

The Rigorous Application of Deliberate Practice Methods in Skills Courses

By Larry C. Farmer & Gerald R. Williams¹

Prepared for:
UCLA/IALS Sixth International Clinical Conference
Enriching Clinical Education

This draft may be cited provided you identify it as a draft and not a final document.
Please send comments to farmerl@lawgate.byu.edu or williamsg@lawgate.byu.edu.

© 2005 Larry C. Farmer & Gerald R. Williams

¹ The authors are Professors of Law at J. Reuben Clark Law School, Brigham Young University. This project was supported by funding provided by the Center for Instructional Design at Brigham Young University and by a grant of software and technical support provided by Microsoft Corporation. We wish to express our gratitude the Microsoft Education Solutions Group and the OneNote Product Management Group

The Rigorous Application of Deliberate Practice Methods in Skills Courses

By Larry C. Farmer & Gerald R. Williams

An apprentice carpenter may want only a hammer and saw, but a master craftsman employs many precision tools. Legal interviewing, counseling, and negotiation skills likewise require sophisticated tools to cope with the complexity of real situations, and only practice with these tools will build skill in their use.²

Introduction

In recent years, we have felt our students were not gaining enough from our courses in interviewing, counseling and negotiation.³ Like most skills teachers, we were using reflective practice as the primary vehicle for skills development. It seemed that our students were not reaching only rudimentary levels of competence in these essential skills. Students seemed to reach a plateau and we were rarely successful in getting them to progress beyond this point.⁴

² Paraphrased observation from Robert L. Kruse and Alexander J. Ryba, *Data Structures and Program Design in C++* p. xi (Prentice Hall, 1999) “The apprentice carpenter may want only a hammer and a saw, but a master builder employs many precision tools. Computer programming likewise requires sophisticated tools to cope with the complexity of real applications, and only practice with these tools will build skill in their use.”

³ We teach both three credit versions of these courses twice a year. The interviewing and counseling course is now limited to an enrollment of 16 students per semester; the negotiation course has a typical enrollment of 50 or more.

⁴ Research and experience indicate a similar dynamic obtains in law practice; within the first few years of practice, most lawyers reach a plateau or comfort level with these skills which they rarely surpass. The literature suggests this plateau effect derives from the human tendency to improve to “an acceptable level of proficiency” and then let up on our effort or divert our energy into other channels. Anders Ericsson summarizes the dynamics of the plateau effect as follows: “When individuals are introduced to a domain of activity they often reach an acceptable level of proficiency after a brief period of instruction followed by a limited period of effortful adaptation. During this early phase individuals typically gain immediate feedback about errors and inferior performance from more experienced participants or directly from the external environment, such as failures to return a tennis ball or to make a computer program run successfully. Under these conditions, individuals can “learn by doing” ... and improve their performance until an acceptable level is reached. However, beyond this point improvements in measured performance are typically modest in most types of leisure, and in many jobs and professional activities. This fairly stable adaptation to the demands of a domain does not appear to be due to a fixed upper limit on performance, as the efficiency of performance in many occupations can be dramatically increased with, for example, external incentives ...” K. Anders Ericsson, *The Acquisition of Expert Performance: An Introduction to Some of the Issues in The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports and Games* 35 (K. Anders Ericsson, ed., Lawrence Erlbaum Associates

This led us to begin a quest to learn more about the nature of expertise and to seek more powerful methods for moving our students in the direction of expertise in the skills we were teaching.⁵ Our most important discovery was a literature on “the acquisition of expertise” and, in particular, the concept of deliberate practice. This concept has been the foundation of our progress to date.⁶ What followed was a period of fairly constant experimentation from which evolved the methods we describe in this paper.

The literature on acquisition of expertise describes deliberate practice primarily as a process by which individuals develop exceptional skills under the supervision and direction of the best coaches and teachers. The teaching and coaching are most often one-on-one or in small groups so that instruction is tailored to each individual student and, more importantly, that each student enjoys almost continuous feedback from the coach or teacher. It follows that much of the challenge we faced in applying deliberate practice in our skills courses was to find ways to compensate for unfavorable teacher-student ratios. This is where computer technology came into its own. We found we could use computer technology as a substitute for long hours spent with each student and still provide individualized feedback, instruction, and encouragement.

1996). The plateau effect may result from a number of factors, but regardless of the underlying cause, it refers to a leveling off of certain professional skills in practice. Explanations for this phenomena include the observations that less motivated professionals will plateau minimal levels of competence and that some skills that are exercised in an environments that do not allow for feedback or reflective processes necessary to further skill development. “The push for action is sometimes powerful.... But unless one has the opportunity to think about what one is doing and to reflect on what went well, what went poorly, and why, the chances for a long-term improvement curve are slight. Time for individual and joint reflection must be built into the schedule; if it is not, then genuine changes is most unlikely to occur.” (p. 232) Howard Gardner, *The Disciplined Mind: What All Students Should Understand* 232 (Simon & Schuster 1999).

⁵ This undertaking was initially prompted, in large part, by a careful reading of Gary Blasi’s excellent article See Gary L. Blasi, *What Lawyers Know: Lawyering Expertise, Cognitive Science and the Functions of Theory* 313 (45 J. Legal. Educ. 1995).

⁶ We benefited most from the seminal work of Anders Ericsson and his associates on the role of deliberate practice in the acquisition of skills and from the pervasive literature on reflective practice as a basis for professional learning. Anders K. Ericsson, *The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports and Games* 35 (K. Anders Ericsson, ed., Lawrence Erlbaum Associates 1996). See also, Gary L. Blasi, *What Lawyers Know: Lawyering Expertise, Cognitive Science and the Functions of Theory*, 45 J. Legal. Educ. 313 (1995); Marshall; Donald Schön, *The Reflective Practitioner: How Professionals Think in Action* (Basic Books, 1983); John D. Bransford, Ann L. Brown, and Rodney R. Cocking, *How People Learn: Brain, Mind, Experience and School* (Editors, National Academy Press 2000); David A. Binder and Paul Bergman, *Taking Skills Training Seriously*, 10 CLINICLR 191 (2003).

