USING DIGITAL VIDEO IN INITIAL TEACHER EDUCATION

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USING DIGITAL VIDEO IN INITIAL
TEACHER
EDUCATION

Series Editor: Ian Menter

Critical Guides for
Teacher Educators

John McCullagh

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ABOUT THE SERIES EDITOR

Ian Menter is former President of BERA, 2013–2015. At Oxford University Department of Education he was Director of Professional Programmes and led the development of the Oxford Education Deanery. Before moving to Oxford, Ian was Professor of Teacher Education at the University of Glasgow. Prior to that he held posts at the University of the West of Scotland (Dean of Education and Media), London Metropolitan University (Head of School of Education), University of the West of England and the University of Gloucestershire. Ian was President of the Scottish Educational Research Association from 2005 to 2007 and chaired the Research and Development Committee of the Universities' Council for the Education of Teachers from 2008 to 2011. He is a Fellow of the Academy of Social Sciences and a Fellow of the Royal Society of Arts and is a Visiting Professor at Bath Spa University and Ulster University and an Honorary Professor at the University of Exeter. Since 2018 he has been a Senior Research Associate at Kazan Federal University, Russia.

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John McCullagh is Senior Lecturer in science education at Stranmillis University in Belfast. His research interests include the use of digital video within teacher education, particularly its use to develop pre-service teachers' confidence and competence in teaching science.

FOREWORD

Learning to teach is a complex and challenging process. In a 12-nation comparative study of teacher education systems carried out with Maria Teresa Tatto, I was able to identify six cross-cutting themes that could be used to indicate the condition of each of those systems. The sixth theme, and the one that I suggested was most speculative, was that of digitization (Menter, 2019). I suggested:

it seems that while student teachers are being encouraged to make use of IT [Information Technology] in their classrooms and in preparing to teach lessons, the adoption of electronic forms of learning for the students themselves has not been developing rapidly.

(Menter, 2019, p 276)

It is in the light of this observation that it is a great delight to be publishing John McCullagh's book, which so carefully sets out a constructive approach to the use of video in the processes of learning to teach. Over the course of several years, he has been researching and developing the use of these technologies with a view to ensuring high-quality and productive learning for pre-service teachers. In this text he is able to demonstrate the theoretical strengths of his approach as well as providing very practical guidance to those readers who seek to adopt similar methods in their own contexts.

While demonstrating the powerful learning insights that can be gained from the use of video, he also pays careful attention to the ethical and affective dimensions of the processes and procedures that he has adopted.

It has become all too apparent during the pandemic of 2020–2021 that technology-based learning of all kinds has been a lifeline for the continuation of schooling (Breslin, 2021). This is no less true in teacher education, where not only video itself but also remote meeting platforms – where video films can be aired – have been crucial in maintaining the preparation of new teachers to be ready to enter the profession.

This is therefore a great addition to our series, and John is to be congratulated for his commitment and for his scholarship, as so well represented in this book.

Ian Menter
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Emeritus Professor of Teacher Education, University of Oxford

References

Breslin, T (2021) *Lessons from Lockdown.* London: Routledge.

Menter, I (2019) The Interaction of Global and National Influences, in M T Tatto and I Menter (eds) *Knowledge, Policy and Practice in Teacher Education – A Cross-National Study.* London: Bloomsbury.

CHAPTER 1 | HOW CAN VIDEO SUPPORT LEARNING IN INITIAL TEACHER EDUCATION?

CRITICAL ISSUES

- *Why can video technology support the learning of pre-service teachers?*
- *How can video address some of the challenges of learning to teach?*
- *How should video-based activities be designed to maximise learning?*

Introduction

Digital video technology has much to offer initial teacher education (ITE), both through the technological affordances it brings to the study of teaching and from its potential to mediate the collective construction of knowledge. The powerful combination of moving images and sounds speaks to us more profoundly than any other form of media. They bring an immediacy and intimacy which draws on our capacity as humans to be moved, made curious and to reason. Video can prime us to feel involved in the action, to wonder about unfolding events, and, most importantly, it can inspire us to think and talk. Advances in digital technology and the proliferation of mobile devices allow pre-service teachers (PSTs) to meaningfully engage with practice, away from the ITE institution or school setting and at times and in places of their choice. It also provides teacher educators with the means to capture and present practice with its complexity unravelled, yet its detail and its authenticity preserved.

