

Using a wide array of evidence (student work samples, instructional materials, planning, video of practices), as opposed to only student achievement, teacher educators and preservice teachers can systematically center their attention on the fine-grained attributes of process or outcomes. Evidence of teacher practice and student learning is much more expansive and more powerful than currently acknowledged.

Second, the manner in which evidence is interpreted is critical to preservice teachers engaging in a process that will help generate clear explanations of deficiency and success. We use a metaphor of lenses to explain this interpretive process. To overcome issues of recollection and personal interpretation, raters and practitioners need access to instruments that help amplify fine-grain attributes of practice and suppress noise. Teaching and learning is so complex it is difficult for the novice to see what constitutes success without tools (lenses) that help them decompose the events.

Finally, existing technologies provide affordances to systematically collect and codify evidence of one's own or others' practices. Metadata generated from the codification enables the video of practices, for example, to become reusable objects (a two-minute clip of an exemplary strategy) for teaching and learning. Technology integration to support student learning of fractions, for example, can be shown to teachers in a concrete manner. Fully, the technology-based support mechanisms and the processes they support must be extensible across all domains to be widely implemented in a college of education.

An evidence-based support tool

Here at the University of Georgia's Learning and Performance Support Laboratory (<http://lpsl.coe.uga.edu>), we are developing a web-based video capture and coding tool called the Video Analysis Tool (VAT).

The VAT is a Web-based program that provides users the capability to remotely upload live and pre-recorded video. Users can then analyze video evidence as part of a self-assessment, collaborative assessment (e.g., with a mentor or peer), or observation by a rater as an effort to define specific needs for support in order to encourage growth. The tool provides for individual or multi-user analysis of the same video using the same or different assessment instruments (See <http://vat.uga.edu/> for more complete descriptions and samples of the capture and coding technology.).

Teaching and learning evidence is recorded through video cameras either via live, real-time capture, or post-event upload and stored on the VAT server for subsequent review or analysis. Internet Protocol (IP) video cameras have a built-in FTP (file transfer protocol) and Web-server capabilities, enabling remote configuration and control of the video content.

During live capture, IP video cameras are pre-installed, passing video streams to a server which records the video streams, enabling a rater to observe practices remotely with minimal classroom disruption or interference.

Post-event upload refers to archiving video files on the VAT server subsequent to recording a practice. VAT users can videotape an event and subsequently digitize and upload the converted files to the server. While increasing the time and effort required to capture evidence, post-event uploading provides additional backup in the event of network or data-transfer failures.

Video analysis enables users to codify key practices. They can view a video of specific events and segment it into smaller sessions of specific interest. Refined sessions, called VAT clips, provide raters granular performance evidence to observe and reflect without the 'noise' or 'interference' of extraneous events. The rater accesses captured practice from a standard computer using the VAT toolkit. Through *create video clips*, initial video segmenting takes place, providing markers as reminders of where target practices might be examined more deeply. Following initial live observation or during post-event review, the user accesses the *refine clips* tool to make further passes at each segment to define specific, finer-grained activities.

During refinement, the user defines clips associated with their interests, such as specific activities, benchmarks or quality rubrics. The user designates, annotates and certifies specific clips as evidence associated with a target practice. Marked-up, performance objects can then be accessed and viewed by either a single individual or across multiple users accessing the *view my clips* tool, providing the capability to examine closely the performance of a single individual across multiple events or multiple individuals across single events.

VAT in our college of education

Through the support of the LPSL's federally funded E-TEACH project, we have been implementing iterative cycles of research and development centered on evidence-based methods and tools. Since 2003 VAT, as an

instantiation of systematic evidence collection and interpretation, has been evolving as a support mechanism for preservice teacher growth in teacher preparation in our college of education.

Our work in teacher preparation includes collaboration with multiple departments including science, math, elementary, and special education – each at various levels and for different purposes. Faculty use VAT to provide on-demand support to student teachers in remote locations. The tool can be seamlessly integrated into courses as a teaching tool. Examples of practices captured on video can be aligned to national standards, state frameworks, or programmatic outcomes and shown to illustrate success.

Clearly, the fine-grained attributes can be amplified and shown to the preparing teachers, even compared to their own practices. Preservice teachers use VAT for self-assessment. They can capture their own teaching, students learning, and others' practice with clear purpose – to define areas of growth and needs for support. Faculty supervisors use the tool to remotely observe and assess preservice teacher practices to support growth. Cooperating teachers also use VAT to collaboratively assess preservice practices and assess their own mentoring practices. Thus far, VAT has been versatile in supporting programmatic variations.

Future efforts

Using technologies ranging from camcorders to Internet-based video analysis tools, teacher educators and preservice teachers are able to support systematic processes for assessing self and others' practices. Clearly, faculty and mentors have demonstrated the utility of manipulating evidence extracted directly from the teaching and learning environments. Our goal is to continue this collaboration and further develop methods and tools to use a wider array of evidence and an iterative process that can be fully implemented and sustained in all programs.

Parts of this article were excerpted from the book, *Integrating Technology into Teaching: The Technology and Learning Continuum Model* by Art Recesso and Chandra Orrill (Houghton Mifflin, scheduled release spring 2007).

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