USING VIDEO ANALYSIS SOFTWARE TO CREATE INNOVATIVE TEACHER PROFESSIONAL DEVELOPMENT

Susan Bolt, Rosemary Kerr and Verona Wauchope
Curtin University
Australia

Abstract

This paper describes a practical application of video analysis software for the purposes of teacher professional development in a large public Australian university. The current research builds on previous research into the practices of effective literacy teachers, notable for its focus on what quality teachers actually do in the classroom to enhance learning rather than what research indicates they should do (Louden et al., 2005). In this paper, the researchers describe their initial experiences using the video analysis software and highlight its potential as a tool for teacher professional development.

Introduction

Anita Roddick (n.d.), the activist, business woman and founder of *The Body Shop* proclaimed, "If you do things well do them better. Be daring, be first, be different, be just." Interestingly this statement is poignantly relevant to teacher professional development in higher education. The interpretive research described in this paper is aimed at identifying and exemplifying quality teaching practices in an Australian university Business School. Accordingly, the aim of the researchers and participants is to improve the quality of teaching — to do what they do well, better. Being daring, the researchers and participants have taken up the challenge of integrating technology into teaching and learning research, and professional development. The researchers are the first to investigate the applicability of the Classroom Literacy Observation Schedule (CLOS) in a higher education setting (Louden et al., 2005). Previous research in which the CLOS was developed was different in that it emerged from a study of what teachers actually do rather than from theories about what teachers should do (Louden, et al., 2005). The current research crosses the boundaries between teaching in the early years and in higher education; it acknowledges that although the teaching contexts are different there may be some common dimensions observable in the behaviours of good teachers. This research is just; it promotes reflective practice, provides teachers with feedback and, by using video technology to exemplify good teaching practices, teachers may learn from each other. The research methodology adopted by the authors was rigorous and participation was voluntary.

In this research teachers volunteered to have their teaching videoed; after which they received feedback on their teaching using a peer review of teaching process. Video data were collected and then analysed using Artichoke video analysis software (Fetherston, 2010). Further methodological aspects of data collection and analysis are described later in this paper. In the following section a brief overview of the research on which this study is based is provided.

Literature Review

This study draws from previous research in which a Classroom Literacy Observation Schedule (CLOS) was developed and used to identify effective teaching practices in the early years of schooling (Louden et al., 2005). The *In Teachers' Hands* project for which CLOS was developed investigated the link between children's development in English literacy in the early years of schooling and their teachers' classroom teaching practice. In the 2005 Louden et al. research project a comprehensive review of literature identified 33 teaching practices which were grouped into six dimensions to form the CLOS. The six dimensions — participation, knowledge, orchestration, support, differentiation and respect — were used to analyse teachers' practice (Louden et al., 2005).

Evidence of a strong linear relationship between effective teaching practice and improved growth in literacy motivated Louden et al. (2005) to expand on the CLOS and build on the previous research. A revised Classroom Literacy Observation Schedule (CLOS-R) was developed for the *Teaching for Growth* study (Louden et al., 2008). The CLOS-R contains 27 teaching practices in five dimensions: knowledge, orchestration, support, differentiation, and respect. These dimensions and practices were developed as a result of extensive use of the CLOS in the analysis of the teacher practices observed in the earlier 2005 study.

The Louden et al. studies (2005; 2008) while situated in the Australian literacy education context were informed by such studies as Wray, Medwell, Fox, and Poulson, (2000) which assessed the teaching practices of effective literacy teachers in the United Kingdom and described their characteristics and behaviours. It also drew on the work of Hattie (2003) which identified five major dimensions of expert teaching from the synthesis of 500,000 studies. Teacher effectiveness was the focus of many of the studies; however, the identification and description of teaching practices and dimensions within these studies used to create the CLOS and CLOS-R has also provided practical descriptions of what teachers do in the class room context. The CLOS and CLOS-R informed the development of the teaching observation schedule used for observing higher education teaching in the current study (the BTOS, briefly discussed below). The current study acknowledges the influence of Chickering and Gamson's (1987) seven principles for good undergraduate teaching practice in the higher education context but these principles are very broad and this study aims to identify, in detail, teaching practices and dimensions in the business higher education context.