This introductory chapter considers the affordances of video and how it can be used to develop PSTs' understanding of teaching and develop their planning, teaching and evaluating skills. It explores how video may help teacher educators overcome the challenges presented by the complex nature of teaching and engage PSTs in meaningful, authentic learning tasks. Video, however, is only a tool for learning, and its use requires careful thought and planning. Therefore, the chapter also identifies factors which may limit the effectiveness of using video and explores the underlying principles which should underpin and guide how video-related activities should be designed.

The use of video within ITE

The facility to record, replay and analyse teachers' actions has remained the fundamental feature of using video within ITE. Sherin's (2004) historical overview describes how its aims have been shaped by teacher educators' notions of what is teaching and have shifted in line with the prevailing theoretical framework on learning. As the behaviourist view of teaching as the execution and sequencing of particular actions evolved from the late 1960s into a more cognitive model of learning in the 1980s, greater consideration was given to what teachers were *thinking* as well as how they were *behaving.* Therefore, the objectives of video use moved beyond mastering specific instructional techniques to developing PSTs' subject content knowledge and their understanding of the relationship between learning and teaching (Rich and Hannafin, 2009; Santagata et al, 2005). As video cameras became more accessible and easier to operate and the process of recording less obtrusive, the use of classroom footage grew in popularity. The increase in the quality of recordings and the ease with which they could be made now allowed for the objectification of practice and provided individuals with the means to evaluate and reflect on their teaching. Advances in digital technology and internet connectivity provide novices and experienced teachers alike access to a wider and more diverse range of teaching approaches and enable the sharing of new and alternative forms of pedagogy within and across learning communities. In this twenty-first century, Feiman-Nemser (2001) points out that reform-minded teaching, which adopts a learner-centred problem-solving approach, further shifts conceptions of teaching as *telling* and learning as *listening*, to teaching as the *eliciting* of pupils' ideas and learning as the *construction* of conceptual understanding. This form of teaching requires a more focused and nuanced approach to the interactive aspects of practice and requires teachers who are skilled in responding to the moment-by-moment needs of learners and whose thinking is both reflexive and reflective. As digital video has been shown to be an invaluable tool for the continuing professional development of in-service teachers (Baecher, 2020; Marsh and Mitchell, 2014; Martin and Siry, 2012), its use within ITE will equip PSTs with the skills and disposition to continue to explore and extend their practice throughout their teaching careers and so blur the boundary between the pre- and in-service phases of teacher education.

How can video help PSTs to learn about teaching?

The videos used in ITE can help structure PSTs' introduction to the classroom, serve as exemplars of the proficient practice of a particular teaching skill or provide them with the opportunity to observe and evaluate their own first attempts at being a teacher. The recordings can feature either the PSTs themselves or others (Figure 1.1).
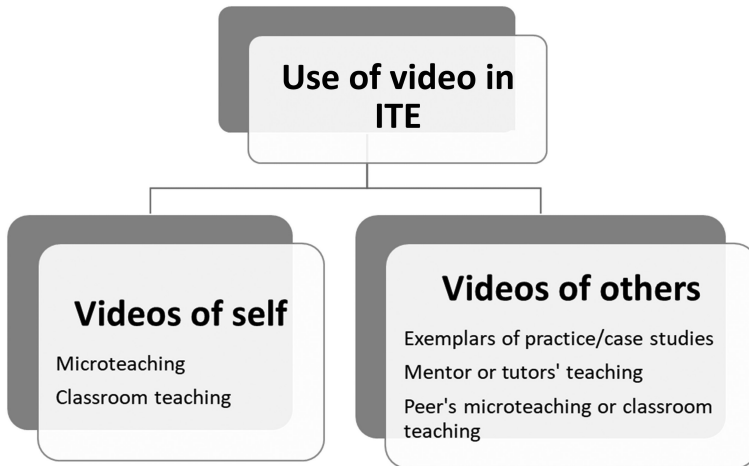
Figure 1.1 Videos can feature either the PST themselves or a teacher or peer

A number of researchers (Abell and Cennamo, 2004; Brophy, 2004; Goldman et al, 2007) have proposed that video helps PSTs to *activate* their beliefs and thinking about teaching and learning, helps them *acquire* competence and knowledge and enables them to *apply* them within a meaningful setting (Figure 1.2).

