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Pre-service Teacher Reflection and Feedback Using an Online Video Platform During Professional Experience

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Abstract: This paper presents the results of a pilot study in which 11 triads comprising a pre-service teacher, a supervising teacher and a university supervisor used a video platform for pre-service teacher self-reflection and for the provision of feedback. Pre-service teachers made video recordings of one lesson each week during a four-week professional experience placement. They annotated the videos using time-stamped comments and shared them with their supervisors who added comments to provide feedback. The annotations were investigated through questionnaires and interviews that were analysed for their depth of reflection and participants' views about the video reflection process. Results indicate that the video process only marginally supported the provision of targeted feedback and pre-service teacher reflection. Factors which contributed to these outcomes are discussed.

Introduction

Initial teacher education programs are focused on providing pre-service teachers with authentic professional experiences that help them to integrate theory and practice (Zeichner, 2010). Studies of pre-service teachers during professional experience provide an opportunity to investigate how their reflective practice can be supported (Stenberg, Rajala, & Hilppo, 2016). This paper presents the results of a pilot study in which pre-service teachers used their mobile phones to make video recordings of their lessons during professional experience. They annotated the videos using time-stamped comments and shared them with their supervisors who provided feedback by responding to the pre-service teachers' reflections and adding further comments of their own. The annotations were investigated through questionnaires and interviews that were analysed for their depth of reflection and participants' views about the video reflection process.

Reflection in Teacher Education

Reflection is an important aspect of teacher professional development and analysis of practice. According to Schön (1983), 'reflection-in-action' occurs as teachers respond to events as they arise during a lesson. It is an unconscious reaction to an event based on prior experience which is triggered by an unexpected event that provokes the practitioner to examine its causes. 'Reflection-on-action' occurs after the lesson and enables the practitioner to review and interpret events. It is retrospective and supports a process of reviewing and interpreting the event so that one can develop a plan for future action. Learning to reflect on practice is regarded as an important element in teacher education programs (Alger, 2006).

Santagata and Guarino (2011) identify three fundamental skills for pre-service teachers to reflect on and learn from teaching. These are the ability to notice important elements of instruction, the capacity to consider these elements in an integrated way, and the capability to propose alternative instructional strategies. When pre-service teachers have regular opportunities during professional experience to reflect on their classroom practice, they are better able to problematise teaching and more willing to take pedagogical risks (Davis, Petish, & Smithey, 2006).

Reflection allows pre-service teachers to scrutinise their lessons more closely (Levin, Hammer, & Coffey, 2009), to connect theory and practice (Ward & McCotter, 2004), and become more aware of the assumptions on which their teaching decisions are based (Yost, Sentner, & Forlenza-Bailey, 2000). Herbst and Chazan (2003) suggest that two important qualities of teacher reflection are the ability to consider causes and suggest alternatives, and the capacity to inquire or speculate on reasons or consequences of actions. However, pre-service teachers may not possess either the observation skills or the pedagogical content knowledge to undertake a refined analysis of learning and teaching (Barnhart & Van Es, 2015). Instead, they tend to produce what Davis (2006) has referred to as ‘unproductive reflection’ which simply describes the lesson (Chamoso & Cáceres, 2009). Often, these outcomes occur when pre-service teachers reflect in isolation without any guidance or support (Delandshere & Arens, 2003).

Van Es and Sherin (2002) describe the process of reflecting on one’s teaching practice. In the first instance, teachers must learn to identify important aspects of a teaching situation and provide an account of them (describing). Then they must apply knowledge of the context to analyse the event (evaluating). Finally, teachers link the specific experience and their thinking about it to more general principles about learning and teaching (interpreting). Reflecting on classroom events is enhanced when teachers can imagine alternatives that may lead to changes in future actions (Jacobs, Lamb, & Philipp, 2010).

Using Video for Reflection and the Provision of Feedback

Video has been used to support reflection in initial teacher education programs (e.g., Watters, Diezmann, & Dao, 2018). Video allows pre-service teachers to revisit parts of the lesson, allowing for reflection-on-action and a more thoughtful consideration of their teaching (van Es & Sherin, 2002). Problems of practice can be considered from a variety of perspectives, such as student learning (Rosaen, Lundeburg, Cooper, Fritzen, & Terpstra, 2008), teacher actions, and the content of the lesson (Hiebert, Gallimore, & Stigler, 2002). Video allows one to review salient features multiple times (Ulusoy, 2020) and focus on different aspects of the lesson so that patterns of practice can emerge (Tripp & Rich, 2012). For example, Chung and van Es (2014) reported that the use of video helped pre-service teachers to analyse their teaching practice and make sense of learning and teaching.