In this article, we first review the elements of deliberate practice as presented in the literature on expertise acquisition and show how the better known techniques of reflective practice augment the learning that occurs through deliberate practice. We then describe the results of our efforts over the last five years to rigorously apply these concepts in our courses on interviewing and counseling and on negotiation. We then describe the technological innovations we put in place to support our restructured courses. Finally, we conclude with a report of our results to date and a summary of the core characteristics of the deliberate practice pedagogy that emerged from our endeavor.

Deliberate Practice

As we studied the skills development process and sought better ways for our students to learn the essential lawyering skills covered in our courses, our most valuable discovery was the work of cognitive psychologists who are seeking to account for the exceptionally skilled performances in such diverse domains as music, chess, athletics, medicine, and a few other specialized fields.⁷ Over the past 30 years, Professor Anders Ericsson and his colleagues have found that the best performers achieved their preeminence through a process they have named deliberate practice. Reduced to its bare essentials, deliberate practice occurs when individuals, who are highly motivated to develop a skill, engage in carefully sequenced set of structured practice activities aimed at developing a target skill. The classic reformulation of these conditions can be paraphrased in these terms: optimal learning takes place when (1) a highly motivated student (2) with good concentration (3) performs a well-defined task, (4) at an

⁷ Over the years, historians, biographers, psychologists, educators, and others proposed three possible explanations about the origins of such exceptional abilities: (1) inherited traits, such as superior intelligence, strength, dexterity, memory, “innate musical or artistic abilities,” (2) external factors, such as exceptional parental influences, education, study habits, or life experiences, or (3) better training and practice. Cognitive psychologists today favor better training and practice. *Prospects and Limits of the Empirical Study of Expertise: An Introduction, in Toward a General Theory of Expertise* 1, 4 (K. Anders Ericsson and Jacqui Smith eds., Cambridge University Press 1991).

appropriate level of difficulty, (5) receives informative feedback,⁸ and (6) is given opportunities for repetition to correct errors and polish the skill before moving to the next task.⁹

World-class performers differ not only in their use of deliberate practice, but also in their motivation to practice and their ability to concentrate when engaged in practice activities. The research is quite clear that this combination of variables constitutes “the road to excellence,” meaning it is a formula that can lead diligent subjects to exceptional levels of expertise in their chosen domains.¹⁰ With deliberate practice, “accuracy and speed of performance on cognitive, perceptual, and motor tasks” improve at an optimal rate. In other words, focused repetition of practice tasks provides optimal conditions for new learning which, over time, transform the learner’s ability to perform the target skill from a consciously directed activity that is initially awkward, mechanical, and formulaic to a well encoded activity that no longer requires step-by-step conscious guidance for its execution.¹¹

Ericsson and his colleagues did not invent deliberate practice. Their contribution was to document the elements of deliberate practice and to show that, when rigorously applied by motivated individuals, this method is an efficient and effective process for gaining expertise in many domains and instructional settings. Interestingly, the elements themselves can be derived from commonly and long understood educational principles. In this sense, they are not new to legal education. For example, twenty-five years ago, the teacher’s manual for a widely used legal interviewing and counseling textbook articulated many of the elements of deliberate practice in these terms:

We believe skills training should be conducted in a *step-by-step manner*.
Legal interviewing and counseling are both very complex processes and most students will have had little or no prior interviewing and counseling

⁸ Ericsson and his colleagues conclude that without sufficient feedback, “efficient learning is impossible and improvement only minimal even for highly motivated subjects. Hence mere repetition of an activity will not automatically lead to improvement . . .” K. Anders Ericsson, Ralf Th. Krampe & Clemens Tesch-Römer, *The Role of Deliberate Practice in the Acquisition of Expert Performance*, 100 *Psychological Review* 363, 367 (1993).

⁹ Anders K. Ericsson, *The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports and Games* 1, 20 (K. Anders Ericsson, ed., Lawrence Erlbaum Associates, 1996)

¹⁰ Anders K. Ericsson, *The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports and Games* 1, 11 (K. Anders Ericsson, ed., Lawrence Erlbaum Associates, 1996)

¹¹ “The more that higher skills such as bike-riding and cognition are practiced, the more automatic they become. When first established, these routines require mental strain and stretching—the formation of new and different synapses and connections to neural assemblies. But once the routine is mastered, the mental processing becomes easier. . . . This is the fundamental nature of learning in the brain.” John J. Ratey M.D., *A User’s Guide to the Brain* 38 (Pantheon Book 2001).

experience. ... Accordingly, we believe that the learning process can best be facilitated by presenting the material in a step-by-step or “building block” manner. Under this step-wise approach the student is afforded an opportunity to *master discrete concepts and techniques* before attempting the more difficult task of integrating the various concepts and techniques into the fluid process of an actual interview or counseling session.¹²

Thus, the techniques embodied in deliberate practice are not exceptional. What is exceptional is the discovery that their rigorous application is the method by which expertise is acquired across many domains. This documents the tremendous power of these techniques when applied rigorously and consistently with a desire to improve.

Although seemingly unrecognized by the deliberate practice researchers, deliberate practice has embedded in it “reflective practice” features that are necessary to turn practice experiences into learning. Reflective practice is a staple of experience-based education. Building on the work of John Dewey,¹³ Donald Schön,¹⁴ and others, reflective practice refers to methods that help subjects learn from their experiences, whether in externships, live clinical settings, or classes using simulations to teach lawyering skills. Skills teachers usually think of experiential learning as occurring in three stages: preparation, participation in the activity, and thinking afterwards about what happened. Although reflection is most directly invoked by the third stage of “thinking about what happened” it should also be part of preparation and, Schön strenuously argued, a part of the activity itself.¹⁵

¹² See David Binder and Susan Price, *Instructor's Manual for Legal Interviewing and Counseling: A Client-Centered Approach 3* (West Publishing 1979). This instruction is repeated in the newly published teacher's manual for the latest edition of the original text, David Binder, Paul Bergman, Paul Tremblay, Susan Gillig & Larry Farmer, *Teacher's Manual to Accompany Lawyer's As Counselors: A Client-Centered Approach 3* (Thomson/West 2005).

