of leaves from oak trees and acacias (Figure 5.4). The science teacher, Gary, indicated his reason: “Once I realised that students’ background knowledge wasn’t enough I gave a second stimulus. This demonstrated that I was able to consolidate students’ understanding by being explicit” [Reflection sheet]. The second stimulus that Gary provided involved the use of colourful images that he sourced to highlight adaptations in leaves due to the environment, such as the desert or rain forest. His aim was to enhance the existing Primary Connection unit ‘Desert Survivors, Year 5’ (Australian Academy of Science, 2012). Similarly, Carol selected the use of a visual stimulus but for a different reason.

… rather than just his questioning he is actually going to use another form of getting a message across; getting them to watch something to support what he’s trying to get from them so that visual stimulation – some children are very visual… [Interview].

By contrast, Fiona focused on Gary’s questioning to elicit students’ reasoning.

… because it’s an area where he’s trying to prompt them to come and think about, be creative about their answers and think about what they already know and I think that persistence in trying to get them to come up with some reasoning is a good moment. [Interview].
Another salient moment that was selected by Gary and Fiona regarded the need to modify the amount of liquid due to the different type of paper towel used during the science experiment. Gary commented that he identified this salient moment as he recognised the problem during the lesson and the need to “modify the lesson on the run to help ensure a more authentic outcome” [Reflection sheet]. Fiona recognised the moment as salient but thought that if time allowed, Gary could have used this as a teachable moment. She pointed out “It’s a learning moment. I guess with time …, you can’t always elaborate oh that’s a learning moment because you’re so constricted on time” [Interview].

Recognising common pedagogical strategies used across science and mathematics can be facilitated by watching videos of teachers’ own and their colleagues’ lessons. For instance, Gary and Carol recognised the use of the ‘fishbowl strategy’ in both mathematics and science lessons. The positive change in attitude of a particular student was noticed by Gary through observing Carol’s praise of this student during her mathematics lesson. This highlights an inextricable link between perception and conception in teacher noticing, as pointed out by Towers and Davis (2002): “what we notice is completely framed by what we know” (p. 318).

One of the boys in this lesson, it’s interesting … he is usually reluctant to participate in a verbal manner. I was quite surprised when this boy, (Tyson) started answering questions and giving ideas. [Gary]

Similarly, the value of viewing colleagues’ work is noted by Fiona.
I think it’s always good to review what you have done and there are things that you can pick up from there, you just think I wish I had done this or I wish I had done that, could’ve done this better, could’ve included this; so I think that sort of is good and also to see your peers or colleague because you can pick up things from them … and learn from it too, so that can be a learning experience on both counts. [Fiona]

The opportunities to view the video records of teaching by themselves and their colleagues allowed teachers to notice commonalities in their practice, contingent moments in their teaching, and changes in students’ attitudes and engagement. Furthermore, the video served as a stimulus for teachers to reflect on their practice and recognise the importance of learning from each other’s practice.

**Inability to capture peripheral vision**

A limitation of video capture is that of missing salient moments outside the camera’s range and is encapsulated in Carol’s comment. While this study uses two cameras – one worn by the teacher on their chest or head, another one to capture a whole-class view – the camera lens only captures a partial reality of the classroom and hence a partial account of teachers’ professional noticing. This resonates with the points raised by Hall (2000) who claims that video recording provides ‘objective’ or ‘realistic’ records of human action (p. 658).

… and I noticed even in the GoPro there was lots of information and because I was there I remember and I was aware of what some of the children were asking or doing, but wouldn’t necessarily pick it up on the video and they were very important parts of it and also the aspect of peripheral vision and other things that you see … [Carol]

The differences between what was captured on video and what was noticed by the teachers in the classroom calls into question any attempt to capture the complexity of teacher noticing in the moment. Teachers constantly attended to things occurring across the room, which may or may not be captured through the flat and rectangular lens of a video camera. What is missing from what was captured on camera is the ability to engage with the environment, to move, to turn one’s head or even just the eyes, to use peripheral vision to see stereoscopically (Dant, 2004). Glances between people and
objects are often crucial for other participants to make sense of what is going on (e.g., Goodwin, 1994). Additionally, experienced teachers often pick up sounds from the other side of the room, as reported by Carol. By contrast, what was captured on video often contains more information compared with what was remembered by the teacher due to the ‘slow down’ effect of video (Sherin & Russ, 2004; Van Es & Sherin, 2002).

**Concluding remarks**

At the start of the chapter, we asked ‘to what extent does the video-based research methodology allow us to unpack and draw inferences about primary school teachers’ professional noticing?’ What we reported in this chapter provides some preliminary responses to this question. The video-based approach employed in our study allowed us to gain some understanding of the complexity of teachers’ professional noticing, demonstrated through the differences in the selected moments in the same lesson by different teachers, and the variety of reasons provided for selecting the same classroom event. As we tried to unpack and understand these differences, we found that teachers’ noticing was highly situated in their own individual practices, reflecting their thinking, beliefs, likes and dislikes, epistemic attention, actions both enacted and suppressed, and of course, their knowledge (Mason, 2016; Schoenfeld, 2011).

We questioned the extent to which the camera lens could capture what might be seen through human eyes and the problematic analogy of human eyes and camera lens underpinning a number of research studies of professional noticing. First, the rectangular framing of a camera lens ‘misrepresents’ what was seen by participants due to the human’s stereoscopical vision rather than the ‘flat’ vision captured on camera. Second, what was ‘off camera’ is equally important to make sense of what is going on in the classroom as teachers constantly attend to what is at the periphery and pick up sounds that may or may not be captured by microphones attached to the cameras.

A further point made in this chapter is the boundary between performance and documentary in video-based research studies aimed at understanding teacher practices in general and teacher professional noticing in particular. The boundary between performance and documentary becomes blurry in video research, as designed and reported herein. While the research was set up to minimise intrusion, evidence indicated some students were nevertheless conscious of being filmed. Teaching itself can be
regarded as a performance with students as the primary audience. This is amplified when teaching becomes the object of research documented through the use of video, which was then subject for further noticing by the teachers and researchers. In this sense, the intrusiveness of video research in this study is inevitable. But the question remains: can we truly minimise intrusion to the research setting in video research or in any research? Nonetheless, using a reflective approach in analysing the data generated provided us with some insight into the nature of professional noticing and how it might change from one research context to another, and over the course of the research project.

We attempted to ensure the validity of data interpretation through triangulating different data sources, as suggested by Lesh and Lehrer (2000). In this study, we used video data complemented by teacher reflection and video-stimulated interview data. We acknowledge the challenges in distinguishing what was noticed in the moment in the classroom from what was noticed after the event due to the fleeting and dynamic nature of participants’ noticing. Further research in this area is needed to effectively differentiate the different types of noticing.

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