Video allows a focus on individual students or interactions among groups of students to shift pre-service teachers’ attention onto student learning (van Es, Tunney, Goldsmith, & Seago, 2014). For instance, video case studies have been used to expose pre-service teachers to reform-oriented classroom practices which they may not have observed during their professional experience (van Es & Sherin 2006). Video of pre-service teachers’ own lessons can promote self-reflection (Santagata & Guarino, 2011) because the videos are seen as authentic representations of practice (Gold & Holodyski, 2017). However, simply viewing a video of a lesson does not automatically encourage pre-service teachers’ reflective practice or pedagogical content knowledge (Brouwer, Besselink, & Oosterheert, 2017).

Video can be used for peer and expert feedback and the combination of both has been found to promote pre-service teacher reflection (Weber, Gold, Prilop, & Kleinknecht, 2018). Kleinknecht and Gröschner (2016) used a video reflection system similar to the one used in the present study. They developed a 'video feedback cycle' of self-reflection, peer feedback, expert feedback from teacher educators followed by a second self-reflection "aimed at a feedback balance including to what extent comments as alternatives were regarded as helpful" (p. 48). They compared the reflections of pre-service teachers engaged in the video process with a control group who used journal writing and found that video feedback from peers and academics helped expand pre-service teachers' ability for self-reflection. Video feedback from others also provided more balanced comments than pre-service teachers' self-reflections, which tended to be rather critical appraisals of their lessons.

Supervisors can use video recordings to notice aspects of the class which they might have missed or may not have remembered after observing the lesson (Rich & Hannafin, 2009). They can tag segments of the video containing critical incidents (McFadden, Ellis, Anwar, & Roehrig, 2014) to support pre-service teacher reflection. However, while interaction with knowledgeable others is often regarded as a necessary precondition for the development of pre-service teachers' reflective practice (Gelfuso & Dennis, 2014), the provision of such 'guided reflection' (Husu, Toom, & Patrikainen, 2008) is not sufficient of itself to ensure that reflection will occur. When teacher educators simply state the issue or identify the critical incident for pre-service teachers the problem of practice is unlikely to be made visible for them nor will this help them to see the problem in a variety of ways. Rather, teacher educators should pose questions, model reflective thinking, and encourage and affirm pre-service teachers' own reflective thinking (Jones & Ryan, 2014).

Aims and Research Questions

The present study investigated whether the use of time-stamped video annotations can support pre-service teachers' reflection and enhance the provision of feedback from supervisors during professional experience. The research questions that guided the study were:

- What are the differences in depth of reflection for pre-service teachers, supervising teachers and university supervisors?
- How do pre-service teachers, supervising teachers and university supervisors regard the video process as a tool for self-reflection and the provision of feedback?

Method

Context and Participants

The participants for the study were 11 triads across five schools, each comprised of a pre-service teacher (seven primary and four secondary; nine female and two male), a supervising teacher (n=11) and a university supervisor (n=3; university supervisors were allocated to more than one triad). The pre-service teachers were all from one university in metropolitan Sydney. They were in the third or final year of a four-year combined Bachelor of Arts and Bachelor of Education degree program, either for generalist primary teaching or secondary teaching of specific teaching subjects (History, n=2; English, n=1; Mathematics, n=1). Six pre-service teachers were undertaking their first placement and five were undertaking their final placement, having completed 20 days of professional experience in

another school in the previous year. The supervising teachers had at least 10 years of teaching experience and had previously supervised pre-service teachers during professional experience. The university supervisors were retired teachers who were experienced supervisors. Ethics approval was granted by the host university and the pre-service teachers and university supervisors volunteered to participate in the study following email announcements about the project. The supervising teachers of the participating pre-service teachers were then emailed and invited to join the study. Not all agreed: some schools did not allow video-recording of lessons, so only pre-service teachers and university supervisors who had been matched to supervising teacher participants in a school where video was permitted were included for the study.