Reflection

» What activities do you use to encourage PSTs to discuss their own experience of schooling? How do you respond to their feedback?

Activate

Unlike the case in other professions, PSTs bring to their studies experiences and beliefs about teaching acquired during their own schooling. This 'apprenticeship of observation' (Lortie, 1975) has been shown to influence how PSTs think about teaching (Luft, 2001) and can be resistant to change (Luehmann, 2007). It is, therefore, important that from the very outset of their training, PSTs have the opportunity to discuss their own learning experiences and explore their existing beliefs, particularly where they may be at odds with the forms of pedagogy exemplified during the ITE programme (Bachivan and Cobern, 2016). There is also a view that acknowledging these prior experiences may identify and affirm effective forms of practice and teacher behaviours (Mewborn and Tyminski, 2006).
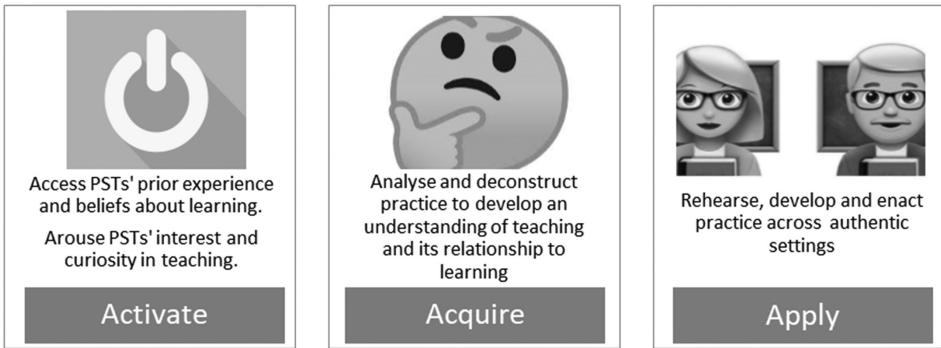
Figure 1.2 How videos can help support PSTs in learning to teach

Videos can also extend PSTs' exposure to classroom scenarios beyond their personal experience and challenge their assumptions and thinking (Yadav and Koehler, 2007). Recordings of typical classroom scenarios can be used by teacher educators to prompt memories and elicit perceptions, and, crucially, help create the supportive environment best suited for exploratory discussion (Goodman, 1988). The real and vivid nature of classroom images and sounds can engage learners and help '*create the mental context that prepares them to learn, … bring to bear relevant knowledge*, and … *make sense of subsequent instruction*' (Schwartz and Hartman, 2007, p 339). Video recordings can also be used to draw attention to the positive impact which good practice can have on pupil progress and thus inspire and motivate PSTs. Feiman-Nemser (2001, p 1017) believes that PSTs '*must also form visions of what is possible and desirable in teaching*'.

Acquire

Video recordings can conveniently transport PSTs to a range of classrooms where they can see and hear for themselves many examples of different teaching–learning scenarios. As a result, they come to witness what Marsh and Mitchell (2014, p 405) describe as

complex sets of circumstances which may be resistant to verbal representation and which in any event may be more clearly and powerfully demonstrated by 'real people in real situations' than be by the abstraction of a teacher educator at one remove from the classroom activity.

The facility to pause, replay and re-watch enables the learner to break down parts of the lesson into more learnable 'chunks' (Le Fevre, 2004). The use of shorter clips ensures that '*the often antagonistic goals of presenting complexity and making learning cognitively manageable are simultaneously achieved*' (Spiro et al, 2007, p 97). Controlling the detail and the pace with which the lesson is presented to the learner ensures that a fine-grain analysis of practice is possible without losing any sense of the overall meaning of the lesson.

Apply

Recordings of lessons can provide a real context in which PSTs can begin to plan, evaluate or offer critiques and alternative approaches to teachers' behaviours, in line with authentic scenarios. Their understanding can be road tested away from the demands of an actual classroom and with the support of tutors and peers. This proxy form of knowledge application can allow for tasks to be infused throughout all stages and levels of learner proficiency within an ITE programme and so ensure challenge and progression.