¹³ The concept of reflective thinking was introduced by the philosopher John Dewey in *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process* (Rev. ed., D.C. Heath and Co. 1933). Dewey was interested in the relationship between the world of thought and the world of facts, a relationship he felt was neglected by rationalist and empiricist theories of knowledge. Dewey encouraged teachers in elementary and secondary education to use his method to train students to keep their thinking processes firmly grounded in the world of facts and experimentation. He was not an advocate of experiential learning, although his influence has been in this direction. The concept of reflective practice was introduced by Donald Schön in *The Reflective Practitioner: How Professionals Think in Action* (Basic Books 1983). With his concepts of knowing-in-action and reflection-in-action, Schön worked to articulate how competent professionals learn from experience. Inspired by Schön's ideas, reflective practice has become a term of art.

¹⁴ Donald Schön, *The Reflective Practitioner: How Professionals Think in Action* (Basic Books 1983).

¹⁵ *Reflection: Turning Experience Into Learning* 10 (David Boud, Rosemary Keogh, & David Walker, eds., Kogan Page 1985). Boud et al. explain role of reflection in experiential learning in these terms: “Learners

In a very real sense, both deliberate practice and reflective practice are a set of skills in their own right. They are methods for learning from experience. Jennifer Moon describes reflective practice as having a problem solving orientation to one's own practice with the general aim of improvement. As a process, it involves skills or abilities such as these:

- An on-going motivation to maintain self-awareness
- Mindfulness regarding professional skills and handling events related to one's practice
- A critical orientation toward the performance of one's professional skills or the handling of events in practice
- An ongoing process of self-evaluation
- An openness to evaluation by others¹⁶

Methods for inviting reflective learning usually include reflective discussions (e.g. preparation sessions, debriefing or feedback sessions), exhortations to be mindful during practice, (reflection-in-action; reflection-on-action), and reflective writing (e.g. reflective journals).

Boud et al. have observed that, if we consider the ability to learn from experience as a set of skills, the process of reflection is the skill most lacking in experiential learning.¹⁷ While true, this is an alarming conclusion because, as is the case with most skills teachers, reflective practice has been the primary vehicle for learning and, unfortunately, we were strongly of the opinion that our students were not progressing well enough in their skills development. Reflective practice was not sufficient, by itself, to produce the learning we expected in our students.

Deliberate practice provides exactly the ingredients needed to take reflective practice to its full potential. The elements of reflective practice permeate deliberate practice activities. Reflective tasks are included in deliberate practice activities in at least four ways. First, deliberate practice is engaged in by highly motivated individuals who, in an effort to improve the performance of target skills, develop and pursue carefully crafted practice activities. Second, each deliberate practice activity includes a period of preparation during which a target skill is identified, a practice task is developed or selected to specifically facilitate the development of the

are coping with a considerable amount of new information, they are facing personal demands and the situation forces them into active involvement whether they like it or not. Reflection is needed at various points: at the start in anticipation of the experience, during the experience as a way of dealing with the vast array of inputs and coping with the feelings that are generated, and following the experience during the phase of writing and consolidation." Id.

16 Jennifer A. Moon, *Reflection in Learning & Professional Development* (Kogan Page 2000).

¹⁷ {Boud 1985 #2180} at 8.

target skill and performance goals are identified for the practice activity. Third, the person engaged in a deliberate practice activity must concentrate on the effective performance of the practice task in order to achieve maximum benefit from the practice session. Finally, the deliberate practice method requires learners to engage in a post-performance evaluation in order to identify performance problems and to identify ways to correct those problems in subsequent practice rounds.

In summary, we concluded that the deliberate practice concept, while not precisely defined in all respects, provided a sufficiently well articulated set of guidelines around which we could construct a new instructional approach for our courses. Lest it sound too easy, there is a slight catch: to achieve world-class expertise, subjects must devote themselves to deliberate practice four to six hours per day, five or six days a week, for about ten years. Obviously, law school skills teachers have more modest goals than producing world class expertise and work within more limited time frames. Our experiment has been to see the extent to which deliberate practice can increase student skills development in a semester's time.

Measuring Skills Exercises Against a Deliberate Practice Standard

The better we understand the power of deliberate and reflective practice when rigorously applied, the more we are aware of the deficiencies in our former approach to skills training. Take, as a representative example, our skills exercises. They have been similar and often identical to those used in skills courses in other law schools. But when evaluated against the demands of deliberate practice, we could see they suffer from a number of limitations:

- 1) The exercises are too comprehensive in scope and content, requiring students to perform a series of challenging tasks in a single sitting. It would be better to break the exercises down into short, well-defined tasks and to give students feedback and the chance to repeat each exercise a sufficient number of times correct their errors and to fix their learning;¹⁸. The shorter exercises would be arranged so that students developed their skills in appropriate incremental steps that added up to a systematic skills development program.

¹⁸ "Neurons that fire together wire together" means that the more we repeat the same actions and thoughts—from practicing a tennis serve to memorizing multiplication tables—the more we encourage the formation of certain connections and the more fixed the neural circuits in the brain for that activity become. "Use it or lose it" is the corollary: if you don't exercise brain circuits, the connections will not be adaptive and will slowly weaken and could be lost." John J. Ratey, M.D. *A User's Guide to the Brain* 31 (Pantheon Book 2001)

- 2) Because each exercise calls upon students to carry out a number of difficult tasks, students tend to focus their preparation not on skills, but on the substantive aspects of the problem. For this reason, students come to such exercises unprepared for the kind of learning we hope they would gain. We relied upon unstructured reflective methods that relied on memory-based feedback and analysis rather than a detailed analysis of a video recorded task. The exercises and our procedures failed to give students the quality of feedback required for them to progress. It was difficult if not impossible for our students learn specifically what errors they had made. Our students had almost no opportunity to repeat their performances with enough precision to correct their errors. The exercises did not provide a basis for accurately monitoring the progress of our students.
- 3) Although the exercises were enjoyable and beneficial to our students, the scope of the exercises caused students to focus on the big picture rather than on discrete tasks and micro-skills. Students had little incentive or motivation to seek detailed feedback, identify and correct of errors, and focus on developing and refining the micro-skills associated with well-defined tasks.