A two-hour Information Session for pre-service teachers was held prior to the start of the placement to explain the process of recording, annotating, uploading and sharing video excerpts. The university supervisors had been trained previously and the supervising teachers were shown how to use the video system by their pre-service teacher. Following Danielowich (2014), no suggestions were given about how to reflect or provide feedback so participants would not feel obliged to produce what they believed were the ‘right’ responses. During each week of the four-week placement, pre-service teachers identified a “puzzle of practice” or aspect of their classroom practice on which they wanted to focus. They used a plastic frame to grip their mobile phone to a tripod and video-record their lessons. Some pre-service teachers recorded most of the lesson and later selected an excerpt of approximately five to eight minutes, while others activated the phone camera to capture a passage of interest (e.g., introducing the lesson, transitioning between activities, conducting whole class discussions, etc.). They uploaded the recording to a password protected website where they could view the video and annotate it with time-stamped comments. The supervisors received an automated email alert that the annotated video was ready to view. They read the pre-service teacher’s annotations and add their comments. Figure 1 shows a screenshot of an annotated video.

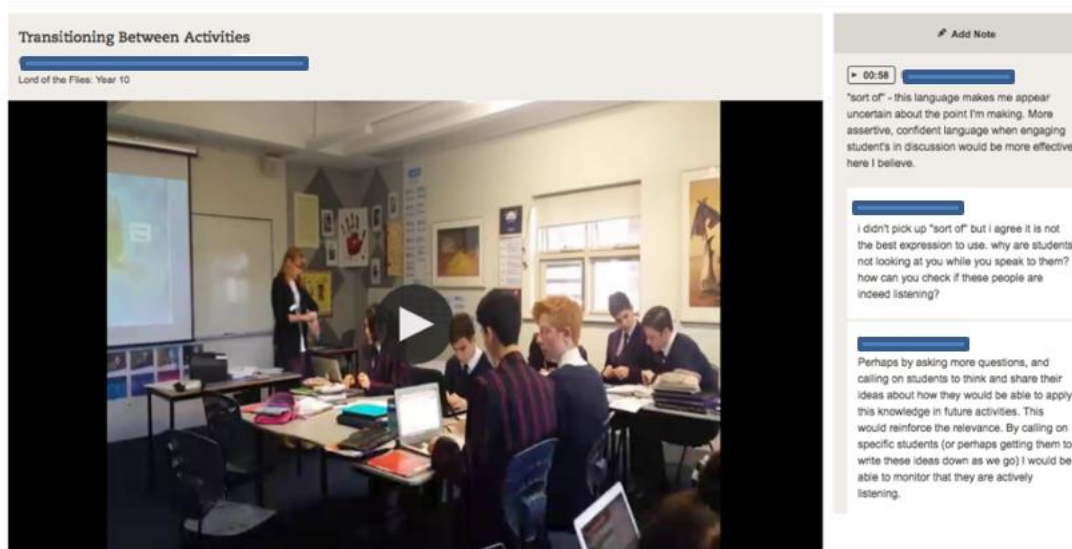


Figure 1: Screenshot Showing an Annotated Video

Data Collection and Analysis

There were 44 video clips (one video per week during the four-week teaching block for each of the 11 pre-service teachers) incorporating 1,228 annotations available for analysis. Annotations were coded using the four levels of reflection developed by Lane, McMaster, Adnum, and Cavanagh (2014) to categorise the depth of reflection in pre-service teachers' reflective writing: D1–Descriptive, D2–Evaluative, R1–Reflective and R2–Imaginative. Descriptive responses simply retell or describe events which have been noticed in the classroom. Evaluative responses take an additional step to make a judgement about what has been observed. Reflective responses analyse what is noteworthy about a particular lesson event and consider why things turned out as they did; these comments are often characterised by the use of “as”, “since” or “because”. Imaginative responses interpret classroom scenarios and make suggestions about how lessons could be taught differently and improved; these comments typically include “could have”, “should have”, or “would have”. The levels are described with examples from the present study in Table 1.

Level	Example
D1 (Descriptive)	You reminded the class about your expectations of them in the lesson.
D2 (Evaluative)	Your interaction with the students in this lesson was very good.
R1 (Reflective)	The class was aware of the lesson goals because I stated at the start that we were focusing on adjectives and punctuation.
R2 (Imaginative)	I should have figured out how to use the technology before the lesson.