Video and skills development

A number of studies have identified how video can help PSTs become proficient in particular skills such as planning and evaluating (McCullagh et al, 2013), managing the classroom (Weber et al, 2018) and engaging pupils in the learning process (Gibbons and Farleys, 2019). Video has also been reported to enhance learners' overall understanding of classroom practice (Lofthouse and Birmingham, 2010) and their ability to reflect critically on their practice (McFadden et al, 2014; Harford and MacRuairc, 2008; Rosaen et al, 2008; Rickard et al, 2009). Stroupe and Gotwals (2018) have used video to help PSTs attempt more challenging forms of science teaching they call 'approximate ambitious instruction'. The facility to look closely and repeatedly at specific teacher actions and behaviours within an authentic and complete teaching episode highlights how individual incidents contribute to the bigger picture of the overall lesson.

Reflection

»   How do you help PSTs to understand the relationship between teaching and learning?

The challenging nature of learning how to teach

Digital video can be used to help address three fundamental challenges which PSTs confront when learning how to teach. Firstly, teaching may seem easy and straightforward, with the craft, wisdom and skill of the teacher remaining invisible to the untrained idea. The often-tacit and multi-faceted nature of the teacher's knowledge and skill can make it difficult for PSTs to see and appreciate what they should be attending to during their observation of

a lesson. Secondly, teaching is highly complex, described by Spiro et al. (2007, p 93) as an ill-structured domain, '*in which the instances of knowledge application are both individually complex and in irregular relationship to each other*'. Teaching scenarios develop from minute to minute and vary widely across settings, and so it is not possible for the teacher to have a '*pre-packaged prescription*' (Spiro et al 2007, p 93) of what to think or how to act in all circumstances. Teacher educators are therefore tasked with deconstructing practice and presenting it in an accessible form.

Finally, there is the issue that the practice element of the ITE programme usually takes place in a different setting away from the support of tutors and peers and often occurs asynchronous to the study of related theory. Any differences in the priorities, resources and educational culture of both learning sites and the limited opportunity for collaboration and discussion may restrict PSTs' opportunities to connect theory to practice, explore alternative teaching approaches and make for a less-than-gentle and supportive induction into the profession. As placement may well be the learner's first encounter with pupils, it is the point at which they need the most support, guidance and reassurance. Grossman and McDonald (2008, p 189) raise the question of why '*university-based teacher educators leave the development of pedagogical skill in the interactive aspects of teaching almost entirely to field experiences, the component of professional education over which we have the least control*'. They also point out that tasks requiring PSTs to begin to apply their knowledge and understanding are usually limited to planning or evaluating, with actual interactive teaching rarely included. Therefore, ITE programmes should provide opportunities for learners to attempt interactive teaching within the controlled scenarios of reduced complexity.

Reflections

» How do you first introduce classroom teaching to PSTs at the beginning of ITE?
» What informs and guides your approach?

Using video to introduce and develop practice

Video-supported learning activities can help overcome the challenges identified earlier regarding the development of PSTs' understanding and enactment of practice. Grossman et al's (2009) study of training programmes for professional practices related to '*human improvement*' (p 2057), such as teaching, clergy and clinical psychology, have identified three key concepts for understanding the pedagogies of practice in professional education: *representations, deconstructions* and *approximations of practice*. Representations of practice refer to activities which make practice explicit and learners more mindful of its elements. Deconstruction of practice breaks it down into smaller units of action and thought, while approximations of practice covers involve activities which take place away from the professional setting. Table 1.1 shows examples of activities relating to each concept and their benefits.

Table 1.1 Examples and benefits of video-based activities for Grossman's (2009) three pedagogies of practice