A metaphor illustrates our understanding of how deliberate practice relates to skills development. Learning to interview, counsel, or negotiate is, in part, like learning to drive a car. To become a competent driver, students must master a number of separate skills, such as starting the engine, putting the car in gear, releasing the safety brake, making sure the path is clear, putting the car into motion, keeping it on course, observing traffic signals and rules of the road, avoiding obstacles, making sure there is sufficient fuel, accelerating and decelerating smoothly, judging speed and distance from other objects, backing up, parallel parking, adjusting for adverse weather and road conditions, and so on. Students can memorize a list of steps required for each operation without ever sitting behind a steering wheel. However, to become skillful as drivers, students must learn the mechanics of each skill and practice it until they can perform it smoothly and automatically in concert with all of the complementary skills required for safe and effective driving. To fail at an essential skill is to fail, possibly mortally, at the whole task of driving a car.

In the language of this metaphor, we used to assume that our students come into our courses knowing how to drive a car reasonably well, and that our task was to help them become more skillful drivers by reading and discussing the theory behind these skills and by giving them a few opportunities to “put it all together” in simulated exercises. Deliberate practice findings

helped us realize that the gap between a novice struggling with fundamental skills and a lawyer who can effectively perform lawyering skills is substantial and cannot be closed or even narrowed without a more rigorous and systematic program of training and practice.

The literature on acquisition of expertise vividly demonstrates that skill development and skill retention are directly related to the quality of practice and the number of hours spent in deliberate practice.¹⁹ Complex skills that are only partially developed are unlikely to be retained much beyond the initial period of instruction.²⁰ Thus, our reading of the deliberate practice literature brought us to the conclusion that we could not be content with our prior methods of skills teaching.

Rigorously Applying Deliberate Practice

A few years ago we set out to redesign our courses in Interviewing and Counseling and in Negotiation to apply the elements of deliberate and reflective practice as fully as possible.²¹ We teach both courses twice a year, so in the past three years we've taught our respective courses six times. Each semester we have taken steps to improve our application of the model, and each semester the results have encouraged us to do more. Over time, this process has resulted in a major restructuring of both our courses. In this section of the paper, we describe the most important elements of our approach. Because these elements are interdependent, our experience in applying them was not linear but cyclical. We learned, for example, that improving exercises to focus well-defined tasks did not, in itself, produce the gains we were hoping for. Even the best exercises are not sufficient unless we can provide students with adequate feedback on their

¹⁹ The general findings of this research indicate that “higher...levels of attained performance” are closely related to larger amount of practice and “the amount of accumulated practice is monotonically related to the attained levels of expert performance.” To achieve world-class performance levels, athletes typically must employ deliberate practice methods 4 to 6 hours per day for about ten years (approximately about 10,000 to 15,000 hours of disciplined effort). Although our law school has been generous in expanding its skills offerings, we are still well short of the 10,000 plus hours necessary for our students to achieve world-class expertise as counselors or negotiators

²⁰ Cite literature.

²¹ Our experiment, then, has been to apply as many elements of deliberate practice as possible within the confines of our respective courses and, given certain time and budgetary constraints, to improve upon these elements to the full extent possible within our institutional and technological limitations (student and personal budgetary constraints and our technological abilities; find hardware and software solutions that are affordable (to our students and to the law school), within our technological abilities, and easy for our students to use.)

performances.²² From this perspective, our most important breakthrough was developing a relatively inexpensive and efficient way for students to record their exercises on video and to review and analyze their own performances against well-defined criteria while, at the same time, providing a reasonably efficient method for us to review student performances and analyses and give them our feedback about their work. For this reason, we begin with video recording and review.

Capturing Students Performances with Web Cameras and Laptop Computers

We recognize there is nothing new about using video recordings in skills classes. Like many other skills teachers, we have been using video feedback for over 20 years. However, we have tended to limit our use of videotaping because of the time, effort, and logistical complexity required to carry it out.²³ Our challenge was to find a more efficient way to record all, or almost all, student exercises. Further, the method needed to work in class, when students are paired off to simultaneously engage in exercises, as well as out of class, when students are given a number of days to complete a negotiation exercise. After considering a number of options, our solution was to purchase inexpensive web cameras²⁴ that could be attached to the students' notebook computers²⁵ to record in-class and out-of-class exercises.²⁶ This technology is simple and easy to

²² [fn: add Larry's footnote explaining that he had implemented virtually all of deliberate practice except for pervasive video and found it did not bring the intended improvement.

²³ The task of video recording about 20 skills exercises for each student in an Interviewing and Counseling class of 16 students would require about 320 hours of media services time per semester. The five negotiation exercises recorded by 40 to 50 negotiation students would take another 200 hours of media services time. Together these recording requirements for these two classes would consume most of the law school's media services, leaving very little room for anyone else.

²⁴ We obtained a small grant to acquire 44 high end Logitech Orbit web cameras that could be connected to student notebook computers using a USB2 cable. The cameras to be used by the students were packaged in pairs in 20 protective camera cases for storage and handling. The cases were divided into two groups of ten cameras cases each. One group of cameras was to be used to record out-of-class exercises was made available to students as a reserve check out item in the law library; the other group was kept on a cart that could be delivered to the classroom for recording in-class exercises.

²⁵ Law students at BYU are all required to own notebook computers that are capable of driving a web camera recording session. When they arrive for classes in the fall, all first-year and transfer students entering the Law School each year are required to have laptop computer configured to meet designated specifications.

²⁶ Each student participating in an in-class exercise in the Interviewing & Counseling course is required to record the exercise on his or her notebook computer. All student exercises in the Negotiation course are recorded using web cameras. The web cameras proved to be remarkably durable and reliable. Only one camera of the original forty-four failed and had to be replaced during the first year they were in use. The use of web camera proved to be a cost-efficient way to capture student performance because: (1) web camera technology is designed to be simple and nominally resource intensive; (2) web cameras are much less expensive than standard video cameras; (3) all exercise recording using web cameras can be

operate, the cameras are reliable, audio and video quality are more than adequate for our purposes, and digital video is more convenient to record, copy, upload, and review than analog videotape or digital videotape recordings.²⁷ To our delight, this simple expedient has ignited student interest in skills development and has been a driving force encouraging us find methods for maximizing the value of these video recordings.