Table 1 Examples for the Depth of Reflection

The author and a research assistant met to discuss the four levels and jointly code one video. Each annotation was assigned a single code and if the annotation included evidence at more than one level, the higher-level code was applied. For example, an annotation which described an event and included some analysis would be coded as R1-Reflective. Next, the author and the research assistant independently coded 74 annotations from four randomly selected videos and agreed in 61 instances (82%). After discussing the discrepancies and agreeing on the coding of the four videos, a further 53 annotations from one other video were independently coded, with agreement in 48 instances (91%). Discrepancies were discussed and the remaining coding was then completed by the research assistant.

Gelfuso and Dennis (2014) reported that most studies of pre-service teacher reflection tend to focus on artefacts “left behind after the process of reflection has occurred ... As a result, it seems little is understood about the facilitation of the process of reflection” (p. 10). The present study used a written questionnaire and a series of interviews to investigate participants' views about the video reflection process and whether it had assisted the development of pre-service teachers' reflective practice. Although the questions varied slightly for pre-service teachers, supervising teachers and university supervisors, the aim was to gather information from all participants about how they had used the video reflection process and whether they felt it had been useful as a means of reflecting on practice. All 25 participants (11 pre-service teachers, 11 supervising teachers, 3 university supervisors) completed the questionnaire at the end of the four-week placement and in the following two weeks the research assistant conducted the interviews: with the three university supervisors together, with 11 pre-service teachers across four group interviews, and by telephone with a random sample of seven supervising teachers from three participating schools. The interviews were audio-recorded and transcribed and allowed participants to elaborate their questionnaire responses.

Qualitative data from the questionnaires and the interviews were analysed by the author through a process of thematic content analysis known as ‘reflexive iteration’ (Srivasta,

2009), an inductive approach which involves revisiting the data multiple times to identify emerging themes. In doing so, two of the analysis phases outlined by Elo and Kyngas (2008) were employed; namely, preparation and organising. In the preparation phase, the author became familiar with the data by reading through the questionnaires and interview transcripts multiple times. This phase led to a general understanding of participant responses and the creation of ten broad themes (focussed comments, triad sharing, time-stamped, university supervisor visit, multiple views, video limitations, recommendations, student learning focus, specific feedback, university supervisor interactions).

Next, in organising the data, similar themes were combined and categories formed. For example, “university supervisor visit” and “university supervisor interactions” were combined into a category “role of university supervisor”; “multiple views” were collapsed into “triad sharing”; “time-stamped” and “focused comments” were collapsed into “specific feedback”; and “video limitations” were collapsed into “recommendations”. After the next round of reading and coding the categories of “triad sharing” and “role of university supervisor” were found not to be sufficiently distinct and were combined. Hence there were four categories (specific feedback, student learning focus, triad sharing, and recommendations). Data corresponding to each of the categories were arranged in separate files and identified according to their source (pre-service teacher, supervising teacher, or university supervisor). Each category file was closely read and representative quotes identified.

Results

Differences in Depth of Reflection

The first research question about differences in the depth of reflection for pre-service teachers, supervising teachers and university supervisors is addressed in a quantitative analysis of the video annotations. These results are given according to the four levels of reflection (Lane et al., 2014) in Table 2 and for each triad in Table 3. Note that all percentages quoted in this paper are rounded to the nearest whole number.

	D1	D2	R1	R2
Pre-service teachers	189 (45%)	28 (7%)	84 (20%)	124 (29%)
Supervising teachers	53 (26%)	67 (33%)	39 (19%)	47 (23%)
University supervisors	233 (39%)	213 (36%)	64 (11%)	87 (15%)
TOTAL	475 (39%)	308 (25%)	187 (15%)	258 (21%)

Table 2: Annotations Coded for Depth of Reflection

Table 3 shows that one pre-service teacher (Triad 10) and one university supervisor (Triads 9 and 10) contributed a total of 423 annotations, representing 34% of all annotations. These comments were predominantly comprised of a single sentence coded at the level of D1 or D2. If the annotations made by these two participants are removed, the proportion of total annotations contributed by each group becomes more balanced (pre-service teachers 38%, supervising teachers 26%, university supervisors 37%) indicating a more even sharing of contributions across the participant groups. The proportion of annotations at the four levels of reflection also shifts from D1 towards R2. The results with the pre-service teacher (Triad 10) and university supervisor (Triads 9 and 10) removed are shown in Table 4.