The observation phases of both the Louden et al. 2005 and 2008 studies involved non-participant observations of the teachers selected to participate in the study. A two person research team observed literacy teaching for two-four days. Five types of records for analysis were produced as a result of the observations including written anecdotes*, in situ* provisional scoring of episodes, audio recordings, video recordings with sound and a recording of the teacher interview subsequent to observations. The two hours of teaching selected from the preliminary research analysis as representative of effective teaching was loaded into the video data analysis software for analysis. Each episode was then categorised under different dimensions and coded into one or more of the teaching practices identified in the CLOS or CLOS-R. The Louden et al. 2008 study used Artichoke computer software to analyse the video data. The successful use of this software in prior studies prompted the current researchers to adopt this software for the video analysis of the business teaching observations.

Another study, reported in *Teaching for Growth* (Louden et.al., 2008), that built on the experience of developing the CLOS-R involved the development of the Teaching of Mathematics Observation Schedule (ToMOS). ToMOS was developed in response to the need for an instrument to measure teaching quality in lower secondary mathematics classrooms. In the development of items for the ToMOS literature was reviewed to highlight teaching practices in a lower secondary mathematics setting which could be observed in "public time." Public time as opposed to private time was defined as when the student and teacher are involved in public (rather than private) interaction. The observable characteristics of quality numeracy teaching, observed in public time, were organised into ten themes including: choice of task, student thinking, consolidation, feedback, systematic development of content, making connections and direct teaching language. These were then categorised into two dimensions: 1.) Communicates Expectations, and 2.) Focuses on Conceptual Understanding (Louden et al., 2008). In contrast to the literacy research, the use of video was not an integral part of the data collection rather it was used to clarify differences in *in situ* observations noted in the ToMOS document. The successful use of *in situ* observation schedules in this study has informed the current study.

There are interesting comparisons to be made between the previous research and the current research. For example, the exemplification of 'good teaching' is common to the past and present research projects. However, in the current research the authors were unable to identify 'effective teachers' using the same procedures as the Louden et al. (2005) study; this approach was not suitable for use in higher education. In the current research the authors recognised that teaching could occur 'in public' or in 'private'; similar to the Louden et al., (2008) study. A key difference between the current research and the previous research is the focus on professional development. The authors embedded the current research within a peer review of teaching process based on adult learning principles and established peer observation partnership procedures (Atkinson & Bolt, 2010; Bell, 2001, 2002, 2005; Knowles, Holton III, & Swanson, 2005).

Research Methodology

The purpose of this study was to test the applicability of the CLOS/(-R) frameworks and to identify and exemplify effective teaching practices in a higher education business school setting. The researchers collected data through a focus group, video with sound recorded teaching observations, semi-structured interviews, and field notes generated through the peer review of teaching and data analysis processes. In the focus group, academics responded to questions and discussed issues which enabled the researchers to adapt the CLOS/(-R) to a higher education setting. As a result the researchers developed a Business Teaching Observation Schedule (BTOS) which they used to provide feedback to participants and code teaching practices. The BTOS included most of the CLOS dimensions; BTOS differed in that 'orchestration' was changed to 'delivery' and a seventh category, 'other,' was included. In addition to this there is significant variation in the teaching practices identified in the CLOS and BTOS. A comparison of these research projects reveals an interesting progression of teaching practices in the early and middle years of schooling, through to university. To ensure consistency and reliability, the researchers established common understandings about the identification of the BTOS codes through a consensus moderation process and established a set of procedures that guided data entry and analysis. The researchers documented their discussions using Livescribe which is a "paper-based computer in the form of a pen that records everything you hear and write" (Livescribe Smartpen User Guide, 2010, p.1); thus they were able to return to previous conversations to clarify their understandings and maintain a consistent approach.

