How does the concept of extended pedagogy enhance our understanding of literacy teachers learning with digital video?

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Abstract
The paper draws on two separate studies using digital video to support the professional development of literacy teachers, and specifically to explore what and how teachers learn with videos of literacy instruction.

The first study focussed on how experienced teachers learn through critiquing videos of literacy teaching in Key Stage 2 classes using a reflective discussion board, while the second study looked at the learning of Key Stage 1 teachers through their multiple shorter postings on a bulletin board. Both studies used Interactive Classroom Explorer (ICE) as the medium for viewing, reflecting on and posting their responses to digital video extracts.

In seeking to explore how teachers learn from digital video, the paper specifically draws on and discusses findings from both studies that relate to notions of 'extended pedagogy'. In synthesising the findings to better understand how teacher learning with digital video might be maximised and embedded, the paper draws attention to the concepts of conflict resolution and challenge solution as mediators of extended learning.

Key words: teacher, learning, video, extended, pedagogy

Introduction
This paper draws on data analysis from two independent studies completed in 2007 and ideas formulated during and after the respective research periods. So why write this paper now, and what potential contribution might it make to policy and practice? The recent change in government in the UK has brought changes in educational priorities, policies and plans for new state-lead initiatives. These changes have lead us to expect the dissemination of new video material to encourage teachers to adapt their practices and change their classrooms to accommodate the latest educational directive, such as the emphasis the new government is placing on teaching synthetic phonics. In recent times, social technologies populated with video clips of professional practice, such as Teacher Tube and YouTube, have somewhat replaced the top-down authoritarian model of exemplary video often associated with the introduction of national educational initiatives and intended to influence changes in the professional practice of in-service teachers. However, in our opinion, it is likely that an authoritarian model of video use will be proposed again in the next wave of government directed educational initiatives. Lack of research evidence on teacher learning with video, and lack of research on teachers’ representations of alternative pedagogies in response to videos of professional practice in particular, leaves teacher practitioners and teacher developers seriously under-prepared for using video effectively as a tool for teacher learning.

In writing the present paper, we hope to offer ways forward for beginning to address these issues at such a critical time.

The research question in both studies reported here was ‘How do experienced teachers learn from digital video of classroom practice?’

In this paper we explore the question ‘How does the concept of extended pedagogy enhance our understanding of teacher learning with digital video?’ by drawing on findings from two studies.
**Background**

In the current educational-political climate, the rationale for the present paper and the two studies it draws on was informed by concerns about the seeming inadequacy of current models of teacher learning (of literacy) to satisfactorily explain how teachers learn from videos of literacy instruction, and the problematic concept of exemplary teaching. An additional concern was the lack of research on teachers’ representations of alternative pedagogies in response to videos of professional practice.

**How do models of teacher learning with video contribute to models of teacher learning, and vice-versa?**

Exploring the possibilities of video for teacher development, Sherin (2007) usefully highlights the concept of professional vision, which involves the ability to notice and to interpret significant features of classroom interactions. Sherin (2007) identifies selective attention and knowledge-based reasoning as key processes that interact dynamically in attaining professional vision when making sense of a video of classroom-based teaching and learning. However, Sherin (2007) emphasises that while such possibilities of video for enhancing teacher learning are recognised, the role of video in actually supporting teacher learning is not well understood.

Jucks et al (2003) present an important perspective on cognitive elaboration in learning with representations. An emphasis is placed on the selection, organising, cognitive structuring, elaboration and restructuring of material for information to be retained in memory and for a new memory structure to be developed. The cognitive elaboration perspective on learning highlights the role of discourse, where communication about the learning material, such as explanation, supports elaboration and restructuring. This perspective on learning usefully extends the functional stages of organising and integrating learning proposed by Mayer (2001) and criticised as over-simplistic by Ainsworth (2006), and may therefore be important in understanding teachers’ learning in response to videos.