	Pre-service teacher	Supervising teacher	University supervisor
Triad 1	25	21	36
Triad 2	16	17	24
Triad 3	21	26	34
Triad 4	26	28	36
Triad 5	62	15	47
Triad 6	29	30	26
Triad 7	40	18	39
Triad 8	46	23	42
Triad 9	19	24	131
Triad 10	123	4	169
Triad 11	18	0	13
TOTAL	425 (35%)	206 (17%)	597 (49%)

Table 3: Annotations by Participant

The data in Table 4 indicate that pre-service teachers' annotations were predominantly at the D1 level (38%) and the R2 (36%). Even so, just over half (55%) of the pre-service teachers' annotations were coded at the higher R1 and R2 levels which compared favourably with their supervisors (42% for supervising teachers and 38% for university supervisors). It is also interesting to note that pre-service teachers' annotations included a relatively low proportion of D2 comments (6%). Supervising teachers and university supervisors made a relatively high proportion of evaluative comments (33% and 32% respectively). There was a relatively low proportion of R2 commentary from supervisors (23% for supervising teachers and 26% for university supervisors).

	D1	D2	R1	R2
Pre-service teachers	117 (38%)	18 (6%)	57 (19%)	110 (36%)
Supervising teachers	53 (26%)	67 (33%)	39 (19%)	47 (23%)
University supervisors	90 (30%)	95 (32%)	36 (12%)	76 (26%)
TOTAL	260 (32%)	180 (22%)	132 (16%)	233 (39%)

Table 4: Annotations Coded According to the Four Levels of Reflection without Including those for the Outlier Participants

Reflection and Feedback

The results from the qualitative thematic content analysis of the questionnaires and interviews address the second research question about the views of pre-service teachers, supervising teachers and university supervisors regarding the video process as a tool for self-reflection and the provision of feedback. These results are reported in three sections which incorporate the first three categories from the data analysis, with the participants' recommendations incorporated into each theme as appropriate.

Providing Specific Feedback

A feature of the video reflection process was the ability to make time-stamped comments related to specific instances from the lesson. Participants noted that video feedback "was quite short, it forced you to get to the point and be concise and really say things in a succinct manner" (supervising teacher) and this was "a lot more concise than I've previously

been used to” (supervising teacher). Some of the fourth-year pre-service teachers noted differences from feedback received on earlier placements: “This type of feedback is a lot more fine-grained and thorough than from lessons on all previous pracs” (pre-service teacher). The time-stamped video annotations “encourage a very precise observation backed up by video evidence of how students or teacher respond to strategies used in class” (university supervisor). In contrast, participants noted that video feedback was more precise than that given immediately after the lesson because “the delayed [video] feedback allowed me more time to consider alternatives to issues noticed in the lesson and provide better feedback” (supervising teacher).

Clicking on a video comment automatically cued the video to that specific moment from the lesson which “makes it really easy to immediately see how that particular annotation relates to that point in the lesson” (supervising teacher). The cuing facility of the video platform made the feedback process more efficient since “It’s much better than having to play the whole video and then just writing annotations here and there” (university supervisor).

Supervisors reported that the specific nature of the video feedback made it easy for pre-service teachers to understand the points being made, since “the comments are so precise”. Pre-service teachers also reported that the video feedback could “pinpoint specific moments” and “exactly which parts worked/ did not work” because it “helped me to see exactly where I needed to improve and provided me with indisputable and easily understandable examples”.

There were also some challenges. Sometimes feedback comments were not posted until a few days after the lesson and the response came too late to be effectively used by the pre-service teacher because new issues of classroom practice had arisen in the intervening period which made the suggestions “not very viable”. Some pre-service teachers felt that receiving feedback from their university supervisor remotely via the video annotations was impersonal and “It would have been good to meet with my university supervisor prior to the prac so I would have a face to put to all the conversations”. Another pre-service teacher commented, “I think the university supervisor needs to talk with the student rather than make comments on a short video” as this would have been “more authentic and useful”. However, the impersonal nature of the video feedback was also viewed as beneficial because “you can comment without offending anyone - the objective part of the video means you’re commenting on the clip, not the person” (university supervisor).