Whilst there are many aspects of this research that could be described, the focus in this paper is on the researchers' initial experiences using the video analysis software, Artichoke (Fetherston, 2010). The three researchers were experienced academics but the Artichoke software was novel to all of them. The software developer, an academic at a neighbouring university, trained the researchers to use Artichoke and provided them with ongoing coaching via telephone, email, and face to face mentoring which was also recorded using Livescribe. The discussion in this paper is focused on one 'test' case that the researchers used to establish common approaches to inputting and analysing video data. Using this case the researchers became familiar with Artichoke and established procedures for using it with the aim of assessing the software's applicability to providing annotated video of exemplary teaching practices. The resultant procedures ensured consistency as the researchers worked with other cases. Additionally, these procedures may facilitate the replication of the research in other higher education contexts.

Findings in relation to the applicability of CLOS/(-R) and the identification of effective teaching practices in a higher education setting will be discussed in future papers. In relation to the researchers' initial experiences with Artichoke, the key finding was the need for and development of an organic approach that

allowed the researchers to reflect on a teaching situation as a 'whole,' in its 'parts' and then again as a 'whole'(Senge, Scharmer, Jaworski, & Flowers, 2005). The resultant procedures and the researchers' experiences using Artichoke are described in the following sections.

Procedures to Analyse Teaching Practices

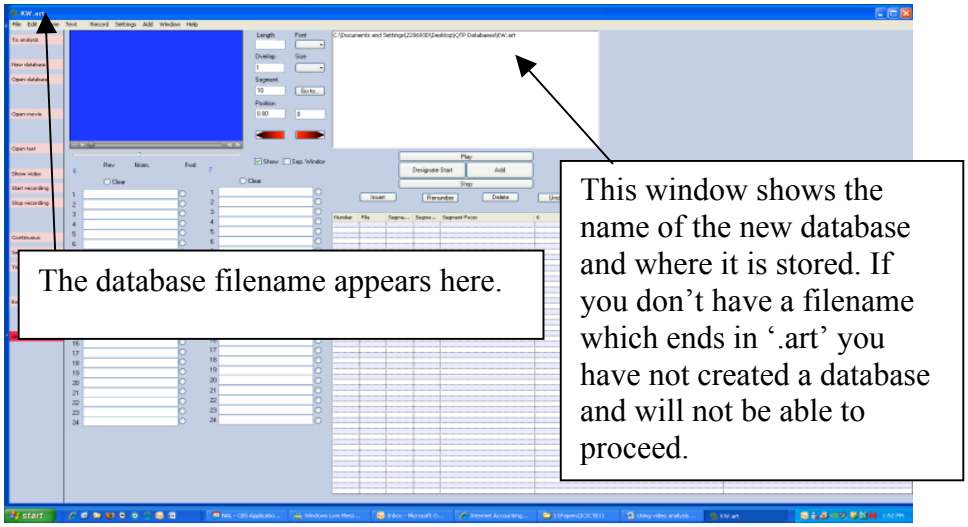
In qualitative research, data analysis commences at the onset of data collection (Cavana, Delahaye, & Sekaran, 2001). In the current research data collection began with the observation of a teaching session during which the observer took field notes and used a matrix to record observations. When peer review of teaching occurred in conjunction with the research, the teacher and the observer also reflected on the teaching session and completed a pro forma based on the overarching dimensions of the BTOS. Following this the observer and the teacher discussed their reflections.

As a group, the researchers used the field notes and observation matrix to develop a systematic analysis framework to identify teaching episodes such as group work or whole class teaching. Because the teaching sessions were complex and varied in length the researchers chose to identify representative samples of teaching episodes, with a total duration of thirty minutes. Once this was done, the researchers used Artichoke to assist with data analysis. Even so, the researchers recognised that programs like Artichoke were computer-assisted tools that could help them code and categorise data, but, ultimately, they relied on their own analytical capabilities (Cavana et al., 2001; Creswell, 2008; Yin, 2009).