Issues around how models of teacher learning with representations, such as digital videos, contribute to models of teacher learning are not trivial and are the subject of controversy – examples outside the realm of education are being exalted as case exemplification (weather maps). At the same time, some popular models of multimedia learning have been criticised as armchair theorising that fail to provide explanations of cognitive activity leading to learning. Such models of learning, based on a dual processing theory of visual and auditory information processing, assume that if teachers are presented with videos of exemplary pedagogic practice they will learn from them. While where the areas of teacher learning and learning from representations meet and converge is under-theorised at a cognitive level, there appears to be an assumption that teachers will learn from videos in fairly unproblematic ways.

An acceptance of this assumption would appear to have underpinned the creation and distribution of videos on a national scale, at great expense, to support education initiatives in (English) schools in recent years. However, there is little research evidence to support the notion that teacher learning proceeds in this way. Rather, cognitive theories of learning suggest that there is much more work to be done by applying a cognitive perspective to understand how teachers learn from (or with) video representations (Ainsworth, 2006; Ploetzner et al, 2004).
In fact, the notion of learning 'from' video is distinctly unhelpful, suggesting as it does that the video has authoritative superiority and occupies the educational moral high ground to which teachers should aspire. Learning 'with' video is a preferred description, re-addressing the power relationship between teacher and video and implying a more active and selective learner role, increased opportunity for meaningful learning and uncertain learning outcomes for the viewing teacher. Moreover, by conceptualising learning with video in this way, the opportunity is immediately created for raising the educational profile and recognition of research that has focussed on conflict resolution (Derry et al, 2000), noticing (van Es et al, 2002), and Self and Other (Roth 2003; 2007), which have made a valuable contribution to understanding cognitive processes associated with learning with video, but which hitherto appear to have had little opportunity to impact on practice in England. Roth (2007), for example, presents the concept of video as epistemic mediation and the objectification of teachers’ own practice, and highlights the tension between what teachers see in a video (other-self) and what they would like to see (self-other).

The concept of exemplary teaching
The previous section leads us to the concept of exemplary teaching, often promoted through the encapsulation of sanitised and metaphorically airbrushed vignettes of ‘teaching and learning’, where the ‘reality’ of classrooms and literacy instruction represented in videos intended for teachers’ professional development is questionable on several levels, for example where realistic class sizes are not reflected and where the complexities if teaching and learning are not represented (Lye, 2005; Sheard, 2007). It is important to note that teachers’ responses to the promotion of the concept of exemplary teaching in videos can be various. At one level, teachers may dismiss the video extract as an unreal representation of real classrooms and real children and therefore irrelevant; at another level, teachers may find the video offensive and potentially stressful in presenting a demeaning invitation to reflect on a teacher’s own (dissimilar) practice. At a third level, teachers’ attention is drawn to irrelevant detail that we might describe as a focus on ‘dresses, tresses, and stresses’. It may be helpful to represent in diagram form how the traditional vertical authority structure for teacher development using video of exemplary practice can result in these non-productive outcomes for experienced serving teachers (see Figure 1) compared with a more equitable authority model that represents teacher learning with video on a horizontal plane (see Figure 2).
Figure 1. Traditional exemplar video for teacher development-vertical authority structure

1. Dismiss the video as an unreal representation
2. Find the video offensive
3. Focus on irrelevant detail

(Adapted from Harrison et al, 2006).
While social technology networks and spaces have provided the opportunity in recent times for the more equitable model of authority, as shown in Figure 2, in reflecting on practice, little is still known about the nature and process and focus of teacher learning across the domains and dynamics they support.

In fact, both diagrams in Figures 1 and 2 above would seem to be incomplete. They fail to represent the possibility of teachers’ peripheral or extended learning that may be directly unrelated to the instructional content of a video and that refers to other content, ideas or learning prompted by the intended content matter represented in a video. Such peripheral or extended learning is what we have previously referred to as not P, possibly Q, and possibly R (Harrison et al., 2006) and to which we will return later in this paper.