A Focus on Student Learning

Video allowed pre-service teachers to step back from their practice and more closely observe how students were working—something they were generally unable to do as effectively whilst teaching the lesson. One of the supervising teachers noted that her pre-service teacher was “looking at the lesson with a more-narrow perspective after she’d finished teaching, focused on her teaching strategies and from a personal note” whereas after viewing the video “she was looking at the boys, were they engaged, were they focused”. The focus on student learning provoked further reflection among pre-service teachers and they reported how this helped them make sense of their teaching as they recognised why lessons did not always turn out as they had intended. This realisation would often trigger additional questions about their practice as it “allowed me to review my practice and view for myself the effect of pedagogy on student learning, thus allowing me to further engage in more effective strategies”. One supervising teacher described how patterns of practice began to emerge from his pre-service teacher’s reflections. So, while “initially she was just going

through her extremely well-planned lesson and not altering that”, later on she “was then listening to their [students’] responses more and changing the lessons, you know, she was able to reflect on the spot. Whereas before, it was always in retrospect”.

Pre-service teachers were encouraged to discuss which part of the lessons they recorded with their supervising teachers. For example, “My teacher and I discussed areas where I could improve and that’s how I decided which part to film. She also recommended choosing different learning areas, so we also did that”. Most pre-service teachers selected what they regarded as the best aspects of their lesson to share with their supervisors; however, this was not always the case. For example, one pre-service teacher commented in the interview, “I specifically picked a part where the students were working because I wanted to see the children’s dialogue and see how well I was at monitoring each group”. Another pre-service teacher stated, “I recorded a couple and purposely uploaded my poorer ones to critique the feedback” while another reported that she “picked where I wanted to film because I had things I wanted to work on” and another said he “marked out where I wanted to be critical of my lesson and focus in on that”. These comments suggest that these pre-service teachers saw value in the feedback they received because they were willing to share videos that included aspects of their practice that they wanted to improve.

Triad Sharing

The ‘triad’ model was generally regarded as supportive by pre-service teachers because, “It was incredibly useful to receive regular feedback from additional perspectives which offered more insights into ways to improve” and “were two sets of eyes looking at the lesson, looking at different things and then cumulatively giving feedback”. The range of opinions shared provided opportunities for each person to further reflect since “by listening to the other members’ observations meant that you could revisit your own comments in light of theirs” (university supervisor) and “there was much more of a collaboration and we were reflecting together” (supervising teacher). Another supervising teacher remarked on the variety of ideas expressed among the triad members “we were all giving feedback on different things, different aspects that we had written comments on the specific moment from the video”.

An analysis of the patterns of response study revealed that the 1,228 annotations occurred within 646 discussion threads, of which 356 (55%) were single comments that were not responded to by any of the other triad members. However, when Triads 9 and 10 were removed from this analysis (these triads were dominated by Short D1 comments mainly from the university supervisor), 343 discussion threads remained across the other nine triads. For these nine triads, no response was made to 116 annotations (34%). Of those comments that did receive a response, 110 (32%) were threads of three or more comments and 86 threads (25%) included comments from all three triad members.

The role of the university supervisor as a ‘remote’ member of the triad is a feature of the present study. The ongoing involvement of the university supervisor through the video process was a change from their usual role of visiting the school for one lesson observation followed by a discussion with the supervising teacher and the pre-service teacher. In contrast, the video recordings allowed the university supervisor to see “more examples of teaching practice” and “progression across the four-week block” (supervising teacher). Also, the sharing of ideas through the annotations made the university supervisor a more constant ‘presence’ during the placement and “It was incredibly useful to receive regular feedback from additional perspectives, which offered more insights into ways to improve” (pre-service teacher).

A one-off supervisory visit was seen as less effective by many pre-service teachers who had previously completed a placement because “how much can they [university supervisors] really know of your teaching from one lesson?” and “they don’t ever get to know you as a teacher, they don’t ever get to know you as a person” (pre-service teacher). Another pre-service teacher observed in the interview about her greater connection with her university supervisor through the video process because “he was able to give me such detailed feedback because he could see how I was progressing each week so I felt much more connected to being able to ask for advice from him and being able to get advice that I felt was relevant to who I am as a teacher.”