Our method of pervasive video recording raises a number of issues concerning students rights of privacy. At the beginning of each semester, we explain how we plan to use video recording and review, including how files will be uploaded to a server and downloaded for review by instructors and teaching assistants. We then obtain express permission from our students for videos to be used in these ways. Since we use some of the student videos in class to demonstrate various points about the skills involved, we also give our students the right to opt out of having their videos shown in class. Finally, we expressly commit all students who stay in the class to honor our rules protecting against unauthorized viewing or copying of videos. Of course, the videos are also password-protected to reduce the likelihood of unauthorized access to them.

Performance Analysis and Evaluation

The degree of skills development achieved through deliberate practice exercises depends on the timely evaluation by students and instructors of each student performance. When there is no video record, student participants and their observers must rely on their best recollection of

accomplished by the students engaged in the exercise, thus, avoiding substantial personnel costs; (4) web camera quality is more than adequate to capture video and audio at levels that are satisfactory our purposes (up to 640 by 480 frames at 30 fps); and (5) exercises are automatically recorded on each student's notebook computer in a digital format that is much more convenient to review than standard VHS or digital video tape recordings. The web camera approach made a recording task affordable and manageable that was otherwise not practical because of the associated expenses and personnel requirements. In the Interviewing and Counseling course, approximately fourteen in-class deliberate practice exercises are recorded by students using their notebook computers and web cameras; six out-of-class exercises are recorded in the Media Services recording studio by media services staff. Virtually no staff time is required to record exercises using the web cameras. Thus, beyond the initial task of getting web camera management software installed on student notebooks and instructing the students to use the web camera management software the web camera approach to pervasive video recording of student exercise caused very few resource demands on law school media staff.

²⁷ Every student during the first year and a half of web camera use has been able to successfully use the web cameras to record his or her deliberate practice exercises. We still continue to use the law school recording studio for major exercises, but web cameras are used for all other practice exercises. For example, each semester Interviewing and Counseling students will record about four in-class exercises for every exercise recorded in the recording studio

events.²⁸ There is no opportunity to replay significant events to refresh memories of what happened. Recollections are imperfect and tend to be self-serving. Thus, feedback based on recollection is a poor substitute for feedback based on a video recording. Further, writing journal entries without a video recording imposes a double burden on students. First, they must concentrate on the substance and skills involved in the exercise, certainly a task worthy of their full attention. Then, at the same time, students are supposed to make mental notes of the important events in the exercise and of their own thoughts and feelings about each event so they will be able to record and reflect upon them later, when they write their journals or other type of post-exercise reflection. Obviously, energy devoted to remembering events, thoughts, and feelings is not available for performance of the exercise and vice versa.

The degree of skills development that results from deliberate practice exercises depends on the timely evaluation by students and instructors of each student performance. When there is no video record, student participants and their observers must rely on their best recollection of events. There is no opportunity to replay significant events to refresh memories of what happened. Recollections are imperfect and, psychologists tell us, tend to be self-serving. Thus, feedback based on recollection is a poor substitute for feedback based on a video recording. Reflective journals and papers also suffer the limitations of imperfect recollection and effects of the self-serving bias. Further, writing journal entries without a video recording imposes a double burden on students. First, they must concentrate on the substance and skills involved in the exercise, certainly a task worthy of their full attention. Then, at the same time, students are supposed to make mental notes of the important events in the exercise and of their own thoughts and feelings about each event so they will be able to record and reflect upon them later, when they write their journals or other type of post-exercise reflection. Obviously, energy devoted to remembering events, thoughts, and feelings is not available for performance of the exercise and vice versa.

²⁸ In order to establish an initial skill measure, the Interviewing and Counseling course uses a baseline consultation to help students capture a video record of their untrained interviewing and counseling skills. The baseline consultation is conducted with the student in a lawyer role interviewing and counseling a standardized client during the first week of the semester. At the end of the consultation, the students are then required to spend three to five minutes on camera evaluating their performance in the evaluation. Students review this recording at the end of the semester to compare their initial skill set to the skills they have mastered in the course.

With the addition of pervasive web camera recording, students can now obtain a video record of all significant practice exercises. This fact challenged us to find economical ways to improve the timeliness, quality and quantity of feedback our students receive. In order to improve the quality of student evaluations, we added more detailed and specific performance evaluation tasks to our courses. In these tasks, we now require each student to use exercise specific performance evaluation templates that are designed to guide them through the evaluation process for each exercise in a step-by-step fashion. The net result is that students are spending relatively more time reviewing, analyzing, and critiquing on their own performances than in the past. The enhanced evaluation procedures are designed to generate more timely, concrete, accurate, and realistic performance evaluations and provide a basis for more specific instructor feedback to each student.

Performance evaluation templates typically include evaluation tasks in which the student is asked to identify the counter location of specific events in the recorded exercise and to analyze those events. The evaluation templates also contain a concluding section in which the student is ask to generally reflect on the exercise experience and to identify problems that need to be corrected in the next round. A thoughtful performance review using these templates typically takes between 45 minutes to two hours. Students are not required to invest more than sixty minutes per exercise in evaluation but many report spending two hours or more to complete their evaluations.

Trimming the Curriculum

As students began spending more time and energy preparing for exercises, recording exercises, evaluating them and receiving feedback, be began refocusing and streamlining the substantive content of our courses. This reduced our coverage of theoretical material and the amount of time devoted to traditional content and teaching methods.²⁹ We feel we can increase the depth and permanence of student learning by focusing on core concepts and essential tasks and skills rather than surveying all relevant material.

Identifying Well-Defined Tasks and Associated Skills

A deliberate practice approach to skills instruction assumes the existence of an identifiable set of basic tasks and skills to be learned through practice exercises. Implementing

²⁹ Three-fourths of the deliberate practice exercises in the Interviewing & Counseling course are done during the regular class hour to insure that they are done properly and on a tight schedule. This approach minimizes the amount of out-of-class scheduling and coordination that students have to do.

deliberate practice-based pedagogy, we first needed to identify what we consider to be the essential interviewing, counseling and negotiation skills.

In an ideal world, students would do several exercises to practice each essential task with its constituent skills. Inevitably, the number of tasks exceeds the number of practice exercises we can squeeze into our three-credit courses. As an expedient, we have had to use exercises that call for students to practice more than one task per exercise. This risks overloading the learning task and undermining the deliberate practice. Thus, we were forced, by resource and time limitations, to pare the list to those skills that seemed most essential for each unit of instruction.³⁰ This has been a useful and challenging process, as it has forced us to be more clear in defining tasks and skills and to more rigorous in determining which tasks and skills are essential.