Engestrom’s (1987, 1999) concept of learning by expanding, involving renegotiation and reorganization of relations and practices, seems to fit well here. Engestrom suggests that the process of expansive learning may be understood as the construction and resolution of tensions or contradictions, where contradiction and debate are central in knowledge creation. Conceptualising teachers’ extended learning in this way leads us to a further set of considerations about teachers’ representations of extended or alternative pedagogies: what cognitive processes are involved, what is the focus of teachers’ learning, and how does extended learning contribute to teachers’ professional development and impact on practice? We address these questions below in reference to two research studies that aimed to investigate teacher learning in response to videos of professional practice.
Method
Introduction to the two studies

The lack of research in teachers’ extended learning from videos means that little is still known about the fine-grained cognitive processes that are brought into play (Ploetzner, 2004), particularly in authentic professional learning contexts. The present paper re-frames the concept of learning by expanding, which we are calling extended learning, drawing on two independent studies of teacher learning from digital videos of literacy instruction.

Twelve teachers from 6 schools in three local authorities in the North of England participated in the first study as three school-based pairs and six individual respondents. In the second study, fourteen teachers from seven schools in one local authority in the Midlands participated in school-based pairs. The first study was conducted over one school year, and the second study took place over a four month period.

Using oral protocols and reflective discussion board postings, the first study focussed on how experienced teachers learn through critiquing videos of literacy teaching in Key Stage 2 classes. Critiquing video refers to teachers’ exploration of ideology and reality in video; it engages teachers in defending their interpretations of the teaching represented, and indicating an intention to accept (P) or modify (Q) examples of teaching to those represented in the video, or to provide different examples (R). A central analytical focus was cognitive epistemic activity (CEA) evidenced in teachers’ discourse.

The second study looked at the learning of Key Stage 1 teachers through their multiple shorter reflective postings on a bulletin board.

Study 1.
This study investigated how teachers learn from critiquing videos of literacy instruction individually and in pairs, using Interactive Classroom Explorer (ICE) as an environment for viewing and responding to videos in two parts of the year-long study. Twelve teachers from six schools in three different local authorities participated. Seven video clips were used; six were produced by the National Literacy Strategy and one was filmed during a lesson taught by a participating teacher. Teachers provided taped oral protocols and written textual responses to the video clips, using the video quotation facility of ICE to select a segment of the video as the focus of their critique. The unit of analysis was an utterance (Jordan et al., 1995) indicating evaluating, describing, explaining, explicating, arguing, predicting or defining, described by Ohlsson (1995) as cognitive epistemic activities (CEA). The data set comprised of eighty-five oral protocols, and forty-nine word-processed responses, which together produced 2133 utterances representing cognitive epistemic activity. Stringent inter-rater reliability tests in Study 1 for cognitive epistemic activity produced an average coefficient of .74, p= 0.00, with substantive agreement on identification of grammatical boundaries, which were not pre-determined.

Study 2.
As part of a national blended learning initiative funded by the UK government, a team of researchers worked with Key Stage 1 teachers in seven schools to evaluate video aimed at supporting the teaching of phonics. Teachers attended a training event and were then asked to view video segments of exemplary teaching using ICE, and asked to discuss these within their own school. The teachers were asked to post two responses for each video segment,
using ICE: a video quotation with commentary, and a comment on the ideas of another group. Postings were anonymous. Data collection took place over a four-month period, with a local authority literacy consultant also acting as an informal bulletin board moderator. Once one or two postings had been made giving general support for the teaching activity represented, the participating teachers were asked not to repeat the comments of others, but to try to add something new. A total of 20 postings containing 83 comments were made.

**Similarities in the two studies**

In both studies the participating teachers were committed to literacy teaching, responded as individuals but mainly as school-based pairs, and were recruited through convenience sampling. Both studies used Interactive Classroom Explorer (ICE) as the medium for viewing, reflecting on and posting their responses to digital video extracts. ICE is a computer-mediated interface for viewing and critiquing digital video regarded as depicting exemplary practice (Harrison and Pead, 2006). ICE affords opportunities to facilitate professional conversations by permitting close attention to the content, discourse and pedagogy of a lesson or teaching and learning event. In particular, with ICE the user can draw upon the video, the transcript and pop-up resources such as the lesson plan, and student work, as evidence upon which to make judgements about teaching and learning. The user can also select their own ‘video quotations’ that can be stored in a personal area or pasted into emails or discussion board messages in professional fora. In both studies, the video quotation feature of ICE was used to select particular video extracts that teachers chose to comment upon.