Discussion

This paper reported on the results of a pilot study in which pre-service teachers annotated video recordings of their lessons during professional experience. They shared the videos with their supervisors who provided feedback by responding to the pre-service teachers’ reflections and adding further comments of their own. The annotations were analysed for the depth of reflection using a framework designed by Author (2014) and the study also investigated the participants’ views about the video reflection process.

Pre-service teachers tended to describe events from their lessons rather than analyse them (Chamoso & Cáceres, 2009; Davis, 2006). The supervisors were inclined to evaluate the descriptions already provided by pre-service teachers rather than adopt actions consistent with the recommendation of Jones and Ryan (2014) by posing questions and modelling reflective thinking. Consistent with Gelfuso and Dennis (2014), there was also evidence that pre-service teachers in the present study did not often build on a supervisor’s response and the lack of prompting and question posing by supervisors may have exacerbated this. These results highlight that if video is to promote pre-service teacher reflection it needs to be combined with structured support (Weber et al., 2018) and that the role of supervisors is crucial in providing expert feedback to encourage pre-service teachers’ reflections.

While it was important to allow pre-service teachers some autonomy in selecting the lesson excerpts and instigating the commentary on them, the relatively low proportion of reflective commentary suggests, contrary to Danielowich (2014), that participants might have benefitted from more direction on how to structure their annotations. For example, it might have been better to provide follow the method of Kleinknecht and Gröschner (2016), who instructed the participants in their study to use a three-step approach (describe, evaluate and explain the evaluations, create alternative teaching strategies). This is consistent with the advice of Tripp and Rich (2012) to allow pre-service teachers to choose the focus of their reflection and provide a framework or structure to enable them to narrow the focus of their reflective thinking.

Learning to notice allows teachers to propose alternative instructional strategies (Santagata & Guarino, 2011). The results from the present study support the use of video as a tool which can ‘slow down’ the lesson and allow pre-service teachers to analyse their practice (Chung & van Es, 2014). However, ‘imaginative’ comments which propose an alternative action are more likely to provide guidance for future actions when they are based on an ‘reflective’ analysis. Despite this, the participants’ self-reports indicate that the triad groups promoted pre-service teachers’ professional learning and reflection. This is significant because the triad model, unlike previous video reflection programs cited in this paper, could be scaled up for implementation across an entire teacher education program since it does not rely on academics or specialist coaches. The results also demonstrate that triads are more

likely to support pre-service teachers' reflective practice if university supervisors have previously met with pre-service teachers and that their comments are posted in a timely manner. Supervisors should post comments that call for a response from pre-service teachers and encourage pre-service teachers to analyse and reflect on their teaching, but they should also avoid dominating the annotation threads to allow space for other members to participate.

Conclusion

The results of the study contribute to the growing body of research evidence about the efficacy of video as a tool for pre-service teacher reflection. Pre-service teachers benefit from guidance provided by experienced teachers and supervisors in identifying incidents or issues on which to reflect. Novices also require some scaffolding to help them advance beyond simple descriptions or evaluations of their practice. However, too much assistance or feedback can be counterproductive and pre-service teachers also need some freedom to develop their own ideas. The study also shows that feedback provided through the use of video is effective, even when the university supervisor does not observe the lesson 'live'. This finding suggests that remote supervision of pre-service teachers via video can be useful, particularly through observation and feedback for multiple lessons over an extended period of time – something that is usually not feasible for 'in person' school visits.

The study has some limitations associated with the relatively small sample size and relatively short timeframe of the professional experience placement. The study is also limited by the lack of a control group to compare annotations made by similar cohorts of pre-service teachers and supervisors who did not have access to the platform. Future research could therefore use an experimental design over a longer time period. It might also be useful to follow a group of pre-service teachers into their first year of teaching to investigate if their participation in the video reflection process had any on-going impact on their practice.

Despite its limitations, the study provides further evidence to support the use of video as a tool for pre-service teacher reflection and identifies the important role that supervisors can play in promoting pre-service teachers' reflective practice. The key is striking the right balance between pre-service teacher autonomy and scaffolding their reflective thinking to provide sufficient feedback and guidance without dominating the discussion.

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