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Did Harvard Get It Right?

Laurel Currie Oates

Abstract:

Q: Did Harvard get it right when it adopted the casebook method over 150 years ago?

A: Maybe.

Many first-year law students struggle to understand why law professors force them to divine legal principles from judicial decisions, some of which were decided before their grandparents were born and others which seem to be written in a foreign language. Wouldn't it much be easier, and better, if law schools used the same pedagogy that is used in many other disciplines: reading assignments, lectures, and exams that test whether students have learned the information set out in those textbooks and lectures? The students have a point. Recent research from educational psychologies suggests that, by itself, the casebook method is not particularly effective in helping students learn either the law or to how to use the law to solve problems. However, the casebook method may be an extremely effective method of helping students develop what researchers call "adaptive expertise" if, after questioning students about the cases, professors present a lecture that summarizes the concepts that the cases were selected to illustrate. Instead of describing this new research using the conventional format, this article models the process that the researchers advocate: in the first section the author asks the reader to do a "data analysis" exercise, in the second part she provides the reader with a "lecture," and in the third part she asks the reader to apply what they have learned to determine whether Harvard did, in fact, get it right.

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Laurel Currie Oates[1]

For most law students, there is a moment when, in frustration or exhaustion, they throw up their hands and say (or maybe scream), "There must be a better way." While many of the cases in the casebooks are interesting, learning the law one case at a time seems, at best, inefficient, and, at worst, just plain stupid.[2] Wouldn't it much be easier, and better, if law schools used the same pedagogy that is used in many other disciplines: reading assignments, lectures, and exams that test whether students have learned the information set out in those textbooks and lectures?

When students question law school pedagogy, some law school professors respond by pointing out that law schools have been using the casebook method, and the form of Socratic questioning that typically accompanies it, since the method was first introduced by Christopher Columbus Langdell at Harvard in the 1870s.[3] According to these professors, the casebook method is the best method because the primary goal of law schools is not to teach students the law but to teach them to "think like lawyers."[4] Are these professors right? Did Langdell, and Harvard, get it right when they rejected more traditional pedagogies and adopted the casebook method?

This article explores these questions in a way that is different from the way in which they are typically approached.[5] First, this article is different from other critiques of

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[2] Karl Lewellyn expressed a similar sentiment when he stated, "[M]an could hardly devise a more wasteful method of imparting information about subject matter than the case class." Karl N. Llewllyn, *The Current Crisis in Legal Education*, l J. LEGAL EDUC. 211, 215 (1948).

[3] During his tenure as the dean of Harvard Law Schol, Christopher Columbus Langdell introduced a number of significant reforms, including requiring a bachelor's degree for admission, the use of a graded and sequential curriculum, annual examinations for continuation and graduation, an independent career track for professional faculty, the transformation of the library from a textbook repository into a scholarly resource, and, maybe most importantly, the casebook method of teaching. Bruce A. Kimball, *The Langdell Problem: Historicizing the Century of Historiography, 1906–2000s*, 22 LAW & HIST. REV. 277, 277 (2004).

[4] *See, e.g.*, David P. Bryden, *What Do Law Students Learn? A Pilot Study*, 34 J. LEGAL EDUC. 479, 479 (1984); David D. Garner, *The Continuing Vitality of the Case Method in the Twenty-First Century*, 2000 B.Y.U. EDUC. & L.J. 307, 323-25 (2000); Ruta K. Stropus, *Mend It, Bend It, and Extend It: The Fate of Traditional Law School Methodology in the 21st Century*, 27 LOY. U. CHI. L.J. 449, 465-7 (1996).

[5] For an annotated bibliography, see Arturo López Torres & Mary Kay Lundwall, *Moving Beyond Landgell II: An Annotated Bibliography of Current Teaching Methods for Law Teaching*, 35 GONZ. L. REV. 1, 9-10,

legal education in that the primary source of information is not law school professors but educational psychologists, in particular, educational psychologists who study learning and transfer.[6] Second, this article is different in that it is written in a way that illustrates one of the techniques that recent research indicates is likely to improve transfer. Part I requires the reader to do what has been labeled as "data analysis." Having done this data analysis, the reader moves to Part II of the article, a "lecture" that summarizes the research on transfer. Part III presents a new task, a task in which the reader is asked to transfer what he or she learned in Part I and Part II to a new situation. The fourth part, Part IV, describes and evaluates four different methods for teaching law.

Part I: "Data Analysis"

Presume for a moment that you are a psychology professor who has been asked to design a unit that will teach undergraduates about the various theories relating to memory and the memory performances that they predict. Spend five, ten, or even fifteen minutes listing the pros and cons of each of the following teaching methods.