**Differences between the two studies**

Differences between the two studies were the schools involved; the Key Stage focus (Key Stage 2 in the first study and Key Stage 1 in the second study); the professional development context, where the second study was conducted within an existing professional development project and the first study was stand-alone; the involvement of the Local Authority Adviser in the second study; videos used in the studies (focussing on teaching writing in the first study and phonics in the second study); and the response tasks (to provide a professional response as a critique in the first study, and a commentary and a new comment in the second study).

**Analytical framework**

The present paper adopts a socio-cognitive perspective on teacher learning that brings together three complimentary analytical frames. Firstly, teachers’ responses were analysed in reference to the Cognitive Epistemic Activities (CEAs) leading to learning through discourse, proposed by Ohlsson (1995) and including describing, evaluating, explaining, explicating, arguing, and predicting. Secondly, the notion of learning through conflict resolution was applied (Derry et al, 2000) in which a video representation is regarded as an external event that brings prior knowledge into working memory. [The prior knowledge serves to interpret and understand the representation, and the initial conditions for learning are established.] Conceptual conflicts between prior knowledge and the incoming information create the context for learning to occur.
Thirdly, the cognitive elaboration theory of learning with representations proposed by Jucks et al (2003) provided a focus on the selection, organising, cognitive structuring, elaboration and restructuring of material for learning, which also emphasises the role of discourse.

Identifying teacher learning

In the first study, a critical learning event (CLE) was identified as an indication in a teacher’s discourse of a restructuring of ideas, knowledge, beliefs or principles that underpin pedagogical practice, or as an intention to change pedagogical practice in some way. In the second study, learning was identified as an extended set of teaching points representing teachers’ shared reflective professional knowledge about the implementation of an early reading curriculum. We may legitimately and usefully also regard these teacher learning points as signifying critical learning events (CLEs) where they meet the following criteria:

- coherent mental representations constructed from presented material and reflected in the ability to use the presented material in novel ways; (Mayer, 2001)
- derive from selecting, organising, structuring elaborating and re-structuring of learning material (Jucks et al, 2003).

Findings

Findings from the first study suggested that extended pedagogy accounted for teacher learning about modeling, task setting, questioning, increasing pupil interaction, subject knowledge, and resources. The study indicated how cognitive epistemic activities mediate five stages of learning, from selecting a video quotation to structuring, elaborating, restructuring, and integrating new pedagogical knowledge.

Findings from the second study showed that teachers’ bulletin board comments on pedagogy, which were mainly descriptive, were often complex and detailed and made explicit a great deal of collective knowledge about the early teaching of phonics. However, the additional constraint that bulletin board postings should not repeat comments made previously and should add something new, resulted in the posting of more ‘extending pedagogy’ comments. Such comments were more reflective, analytical, evaluative and constructively critical than the earlier descriptive comments.

This section reports on findings drawn from the two studies in terms of critical learning events (CLEs), cognitive processes (cognitive epistemic activity, CEA), learning themes, and how teacher learning with video occurs (conflict resolution and challenge resolution).

Critical Learning Events.

In the first study, a total of 47 CLEs were identified in 31 out of 134 transcripts in reference to viewing video clips, 31 were using Interactive classroom Explorer (ICE) (Harrison et al, 2006) as the critiquing environment and 16 were not, and 39 were identified in oral protocols and 8 in teachers’ written responses to video clips. Paired groupings produced 42.5% of the CLEs.