Video-supported activity	Benefits to PSTs
Representations of practice scaffolded by • Viewing and discussing exemplar lessons. • Viewing videos from a diverse range of classrooms and teaching scenarios. • Viewing videos representing case studies. • Recording videos of personal practice for inclusion in e-portfolios.	• Presents detail and allows for tutor commentary and explanation. • Extends PSTs' experience and enables them to identify patterns and establish key principles of practice. • Facilitates a problem-based approach to learning. • Enables PSTs to see and evidence their attainment and recognise progression in their practice, thereby nurturing professional agency.
Deconstruction of practice assisted through • Pausing of video at key moments in the lesson. • Slowing down or replaying parts of the video recording. • PSTs annotating the video with comments or responses to prompts or questions. • Video editing tasks to identify and select specific aspects of practice.	• Allows for the lesson to be broken down and analysed through open discussion. Observation skills can be extended by freezing the frame and sharing interpretations. • The detailed nature of fast-moving events is revealed, and PSTs become attuned to what they may have failed to notice. • Transforms the role of PST from passive viewer to active learner. Annotations and responses enable tutors to access and challenge PST thinking. • Editing requires close viewing of the same clip several times and draws closer attention to pupil or teacher behaviours.
Approximation of practice enacted during • Microteaching. • Video recording of pairs or small teams of PSTs teaching lessons to small groups of pupils. • Drafting lesson plans based on their viewing of video recordings of lessons. • Creating and sharing evidence-based evaluations of video recordings of lessons.	• Provides PSTs with their first experiences of planning, teaching and evaluating in a controlled and supportive setting. • Allows for the transfer and consolidation of learning from microteaching into a more authentic and challenging situation. Video analysis can identify improvement in practice from microteaching and thus provide reassurance and develop confidence. This further develops agency and vindicates reflection as a tool for development. • Video recordings of lessons provide the framework around which PSTs can create written accounts of practice and develop the ability to envisage how written lesson plans might look like in the classroom and how intended practice may be accurately represented in lesson plans. • Develops PSTs awareness of what and where to look for regarding evaluation. Collaboration with peers and tutors requires assertions to be evidence-based.

Reflection

» What issues have restricted your use of video?

Attending to the limitations of video

While video can serve as a considerable aid to PSTs, it is worth considering the factors which could potentially limit its value and how they may be overcome. Erickson (2007) points out that viewers are accustomed to watching a video which has been carefully edited and designed to infer meaning, and less used to watching longer clips of unedited footage. What is shown in the video is limited to the particular camera angle and focus, and so the viewer is not able to make decisions about where to look and what to attend to as the lesson unfolds. It is this limitation which prompted Gardner and McNally (1995) to contend that video could be no substitute for the live classroom experience. The viewer is also not party to any conversations or events off-camera which the recording may miss, yet which may have guided the teacher's decisions and actions. With this in mind, Fadde and Zhou (2015) observe that teachers' own stand-alone recordings can be less useful than professionally edited recordings despite being more 'natural'. However, acknowledging and discussing this '*video conundrum*' (p 201) with PSTs can cause them to engage more critically with video-based classroom analysis and pay closer attention to how they might make their own recordings. The use of two cameras to record the lesson from different angles, for example from both the front and back of the classroom, allows the viewer to see the lesson from the perspective of both teacher and pupils. Some video playback software such as iMovie allows for split-screen presentation, providing the viewer with the unique opportunity to see how pupils react (or not!) to the actions of the teacher and how the teacher responds. (Muting the audio playback on one recording avoids the need for synchronising both recording devices.)

The content of edited video is controlled by what the editor considered to be important and may exclude classroom footage which others may have found useful or interesting. It can also be difficult to acquire a sense of the duration of the various parts of the lesson. Providing additional information about the context of the lesson, such as how the lesson fits into the topic or scheme of work, the ability range of pupils or the teacher's expectations for the lesson (Shwartz and Hartman, 2007) helps the learner to connect and compare the specific events they see and hear in the recording to wider issues and principles of education. Valuable additions to video recordings can include the following.

» *Hyperlinks* – These may be inserted into the video, linking to texts which provide background information to the lesson, lesson plans, worksheets, etc.

» *On-screen prompts or questions* – Annotations can be added on-screen or tagged by time markers to a text box below the screen. Spiro et al (2007, p 95) go as far as using sound effects booming, '*it's not that simple, look again*!' at particular parts of the video which are then re-played to draw viewers' attention and encourage them to reappraise the situation. They take the view that '*habits of mind are hard to change. Video affords ways to catch people's eye and to call attention to the often unconscious assumptions they are making*' (p 95).

» *Commentary* – The tutor can record a narration (for example, an explanation of what is happening in the video, how it relates to theory, alternative teacher actions), or the teacher featured in the video could share their perspective on the lesson (aims, objectives, previous or follow-up lessons, evaluation). This can provide an otherwise-missing insight into the teacher's thinking (Richardson and Kyle, 1999). Teacher evaluation could also be added as a separate audio or video file.