The practice tasks we have been developing are divided between mini-exercises, which focus on a limited number of skills, and full simulations, in which students are expected to demonstrate the complete repertory interviewing, counseling or negotiation at their command. The mini-exercises should include (1) clearly defined learning objectives, (2) well-defined tasks that have been set at the right level of difficulty,³¹ (3) tasks which, if performed knowledgeably and well, will satisfy the learning objectives, and (4) instruments or methods for assessing performance that will help students identify their errors, correct them, and polish their skills.

The mini-exercises provide an additional benefit in that they keep exercise-related time demands more manageable so students will have more time to review, analyze and critique their own performances.

Sequencing Course Content

The more we focused on essential tasks and skills, the more we recognized the need to align practice experiences with the substantive content of the course and vice versa. Learning is optimized when course content and exercises are sequenced in a coordinated, step-wise fashion

³⁰ For the Interviewing & Counseling course the essential skill set for which practice exercises were developed included sub-skills such as: (1) implementing a basic counseling/problem solving model; (2) guiding/framing a counseling process; (3) providing a legal status summary; (4) formulating and overviewing options; (5) evaluating options; (6) engaging the client in the evaluation process; (7) encouraging a client decision; (8) guiding an implementation discussion; (9) implementing an initial consultation model; (10) setting up a professional relationship; (11) obtaining a narrative; (12) using the time-line interview method; (13) using the t-funnel interviewing method; (14) using question types appropriately; (14) using summary; (15) guiding/framing an interview; etc. Each target skill was included as a component in at least two exercises.

³¹ This means meaning challenging but not overwhelming in the number of skills involved, the amount of time required, or the complexity of the task.

that lays a better theoretical foundation for the development of specific skills and provides role-plays with concrete opportunities to build the skills associated with the current content.

Student Preparation and Motivation

The impact of deliberate practice on skill development is also governed by the quality of students' preparation for a practice exercise, their focus and concentration during practice, and their post-practice analysis and feedback that leads to error identification and new goals for the next practice session. It is not likely to be effective unless students understand the method and gain the motivation to rigorously apply it. Deliberate practice doesn't happen, and its benefits do not accrue, if students ignorantly go through the motions of a practice task. Deliberate practice, at its core, is a learning strategy that works best when individuals are highly motivated.³²

We concluded that in order to effectively employ deliberate practice methods, we had to find ways to motivate our students to strive toward the acquisition of target skills rather than to dutifully, but mindlessly, perform deliberate practice exercises. We ultimately have come to rely on three things to maintain student motivation.

First, we begin our courses by teaching deliberate practice and its benefits, so our students can knowledgeably engage in deliberate practice activities. To this end, we assign reading materials and devote an early class hour in each course to an examination of the deliberate practice method and its role in the acquisition of skills.

Second, we find that our students are motivated by the clear sense of direction and purpose that the stepwise application of deliberate practice provides for them. With this method, it is possible to show them at the beginning of the course the sequence of topics and tasks that will lead them to develop and begin to master the core skills required to competently carry out these lawyering tasks. This gives students reason to make a commitment to the whole enterprise which helps sustain their motivation throughout the semester.

A third motivational element is pervasive video recording and post-performance evaluation. Much to our delight, we have found when students know each exercise would be recorded, analyzed and reviewed, they prepare better for the exercises, they perform the

³² Anders Ericsson highlights the motivational element of deliberate practice when it is applied to professional education. "Whereas teachers in traditional domains of expertise start guiding the skill development of children, medical educators must encourage adult students to engage in the demanding processes involved in building the necessary skills and representations by drawing on and alerting students' full cooperation and active participation in the learning process." K. Anders Ericsson, *Deliberate Practice in the Acquisition and Maintenance of Expert Performance in Medicine and Related*, 79 *Academic Medicine* S79 (October Supplement 2004).

exercises with greater focus, they are more effective in analyzing the resulting performances, and they are more receptive to feedback. We foster a learning environment in which individual preparation, practice and analysis are constantly on display for both the learner and the instructor. Increasing the number and quality of exercises recorded on video is more labor intensive for instructors as well as students, but we have found that the pedagogical benefits far outweigh the costs involved.

File Exchange for Instructor's Review and Feedback

Recording all deliberate practice exercises produces large numbers of video files and an equivalent number of performance evaluation documents that need to be exchanged between students and instructors.³³ As a result, we needed to find a way to manage this substantial volume of video and textual material.

Again we turned to computer technology to address the problem. Based on our experience, the best solution is to have students upload their video and text files to a network server. It is helpful if the server has software that helps manage these files. Our solution has been to use a dedicated network server running Microsoft Windows Server 2003 and Microsoft SharePoint Services.³⁴ We use the SharePoint services not only to provide students a simple way to upload their deliberate practice video files and performance evaluation documents to a password-protected area on the intranet, but also as a way to distribute exercise materials to our students.

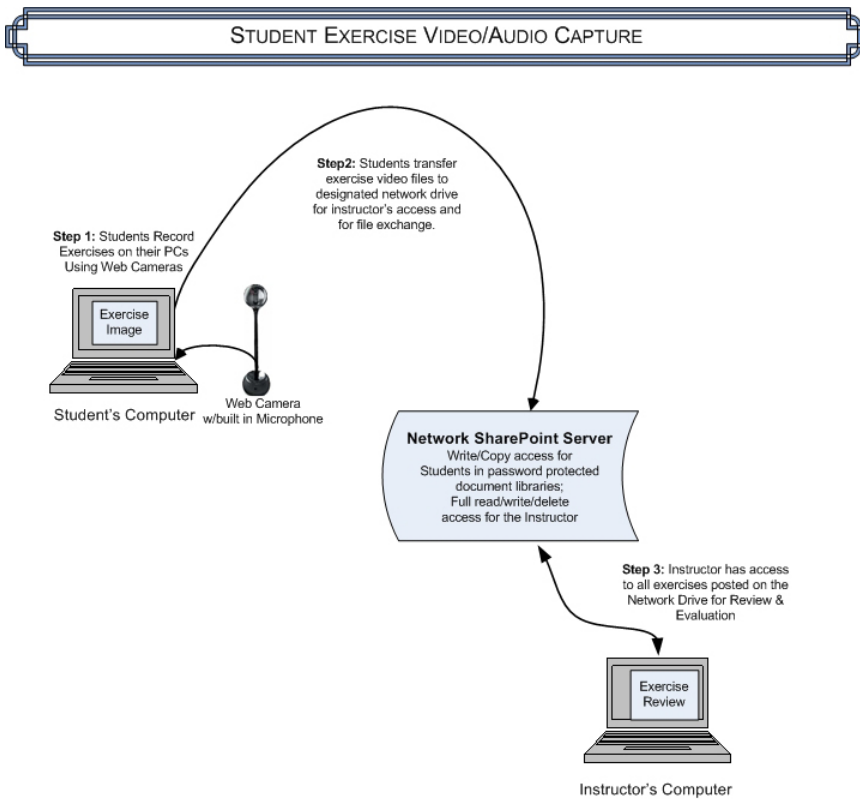
We use SharePoint document libraries to post sample video files, exercise instructions, and performance evaluation templates that can be downloaded by our students. Students are assigned individual document libraries into which they post their exercise video recordings and