In the second study teacher learning was identified in 42 separate pedagogic and extended pedagogic points made by teachers in 20 bulletin board postings.
Cognitive Epistemic Activity in Critical Learning Events

A main focus of inquiry in the first study was the relationship between cognitive epistemic activity and teacher learning. Cognitive epistemic activity (CEA) is defined in the study as a higher-order thinking task carried out when talking or writing, in the form of evaluating, describing, explaining, explicating, arguing or defining. Teacher learning was identified in terms of critical learning events (CLEs) as described above. As Table 1 shows, the number of critical learning events (CLEs) featuring evaluating, describing, explaining, explicating and arguing suggests that these are strongly associated with teacher learning through critiquing videos of literacy instruction.

Table 1. Cognitive Epistemic Activity in Critical Learning Events in Study 1.

<table>
<thead>
<tr>
<th>Cognitive Epistemic Activity</th>
<th>No. Critical Learning Events</th>
<th>% Critical Learning Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluating</td>
<td>29</td>
<td>62</td>
</tr>
<tr>
<td>Describing</td>
<td>21</td>
<td>45</td>
</tr>
<tr>
<td>Explaining</td>
<td>32</td>
<td>68</td>
</tr>
<tr>
<td>Explicating</td>
<td>34</td>
<td>72</td>
</tr>
<tr>
<td>Arguing*</td>
<td>10</td>
<td>21</td>
</tr>
</tbody>
</table>

*It should be noted that while arguing features less than other cognitive epistemic activities (CEAs) in critical learning events (CLEs), it appears to feature more in critical learning events (CLEs) than in other parts of teachers' discourse.

Explicating was defined in the study as clarifying the meaning of a teaching or learning event or process by illustration or elaboration. Table 1 suggests that explicating features in more critical learning events (CLEs) than do other cognitive epistemic activities (CEAs). If we accept that explicating functions to extend cognitive associations from the immediate content of the video to the domains of actual and imagined instructional practices, as a form of extended pedagogy, we can see how this enhances our understanding of literacy teachers learning with digital video. Moreover, further analysis in the first study revealed statistically significant findings (Chi square 13.49, df = 2, p = 0.00) that teachers demonstrating relatively high frequencies of explicating, explaining and arguing in their responses to video clips accounted for 60% of the critical learning events identified in the first study.

Examples of teacher explication in critical learning events in the first study are presented below. The first relates to the teacher’s understanding and acceptance of terminology relating to genre, while the second and third examples refer to a video depiction of teacher modelling in a writing lesson:

“I suppose she is talking about the genre of suspense writing that she is using as a label for scary writing. I don’t really like these genres. I think it is a bit cliched with children, whereas when it says “suspense” it means to me something more specific, which means ‘suspend’.”

“It made me consider the ratio of time I spend modelling thinking to children compared with the amount of time I spend simply demonstrating writing.”

“I would probably have had some input from the children in the first part, asking for a suggested verb or asking them to write a verb on a white board and hold it up.”

Applying the cognitive epistemic lens to findings produced in the second study reveals a similar pattern to that represented in the first study, particularly in explicating, as Table 2 illustrates below.
Table 2. Cognitive Epistemic Activity in Comments in Study 2.

<table>
<thead>
<tr>
<th>Nature of Comments</th>
<th>Cognitive Epistemic Activity Represented</th>
<th>Number of Comments</th>
<th>% Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive or negative comments</td>
<td>Evaluating</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Comment on pedagogy</td>
<td>Describing</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Comment extends pedagogy</td>
<td>Explicating</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td>Other</td>
<td>Evaluate/Describe/Question</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N = 83</td>
<td></td>
</tr>
</tbody>
</table>

The apparent absence of explaining in teachers’ comments in the second study may be due to the nature of the task (teachers were asked to identify particular sections of the video to exemplify specific points using the discussion board feature of ICE, not to repeat the comments of others, but rather to try to add something new) and a consequence of the brevity of the postings (mean length was 63 words). This compares to the first study in which teachers’ responses to video which were time-extended, took the form of conversations, oral protocols and reflective written responses and were deeply reflective and analytical. However, Table 2 clearly shows the important contribution made by teachers’ explications to teacher learning by extending pedagogy in the second study, so providing findings compatible with those obtained from the first study.