Planning video-based activities

Video is, however, only a tool for learning (van Es et al, 2015), and the overall benefit to PSTs depends on how activities are planned and facilitated (Tekkumru-Kisa and Stein, 2017). Most studies of the use of video in teacher education have focussed on the outcomes for teachers and PSTs, with only limited research into the pedagogy of its use (Blomberg et al, 2014). Blomberg et al (2013) identify five key principles which should guide the planning of video-based learning activities. Planning should identify a clear learning goal or goals and adopt an instructional approach in line with the desired outcome. In designing the activity, instructors should carefully consider their choice of video content and consider what additional material may be useful to learners. They recommend that the form of assessment should enable the learner to clearly demonstrate their attainment of the particular learning objective. Table 1.2 suggests how each of Blomberg et al's (2013) principles could be addressed when designing activities.

Table 1.2 Examples of how each of Blomberg's (2013) principles for guiding the use of video might inform the choice and design of related tasks

Considerations for designing a video activity	Examples
Identify learning goals	• Access and explore PSTs' perceptions of 'good' teaching. • Develop particular skills, for example planning, evaluating, asking questions, providing feedback, introducing lessons, managing transitions within or between lessons, organising group work, managing resources. • Develop PSTs' awareness of strengths and areas of development in their practice. • Develop PSTs' ability to reflect on and modify their practice. • Develop PSTs' subject knowledge and subject pedagogical content knowledge via video clips of the teaching of progressively more difficult concepts within a topic.
Align instructional approach to learning goal(s)	• Instructional approach can adopt either a cognitive (scaffolded and structured) or situated (detailed and open-ended) approach to learning). • The design may challenge PSTs to engage individually or in groups, with the task of observation, teaching or reflecting.
Acknowledge and mitigate against limits of video	• Challenge PSTs to declare 'what other information would be useful to know about this situation?' • Provide contextual information orally, on the screen or as additional documents. • Invite PSTs to suggest which additional footage or camera shots would be worth viewing.
Choose appropriate video content	• Exemplar videos are useful for characterising best practices. A range of settings allow general principles of theory to emerge. • Unedited videos of the lesson allow for a more nuanced critique, provide wider scope for discussion and can draw PSTs to question assumptions or challenge aspects of the practice. • Footage of self and peers can provide affirmation and reassurance and so enhance confidence.
Base assessment on evidence of goal attainment	• Assessment task could require editing and annotating a video. • Video of personal teaching alongside reflective annotations or written evaluations could evidence attainment of competences.

A similar framework for designing tasks is proposed by Tekkumru-Kisa and Stein (2017), who also pay particular attention to the role of the facilitator before and during the activity. By anticipating any events in the video which may be a source of surprise or disagreement, the facilitator can contemplate how best to manage and direct the discourse. Facilitators should also closely monitor group discussions and respond where appropriate to clarify,

redirect, counter or validate opinions and use PSTs' comments to progress thinking and build understanding.

IN A **NUTSHELL**

Digital video can serve as an invaluable learning aid to PSTs because video recordings can present and preserve the full detail of the classroom and digital technology can facilitate rich learning activities. It can capture practice, provide a means for its analysis and empower learners to evaluate their progress. However, instructors must understand how to ensure that PSTs' attention is drawn to relevant information and that they are supported in their construction of new knowledge and not distracted or overwhelmed. To maximise learning, video-based activities should adopt appropriate instructional designs, select suitable video content and employ meaningful assessment methods in line with clear learning objectives.

REFLECTIONS ON **CRITICAL ISSUES**

- *Video technology can help PSTs' learning by providing authentic examples of teaching which they can discuss and analyse alongside guidance from tutors and in-service teachers. Digital technology enables classroom footage to be viewed alongside supporting text, which can direct the learner's attention and provide context further insight.*

- *Learning to teach is difficult as the skill and knowledge behind a teacher's classroom practice require exposition and structured explanation. Video technology allows for this to take place in and away from the classroom. The realness of video recordings can stimulate the discussion of teaching between PSTs and tutors and cause them to reflect on their own notions and pre-conceptions about learning.*

- *Video is a useful tool, but the efficacy of related tasks depends on the careful consideration of the learning goals, the role of the instructor and the use of appropriate video recordings and supporting artefacts.*