³³ The deliberate practice exercise in the Interviewing and Counseling course generated an average of about 400 video files per semester and about 300 performance evaluation documents. Technological support, as described in this paper, was critical to the successful implementation of deliberate practice methods for a number of reasons. The effective implementation of deliberate practice methods in our courses meant that we would be asking our students to do many more simulated exercises than we had previously required and that most exercises would need to be recorded, reviewed, and analyzed. It also meant that students and instructors would need to have an efficient way to exchange video recordings and performance reviews. It simply would not have been possible to accomplish the pedagogical goals listed in this paper while trying to manage the logistics associated with the application of deliberate practice methods the convenience and efficiencies produced by the technologies we employed.

³⁴ Microsoft describes SharePoint services as "an integrated portfolio of collaboration and communication services designed to connect people, information, processes, and systems both within and beyond the organizational firewall." See <http://www.microsoft.com/WindowsServer2003/technologies/sharepoint/default.aspx> for more information about Share Point services.

their performance evaluation documents.³⁵ The document libraries are set-up so the instructors have unrestricted access to all student postings. This allows us, at our convenience, to download and review student exercise videos and performance evaluation documents from their SharePoint libraries into a word processor for review and editing.³⁶ At present, we are using Windows Media Player to review videos. The logistics associated with deliberate practice process would have been overwhelming and the process impractical without a network server and supporting software.

Figure 1 below illustrates how web cameras, laptop computers, and SharePoint libraries are used to manage the logistical tasks associated each deliberate practice exercise.



³⁵ SharePoint, at our option, notifies us by email each time a student posts a file in his or her document library. Conversely, student can be notified by email each time we provided feedback on an exercise by adding comments to a student's performance evaluation document and then reposting it.

³⁶ One very convenient SharePoint feature is the automatic ability to save a new version of edited documents back in a student's document library.

A Deliberate Practice Pedagogy

The research on expertise acquisition, while it identifies a number of characteristic methods associated with the acquisition of expert performance, doesn't specifically propose a derivative pedagogy.³⁷ After striving for several years to develop methods designed to rigorously implement the deliberate practice concepts in our courses, we sense that we are moving in the direction of a distinct pedagogy for the acquisition of certain legal skills that is derived from the expertise literature and more specifically from the theory of deliberate practice. Clearly, most of the instructional methods we have implemented in our revamped courses have been articulated elsewhere in educational discourse in legal education, but not under a single rubric. Thus, we see value in suggesting that this approach might best be seen as a distinct approach to skills instruction within legal education, much like the clinical method or Langdellian method.

In our view, a deliberate practice pedagogy for the development of legal skills should follow these general guidelines.

Target skill set. This method necessarily has as its foundation the identification of a target task. The deliberate practice approach must be built on this foundation since its focus is always the acquisition of precisely defined skills using well-defined practice tasks. The method makes sense and can only succeed if the initial set of tasks and skills are accurately identified.

Guiding principles. The target skills must be taught in the context of general principles that guide the application of the skills such as the Model Rules of Professional Conduct and interviewing and counseling the concepts collectively known as client-centered practice.

Supporting theory. The target skills are best taught and understood in the context of theoretical concepts that provide (1) a reason for each skill in the target set and (2) a basis for understanding the operation of the skill in practice. Expert knowledge is found to be highly organized. The guiding principles and particularly the supporting theory provide an organizing framework into which the experiential learning generated by the practice experiences is structured for better retention and for more effective application over time.

Well-defined practice tasks. Deliberate practice pedagogy must ultimately be centered on a set of well defined tasks, primarily practice exercises, which are designed to give learners the opportunity to practice the skills of the target skill set. These exercises will not only help

³⁷ Although, Anders Ericsson is beginning to explore the possible role of deliberate practice as an educational method in "medicine and other domains." K. Anders Ericsson, *Deliberate Practice in the Acquisition and Maintenance of Expert Performance in Medicine and Related*, 79 *Academic Medicine* S79 (October Supplement 2004).

students develop a facility with the skills, but ultimately promote a deeper understanding of the skills as they can lead to experientially-based connections with the guiding principals and supporting theory.

Sequenced tasks. The student's experience with the practice tasks should be carefully sequenced to the student's current skill and knowledge level and designed to lead the learner in a step-wise fashion toward the ultimate mastery of the target skill set. Random practice exercises while helpful cannot be as effective in building an organized knowledge base for the application of the target skills.

Careful preparation for practice exercises. Students should be encouraged to carefully prepare for each practice exercise to insure maximum benefit and efficiency in the acquisition of the target skill. This is particularly important in the law school context since the current culture of legal education doesn't allow student's the luxury of investing copious amounts of time in the acquisition of practice oriented legal skills.³⁸

Focused execution. Expertise acquisition research indicates that concentration during a practice exercise is related to the effectiveness of the exercise in producing new learning.³⁹

Capturing performance for review and feedback. The video or audio capture of all significant deliberate practice performances should be a central feature of the method since these recordings to provide the essential basis for effective feedback and analysis.