Teachers’ oral protocols and written responses to videos in the first study permitted analysis of the role of explicating in the various stages of learning with representations suggested by Jucks et al (2003). Table 3 below presents a tentative taxonomy of explicating in teacher learning with video, adapted from Ohlsson (1995). Particular attention is drawn to the role of explicating in the stages of elaborating and restructuring that this paper wishes to highlight as features of extended learning.
Table 3. A taxonomy of explicating in extended learning with video.

<table>
<thead>
<tr>
<th>Explicating</th>
<th>Selecting</th>
<th>Structuring</th>
<th>Elaborating</th>
<th>Restructuring</th>
<th>Integrating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Highlights professional reality.</td>
<td>Identifies ideological issues associated with the selected video focus.</td>
<td>Indicates possibility for greater depth and complexity in treatment of subject matter in the video clip.</td>
<td>Refines, revises or develops a teaching idea.</td>
<td>Appropriates an aspect or extension of the teaching represented in the video.</td>
</tr>
<tr>
<td></td>
<td>Identifies an opportunity to modify the teaching represented in the video clip.</td>
<td>Suggests a wider exploration of the pedagogy underpinning the teaching focus in the video clip.</td>
<td>*Focuses on comparisons in ideology and professional reality.</td>
<td>*Clarifies and summarises a perceived problem with the teaching represented in the video.</td>
<td>Justifies the acceptance, modification or reworking of an aspect of the teaching represented in the video.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Introduces speculation, discussion and argumentation.</td>
<td>Asserts professional identity and authority.</td>
<td></td>
<td>Asserts professional identity and authority.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Indicates professional solidarity.</td>
</tr>
</tbody>
</table>

Review of the extended pedagogy comments made by teachers in the second study suggests that, with the exception of the functions identified by *, the taxonomy applies. Examples of teachers’ comments extending pedagogy through explication are presented below:

“If small group playing of the ‘Master Master’ game is impractical, it can be played with a larger group using cvc’s and grouping the children in mixed ability pairs.”

“In the video, the ‘golden river’ appears to be imaginary; for many learners, an old bit of gold tinsel could provide a more visible (though of course still magical) ‘golden river’.”

“The following variation on the words spoken by the children in the ‘Master Master’ game provides a useful focus on its phonetic theme: ‘Can we cross the golden line? Is your word the same as mine?’”

Learning Themes in Critical Learning Events
In both studies reported here it was possible to identify a similar set of learning themes in teachers responses to professional development video clips, suggesting a number of pedagogic concerns around literacy instruction as represented in the videos and relating to teachers’ own instructional practice. Through a process of constant comparison, the following learning themes were identified in the first study:
Improving teachers’ exposition, including how they model writing; ensuring the appropriateness of literacy tasks; teacher questioning skills; increasing pupil interaction in literacy lessons; extending teachers’ literacy subject knowledge; and resource development. It was possible to apply the same thematic lens to teachers’ postings in the second study. Table 4 compares how the themes featured in teachers’ responses in the two studies.

Table 4. A comparison of learning themes in the two studies.

<table>
<thead>
<tr>
<th>Learning Themes</th>
<th>First Study (N = 47)</th>
<th>Second Study (N =42)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher exposition/ Modelling</td>
<td>10 (21%)</td>
<td>7 (18%)</td>
</tr>
<tr>
<td>Appropriate task setting</td>
<td>9 (19%)</td>
<td>8 (19%)</td>
</tr>
<tr>
<td>Teacher questioning skills</td>
<td>7 (15%)</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Increasing pupil interaction</td>
<td>4 (8%)</td>
<td>6 (14%)</td>
</tr>
<tr>
<td>Extending teacher subject knowledge</td>
<td>10 (21%)</td>
<td>9 (21%)</td>
</tr>
<tr>
<td>Resource development</td>
<td>7 (16%)</td>
<td>11 (26%)</td>
</tr>
</tbody>
</table>