Using Artichoke: Inputting Video Data

While Artichoke is not particularly intuitive software it is relatively easy to learn to use and inputting video data is quite straightforward. Artichoke uses QuickTime which requires the video data also to be formatted to QuickTime. Artichoke cannot access videos stored on the CD drive (Fetherston, 2010). The researchers stored the video data on a restricted access shared drive, so the data were secure but accessible to the researchers. To create an Artichoke database the researchers opened Artichoke in the "input" window and selected "new database." Figure 1 shows a screen capture of a new database. Initially, the researchers also stored the Artichoke databases on the restricted access shared drive but they encountered problems saving their analyses if the server was slow. To overcome this issue the researchers saved the databases on their computer desktops.

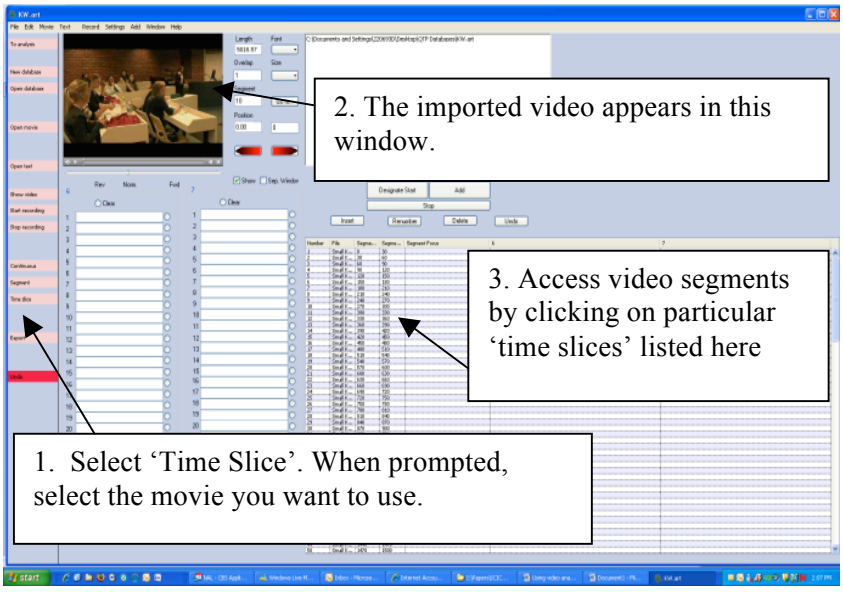
Figure 1: Artichoke screen capture showing the start of a new database



(Adapted from *Artichoke*, Fetherston, 2010)

After creating a new database the video to analyse must be imported. The researchers had most success importing a video by clicking on "time slice" then selecting a video from its stored location. Artichoke then imported the video into the database (see Figure 2 which shows this step). Having inputted the data, the researchers were then able to proceed to the "analysis" window in Artichoke (Fetherston, 2010).