Feedback through self-evaluation and instructor review. Feedback is a key feature of deliberate practice. Research has shown that the amount of learning obtained from a practice experience depends heavily the student's opportunity to review and analyze the practice performance and to receive feedback from subject matter experts.⁴⁰ Self-evaluation is essential for efficient skill development. Thus, a keystone of the deliberate practice method is the need for students to carefully review each of their performance videos. For novice students, this review process should be highly structured to teach students how to effectively and carefully analyze their own performances. Student's who are experienced in the use of these methods would require less structured performance reviews.

³⁸ Include a comparison here of the amount of time devoted to skill acquisition in other disciplines such as medicine (internships, residencies, etc.) and clinical psychology.

³⁹ Cite literature from brain research and expertise acquisition research.

⁴⁰ Cite literature on the necessity of feedback. Cite literature on the interfere that results from concurrent attempts to perform and to evaluate performance. Problems with observers – real time observation – to point-of-reference for the feedback.

Repetition of practice tasks. As much as possible, each student should be given repeated experiences with each practice task so he or she can evolve a target skill across successive practice sessions by correcting errors observed preceding practice tasks and more permanently learn the practiced skill. The relationship between effective repetition the degree and permanency of learning is well established in learning theory.⁴¹

Develop an understanding of the deliberate practice method. It is important for student to have an appreciation role of deliberate practice methods in the development of new skills since the process works best when students are fully engaged in the deliberate practice process. The application of this method is sufficiently unique in legal education that students need to develop an understanding of the process in order to appreciate their role in the various elements of the process.

Next Steps

The application of deliberate practice methods described in this paper has dramatically changed course and classroom dynamics, and increased student motivation and participation. It appears that amount and quality of student learning has significantly increased as well. Skill improvement can be documented by comparing student performances on capstone exercise videos going back five years.⁴² Our current perception is that those using deliberate practice are measurably better. At present, we have only anecdotal evidence from recently graduated students on retention and transfer.⁴³

⁴¹ Citation for quote. Further, expertise researchers have found that “practice is not only important for the acquisition of expert performance but also for its maintenance.”

⁴² A BYU doctoral student is doing a dissertation study of student performance differences in capstone interviewing videos recorded from Fall semester 2001 through Winter semester 2006 in the Interviewing and Counseling course.

⁴³ As an illustration, consider the following comment was recently forwarded to one of the authors by a recent graduate. It is apparent that she was able to recognize interview patterns in a real world situation and to draw upon her practiced skills in her first consultation some six months after taking the Interviewing and Counseling course. “One of the most interesting things to see here is the attorney-client relationships, especially in light of the counseling class last year. I sat in on one interview where I wanted to interrupt the lawyer because the client was getting peppered with questions in a very stream of conscious way. One attorney even said she wanted to ask questions while she could remember to ask them (as opposed to write them down for later). Surprising pieces of the story kept coming out, which I think would have come out better if the client had been able to just tell her story, and then have the attorneys ask her t-funnel questions. I got the chance to interview one client (the interview lasted 3 hours), and I was excited to try my interviewing skills. I admit it was difficult, especially because it was such a long interview, and so much information. But the interviewing framework I learned last year helped. I tried to keep things organized, and frame and t-funnel.”

The results we've observed encourage us to continue to our efforts to find better ways to apply deliberate practice methods in our courses. In the near term, our first priority is to improve on the methods we are using to support student self-evaluations and provide students with instructor feedback. The more efficient these processes, the more practice and evaluations we can assign as possible within the constraints of the course. At present, the evaluation task is quite tedious and time consuming event though digital video is a great improvement over our prior use of videotape recordings and videotape playback equipment.⁴⁴

In thinking about how to shorten the time required for performance evaluations, we came upon an idea for a new computer-based video evaluation tool that could bring more options and greater efficiency to the task. In collaboration with the BYU Center for Instructional Design,⁴⁵ we are designing and building a software-based Performance Analysis Tool (PAT). The PAT design allows users to efficiently tag, categorize, and attach written comments to any number of events in a video recording. PAT files, which we call session files, contain these annotations and can be saved to disk and easily distributed to others who are using the PAT tool.

Students can use the PAT tool to evaluate their performances and upload the files to instructors and teaching assistants for review. Instructors and TAs can efficiently review the "virtual clips" that students have tagged and annotated and add their own comments which are returned to students. Students again use PAT to review the instructor's feedback and, if they wish to do so, append further comments, criticisms, and suggestions.

The PAT program allows students to:

- Review performance video recordings on their laptop computers
- Watch for, tag, categorize, and comment upon noteworthy events in the performance. Their work doesn't alter the video file -- the PAT session file containing this information is saved as an XML file and can be sent, along with the video file, to the instructor or any other user.

⁴⁴ Students concurrently review their exercise videos in Windows Media Player while recording their observations in Microsoft Word. Media Player can be configured to sit on top of the open word processing window to simplify the task of switching between windows. We provide students with exercise specific evaluation templates for each exercise that help organize and guide the evaluation process. The tedious elements of this process result from the frequent need to note in the word processing document the location of the specific events in the video file. The task isn't quite as tedious for the instructor who has to use student notations in the word processing document to manually locate video segments referenced in student evaluations.

⁴⁵ Collaborators on this project include Professors Gerald Williams and Larry Farmer from the BYU Law School and Professor Raymond Robinson from the BYU School of Dance.

- Immediately play any spot in the video by clicking on a tag
- Review virtual video “clips” of all marked events or any subset of marked events

The PAT program gives instructors and TAs an extremely efficient way to review the “virtual clips” students have identified, tagged, and commented upon. They can easily add their own written comments, criticisms, and suggestions, which are recorded in a different color font, and return the file to the student as feedback. Other PAT features make it a useful instructional tool in the classroom.

We anticipate that PAT tool development will be far enough along to be used in our deliberate practice courses in Beta form during Winter Semester 2006 and as a fully functional version beginning with the 2006/2007 school year.

In addition to the development of the PAT program, we are actively refining and developing the practice tasks and developing a wider range of video illustrations that can be used by students when preparing for practice exercises.

In conclusion, we are pleased with progress on this project thus far and recognize that we still have at least a several years of active experimentation ahead in order to fully test the potential of the rigorous application of deliberate practice concepts in our skills courses.