*Subset of 42 comments meeting criteria for critical learning events

**Conflict resolution**

It is important to note that teacher learning identified in the first study was often in response to videos that teachers considered did not exemplify best practice. The teachers’ learning was often situated within the resolution of conceptual conflicts they experienced in reference to a video representation of literacy teaching. The concepts of internal conflict resolution (resolving a conflict between the video representation of literacy teaching and the teacher’s own literacy instructional practice) and external conflict resolution (resolving a conflict between instructional practice in the video representation of literacy teaching and the teacher’s belief about a shared professional body of knowledge and accepted practice) can therefore be applied as analytical tools in this context. Table 5 shows the learning themes in critical learning events (CLEs) in the first study in terms of internal conflict resolution and external conflict resolution.

Table 5. Learning themes in internal and external conflict resolution in critical learning events in the first study.

<table>
<thead>
<tr>
<th>Learning Themes</th>
<th>Internal Conflict Resolution (N = 23)</th>
<th>External Conflict Resolution (N = 24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher exposition/ Modelling</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Appropriate task setting</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Teacher questioning skills</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Increasing pupil interaction</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Extending teacher subject knowledge</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Resource development</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 5 suggests that external conflict resolution provides an important way of conceptualising and demonstrating learning with video through extending pedagogy, and of identifying the focus of that learning.

Table 6 shows the learning themes in critical learning events in the second study.
Table 6. Learning themes in critical learning events associated with comments on pedagogy and comments extending pedagogy in the second study.

<table>
<thead>
<tr>
<th>Learning Themes</th>
<th>Comments on Pedagogy N = 15</th>
<th>Comments Extends Pedagogy N = 27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher exposition/ modelling</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Appropriate task setting</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Teacher questioning skills</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Increasing pupil interaction</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Extending teacher subject knowledge</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Resource development</td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>

**Challenge Solution**

In Study 2, teachers’ responses to the video were generally affirmative and positive in tone. Only six negative remarks were identified, and in each case were accompanied by a comment that extended the pedagogy represented in the video. It therefore seems more appropriate to consider ‘Challenge Solution’, rather than Conflict Resolution, as the cognitive process underpinning the learning in the second study in reference to positive comments extending pedagogy. We would define ‘Challenge Solution’ as the construction or co-construction of new applications or extensions of an accepted pedagogical practice, and will consider this further in the discussion section.

**Discussion**

While the studies reported in this paper had methodological and analytical differences as well as similarities (see Introduction to Methods section), their combined findings provide useful insights into the nature of extended learning through explication in elaborating and restructuring learning material presented in video (leading to a re-presentation of video content or the representation of new pedagogic content).

Reflecting on the robustness of the findings and interpretations presented in this paper, the authors acknowledge the relative small scale nature of both studies, in terms of numbers of teachers participating and numbers and type of videos used, and the high level of analytical interpretation applied in each case. Nonetheless, the authors would argue that the theoretical underpinnings, methodological considerations, richness of the data obtained, inter-rater reliability coefficients in Study 1 (average of .74, p= 0.00), depth of analysis and the complimentary findings suggest an acceptable degree of robustness.

As noted earlier, teacher learning identified in the first study was often in response to videos that teachers considered did not exemplify best practice. The teachers' learning was often situated within the resolution of conceptual conflicts they experienced in reference to a video representations of literacy teaching. While the concept of internal conflict resolution (resolving a conflict between an unproblematic/accepted video representation of literacy teaching and the teacher’s own literacy instructional practice) helps us to understand how intended learning outcomes from viewing a video may be achieved, the concept of external
conflict resolution (resolving a conflict between instructional practice in the video representation of literacy teaching and the teacher’s belief about a shared professional body of knowledge and accepted practice) offers a useful analytical dimension that helps to develop our understanding of extended learning with videos (See Figure 3 below). Moreover, the concept of external conflict resolution may help to explain extended learning with the same content as that represented in the video, which we might call (Q), and also extended learning with different content brought to mind by association with the video, which we might refer to as ‘R’ (of which 8 examples were identified in the first study, associated with teacher modelling (4), task setting (1) teacher questioning (1) and resource development (2)).

