

RESEARCH INTERESTS

My research interests and post-tenure output organize around two general themes: 1) training of intuitive expertise and 2) instructional design and technology, especially online learning, video in education and training.

Training of Intuitive Expertise

My case for promotion largely lies in the articulation and application of *Expertise-Based Training* (XBT) as an instructional design theory that adapts the representative tasks used in expert-novice research studies as a way to train aspects of expert performance that can appear, to performers as well as observers, to be intuitive. In many contexts, expert performers are able to make good, fast, and largely subconscious decisions that lead to rapid actions. My focus is on recognition-based anticipation during performances that range from baseball batting to classroom teaching (two areas where I have used XBT to ground training interventions).

XBT posits that the *recognition* component of intuitive decision-making can be isolated from strategic or psychomotor outputs for targeted and efficient training. The design of training tasks aimed at improving skills such as pattern recognition and situation awareness is inspired by the representative tasks used in expert-novice research studies. Typically, experts and novices complete a task that is related to real performance but that can be done in the research laboratory and is readily observable, measureable, and repeatable. The same attributes can be achieved in instruction by repurposing expert-novice research tasks as relatively simple (compared to simulators) training tasks that can be done using computer-based training (CBT).

My patent-pending design for computer-based pitch recognition training for baseball batters has been licensed by SIUC to Axon Sports for production of an iPad application (<https://itunes.apple.com/us/app/axon-athletic-brain-trainer/id543764969?mt=8>). I have consulted with several college and professional baseball teams on pitch recognition training programs that combine computer-based training with “live” batting cage drills.

It has been particularly gratifying, though, to apply the XBT approach to video-based recognition training in teacher education. I believe that classroom video provides pre-service and in-service teachers with a rich opportunity for accelerating teacher expertise. “Do You See What I See? Using Interactive Video to Develop Pre-service Teachers’ Classroom Awareness” (*Contemporary Issues in Technology and Teacher Education*) offers new ways of using classroom video in teacher education. The research project involved pre-service teachers critically observing the classroom teaching of other novice teachers (near peers) and comparing their observations with those of experienced teacher educators. This XBT activity allows early pre-service teachers to start building their classroom *noticing* skills separate from and in advance of actual classroom teaching performance and thereby accelerate their acquisition of teacher expertise.

First articulated in an article titled “Expertise-based Training: Getting More Learners Over the Bar in Less Time” (*Technology, Instruction, Cognition, and Learning Journal*), the full range of XBT’s applicability is best demonstrated through juried proceedings papers for Inter-service/Industry Training, Simulation, and Education Conference (I/ITSEC), the world’s largest military simulation conference:

- “Look 'Ma, No Hands: Part-Task Training of Perceptual-Cognitive Skills to Accelerate Psychomotor Expertise,” presented at I/ITSEC 2010, and selected as the Education Committee's Best Paper, applies XBT to recognition training in performances such as use-of-force and vehicle operation.
- “What’s Wrong with this Picture? Video-Annotation with Expert-model Feedback as a Method of Accelerating Novices’ Situation Awareness” (I/ITSEC 2012) reports on applying the XBT approach to recognition training in the entirely different performance area of classroom teaching.
- “Accelerating the Acquisition of Intuitive Decision-Making through Expertise-Based Training (XBT),” under final review for I/ITSEC 2013, represents the most recent and complete development of XBT.

XBT to accelerate expertise is not limited to technology-delivered training, as demonstrated in two articles co-written with Gary Klein, who is considered the originator of naturalistic decision-making theory. One article appeared in a special issue of *Cognitive Technology* on accelerated learning and the other in a human performance improvement journal. “Accelerating Expertise Using Action Learning Activities” and “Deliberate Performance: Accelerating Expertise in Natural Settings” describe practical activities that working professionals can engage in during the course of their routine job performance in order to sharpen their situation awareness and self-awareness and thereby build the tacit knowledge that underlies intuitive expertise.

Instructional Design and Technology

Synchronous online instruction has become a research interest as I have incorporated live virtual classrooms (*Adobe Connect*) into my own teaching of graduate instructional design and technology courses. In particular, the blending of synchronous and asynchronous online learning offers opportunities for innovative pedagogy and research. Online learning research articles that I’ve co-authored include “When to Talk, When to Chat: Student Interactions in Live Virtual Classrooms” and “Traits of Effective Instructors in an Online Setting.” A chapter on “Blended Online Learning: Benefits, Challenges, and Misconceptions” has been accepted for a forthcoming book about online learning.

Video for education and training has been both a professional interest, having worked for 20-plus years as a video producer, and also an academic research interest. As argued in an *Educause Quarterly* article titled “Cool and Credible Web Video: Old rules, No rules, or New Rules?” video has been de-professionalized, but teachers and trainers who understand video can use it to project either “professional” credibility or new-media savvy, depending on the audience and purpose. A co-authored article titled “Guerrilla Video: Adjudicating the Credible and the Cool” explores rhetorical implications of video aesthetics, and how these become part of the language and tools of a professional communicator.

The role of classroom video recording in teacher education and professional development has expanded with the introduction of high-stakes assessment that includes video evidence of classroom performance. Initiatives such as Teacher Performance Assessment (edTPA)—which will be required for graduation from teacher education programs and licensure in the state of Illinois starting in 2015—make it critical for teachers, teacher educators, and school administrators to understand how video attributes can influence viewers’ perceptions. I am uniquely positioned, as a video producer and scholar, to investigate and theorize classroom video. In an article titled “Guerrilla Video: A New Protocol for Classroom Video,” which appeared in a special issue of *Educational Technology* on video in teacher education, I describe why and how teachers can use consumer-level equipment to produce videos that capture the classroom environment so that their teaching can be appropriately and fairly assessed. These concepts are further developed in an accepted chapter on “Technical Considerations and Issues in Recording and Producing Classroom Video,” which will appear in a forthcoming book on video in teacher education.

Along with exploring the recording of classroom video, I have also investigated innovative uses of video to accelerate pre-service teachers’ development of classroom awareness and self-reflection. A research study conducted with teacher supervisors in the SIUC teacher education program investigated the effectiveness of incorporating a video editing activity in a reflective teaching course for pre-service teachers. Some of the classroom videos of pre-service teachers that were recorded for that project were then used as “near peer” videos for the interactive video project described at the beginning of this reflection.

In summary, my research contributes in the burgeoning area of online learning and has established an emerging theory (XBT) that is used to accelerate the development of expertise in wide ranging performance areas, including classroom teaching.