Figure 2: Importing a video into a new database using Artichoke

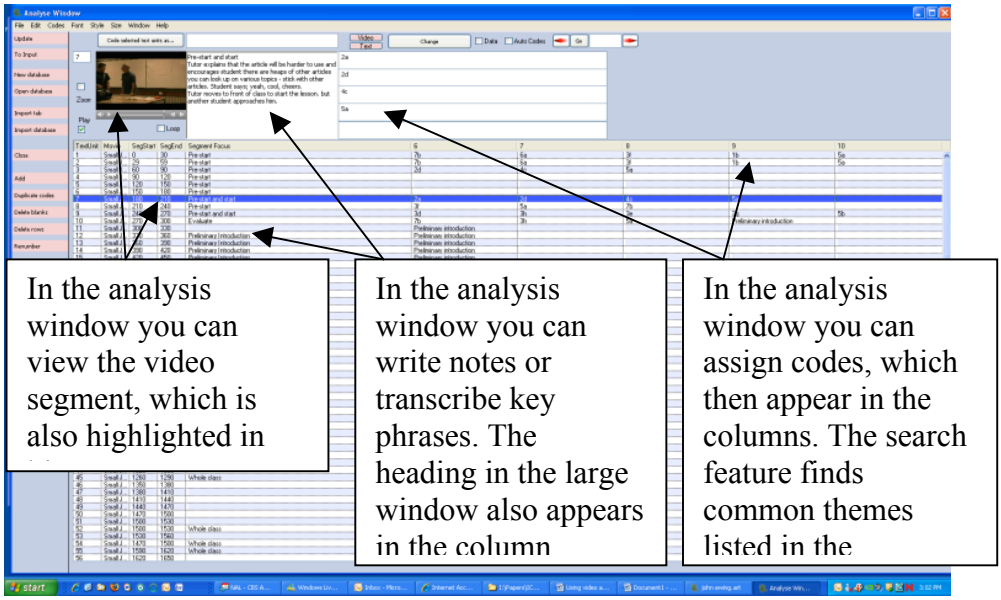


(Adapted from *Artichoke*, Fetherston, 2010)

Using Artichoke: Data Analysis

In the data analysis the researchers observed the videoed teaching observation session and assigned the BTOS codes to identify specific teaching practices. The researchers initially wrote the names of the codes in the designated columns but to speed the analysis process decided to assign a numeric value to each code. The software developer later stated that either method was appropriate. Also, the researchers quickly learned to save their work by clicking on "change." Figure 3 shows how the researchers used Artichoke to annotate and code video data.

Figure 3: Annotating and coding data using the analysis window of Artichoke



(Adapted from *Artichoke*, Fetherston, 2010)

As the researchers annotated and coded the video data they realised that teachers demonstrated several codes simultaneously and the initial 'mechanistic' approach they had adopted to slice and code teaching practices was inappropriate. They needed to adopt a more 'organic' approach and their consideration of 'whole, part, whole' took on a new perspective so the researchers revised their procedures to incorporate this approach (Senge et al., 2005).

Discussion

The three components of Artichoke — input, analysis and reflection — facilitate data entry, coding, and analysis. Also, teachers can use Artichoke for reflection. Although the Artichoke software was designed for dealing with video for educational purposes it can be used in other situations and purposes (Fetherston, 2010). For example, interviews recorded using Livescribe technology can be imported into Artichoke and analysed without having to be transcribed.

Artichoke creates a highly interactive digital video environment making it well suited to the detailed analysis of teaching practices. While only one video was analysed as the test case for the usability study, it is clear that the flexibility in time slicing into user-determined timeframes make it an appropriate video annotation system. Time segments could be selected according to the level of detail to be analysed, for example a teaching event of ten minutes could then be sectioned into 30 second slices. Selected time segments could be played repeatedly which facilitated the researchers' discussions about creating a common understanding of the teaching dimension codes in the BTOS. The software has a 'copy and paste' capacity which allows the entry of analysis codes multiple times in consecutive time slices. The occurrence of consecutive coding for 30 second time slices prompted the researchers to reconsider their method and adopt the 'whole, part, whole' (Senge et al., 2005) approach. This approach also allows data collected from the *in situ* observation to inform the video analysis. Artichoke has reporting systems that have only been briefly explored by the researchers but early experience indicates that reports, such as frequency of codes indicated by percent, could facilitate identifying video segments of exemplary teaching. Artichoke allows segments of video to be exported to create new short videos. This was a simple process and will be essential for the creation of the web-based videos for teacher professional development.

Conclusion

Further refining the analysis process of the video data will be an iterative process, using Senge et al.'s (2005) "whole, part, whole" approach. However, the Artichoke software has proved to be flexible enough and user friendly enough to be a tool to facilitate the overarching aims of the research project. The software allows the detailed analysis of identified teaching dimensions to create video vignettes for teacher professional development in the business higher education context. The software features of time slicing and aspects of the reporting systems will assist the identification of examples of teaching practice. These video segments can then be exported to create easily accessed short videos to be used for teaching professional development. The use of video will allow teacher professional development to go beyond the prevailing model of describing what teachers can and should do to also showing them what it looks like situated in their university teaching spaces.

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