Figure 3. Learning with video as Internal Conflict Resolution and External Conflict Resolution.

We can see below how Figures 1 and 2 might be revised as Figures 1a and 2a to represent the possibility of extended learning with the same or new content.

Figure 1a. Revised traditional exemplar video for teacher development: vertical authority structure.
1. Dismiss the video as an unreal representation (not P)
2. Find the video offensive
3. Focus on irrelevant detail

Q. Extended learning with the same content
R. Extended learning with different content

Figure 2a. Revised non-hierarchical video for teacher development: horizontal authority structure.

The combined analysis from the two studies places an important check on possible over-interpretation of findings from the first study in terms of the centrality of conflict resolution in learning with video, and indicates the importance of recognising where extended learning might occur in response to videos received positively by teachers. In the second study only six negative remarks were identified, and in each case were accompanied by a comment that extended the pedagogy represented in the video. This finding suggests that even if...
emulating the video was a challenge, the teachers were determined to be creative in finding a way to meet that challenge.

The concept of Challenge Solution, which we define as the construction or co-construction of new applications or extensions of an accepted pedagogical practice, would therefore seem helpful in offering a means of understanding teachers’ extended learning from video in cases where the video content appears to be unproblematic and is acceptable to teachers in content, tone and model of delivery. Such new applications or extensions of pedagogic practice in the second study meet the requirements for learning identified earlier as: i) coherence of mental representation constructed from presented material and reflected in the ability to use the presented material in novel ways; (Mayer, 2001), and ii) derived from the selection, elaboration and re-structuring of learning material (Jucks et al, 2003).

Figure 4 shows how extended learning through Challenge Solution might be represented.

Figure 4. Challenge Solution leading to Extended Learning with video

The findings therefore both support and complement Engstrom’s theory of expansive learning, which emphasises the role of contradiction and debate for learning. The view of extended learning we are presenting here usefully juxtaposes the concepts of expansive learning and challenge solution to explain the different ways in which teacher learning with video might proceed. However, a degree of caution should also be applied when interpreting teachers’ positive responses to video, as in the second study, where the large majority of teacher comments affirmed the practice represented in the video. In this case, there may have been a cultural expectation that responses to the video should not depart from the specific context and instruction depicted, particularly as the teachers were engaged in a formal professional development project on phonics, supported by their education adviser.

Both studies demonstrate the important role played by ICE as a learner reflective-learner response environment that mediates extending pedagogy across multiple learning themes.
using a range of cognitive strategies by facilitating the stages of learning with representations, identified as selecting, organising, structuring, elaborating, restructuring and integrating. Moreover, the video quotation facility of ICE enables teachers to extend the pedagogy represented in the video and their own pedagogical knowledge. In both studies, the researchers conclude that ICE provides a supportive and non-threatening environment for sharing good practice in literacy instruction. ICE may usefully support training /CPD initiatives in which there is little opportunity for group meetings, for example in similar schools in different local authorities, and in other curriculum areas. Importantly, as a vehicle for extending pedagogy, ICE provides a platform for practitioner discussion that is non-hierarchical and which permits teachers to assert their own professional identity, authority and solidarity in co-operative and collegiate ways that are essentially empowering.

In conclusion, the studies reported here indicate the possibility for extended learning with video, a wider exploration of the pedagogy underpinning the teaching focus in the video clip, through responding to conflict and challenge. This has significant implications for the teaching profession and its developers in terms of professional knowledge creation and dissemination at formal and informal levels. The traditional way of using video clips as tools for teacher learning, which often demands little of the viewers in terms of cognitive engagement and usually assumes a vertical authority structure, seems a missed opportunity for professional knowledge creation and dissemination. Further research is now required into the effectiveness of conflict resolution and challenge resolution as learning strategies for maximising teachers’ professional development opportunities for extended pedagogy using digital video, and video quotations in particular.

References:


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