Option 1: Summarize + Lecture

Have students read a textbook chapter that describes several classical research studies using both textual explanations and graphs, and then have them write a one- to two-page paper summarizing what they have just read. Use class time to provide students with a lecture that explains the experiments, the results, and the theories that were designed to accommodate the results.

Option 2: Data Analysis + Lecture

Have students read two or three research studies. Use the first class to have students look for interesting patterns and the second class to provide students with a lecture that explains the experiments, the results, and the theories that were designed to accommodate the results.

Option 3: Data Analysis + Review of Data Analysis

Have students read two or three research studies. Use the first class to have students look for interesting patterns. During the second class, have students look

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43 (2000). *See also* Arturo López Torres, *MacCrate Goes to Law School: An Annotated Bibliography of Methods for Teaching Lawyering Skills in the Classroom*, 77 NEB. L. REV. 132, 139, 141, 142, 145, 150, 152, 159, 167, 186 (1998).

[6] There are, of course, other articles that have applied educational research to legal education. *See, e.g.*, M. H. Sam Jacobson, *Learning Styles and Lawyering: Using Learning to Organize Thinking and Writing*, 2 J. ASS'N LEGAL WRITING DIRECTORS 27 (2004); Paula Lustbader, *Theme in Academic Support for Law Schools: Construction Sites, Building Types, and Bridging Gaps: A Cognitive Theory of the Learning Progression of Law Students*, 33 WILLAMETTE L. REV. 315 (1997); Gary L. Blasi, *What Lawyers Know: Lawyering Expertise, Cognitive Science, and the Functions of Theory*, 45 J. LEGAL EDUC. 313 (1995).

at the studies one more time, looking for patterns that they may have missed the first time.

Part II: The "Lecture"

In the early days of *Saturday Night Live*, Father Guido Sarducci proposed a new type of university: The Five-Minute University.[7] Because most students forget most of what they are taught, the Five-Minute University would teach only those things that the typical student remembers. For example, if five years after taking a Spanish class, the typical student remembers only two phrases, "¿Como esta usted?" and "Muy gracias," professors at the Five-Minute University would teach only those two phrases. Similarly, if five years after graduation the only thing that most students remember from their economics course is the phrase "supply and demand," the Five-Minute University would teach only that phrase.[8]

Not surprisingly, Father Guido Sarduci's routine struck a cord with many *Saturday Night Live* viewers.[9] Based on experience, viewers knew that they remembered on only a small percentage of what were taught in school.[10] Even more troubling, however, were studies that showed that even when individuals remembered what they had been taught, few were able to use that information at work or in their daily lives.[11]

A. Classical transfer

Historically, transfer has been defined as "the degree to which a behavior will be repeated in a new situation."[12] In addition, historically, studies of transfer involved isomorphic problems in well-structured domains.[13]

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[7] GILDA LIVE (Warner Bros. 1980). A clip of Donald A. Novello's performance as Father Sarducci is available at http://www.cs.washington.edu//info/videos/asx/5minuteU.asx (last visited Feb. 17, 2007).

[8] *Id*.

[9] *See* Daniel L. Schwartz, John D. Bransford & David Sears, *Efficiency and Innovation in Transfer*, *in* TRANSFER OF LEARNING FROM A MODERN MULTIDISCIPLINARY PERSPECTIVE 1, 14 (Jose P. Mestre ed., Information Age Publishing 2005).

[10] *See id.*

[11] *See, e.g.*, Jo Boaler, *Open and Closed Mathematics: Student Experiences and Understandings*, 29(1) J. RES. IN MATHEMATICS EDUC. 41, 41 1998; JEAN LAVE, COGNITION IN PRACTICE: MIND, MATHEMATICS, AND CULTURE IN EVERYDAY LIFE (LEARNING IN DOING) (Cambridge University Press 1988), *cited in* Schwartz, Bransford & Sears, *id.* at 4; Alan H. Schoenfeld, *When Good Teaching Leads to Bad Results: The Disasters of 'Well-Taught' Mathematics Courses*, 23(2) EDUC. PSYCHOLOGIST, 145, 164-65 (1988).

[12] Douglas K. Detterman, *The Case for the Prosecution: Transfer an Epiphenomenon*, *in* TRANSFER ON TRIAL: INTELLIGENCE, COGNITION, AND INSTRUCTION 1, 4 (Douglas K. Detterman & Robert J. Sternberg eds., Ablex Publishing Corp. 1993). Other individuals have defined transfer as "the ability to extend what has been learned in one context to new contexts." JAMES P. BRYNES, COGNITIVE DEVELOPMENT AND LEARNING IN INSTRUCTIONAL CONTEXTS 74 (Allyn and Bacon 1996), *cited in* NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN: BRAIN, MIND, EXPERIENCE, AND SCHOOL 51 (John D. Bransford, Ann L.

In one of the earliest studies of learning and transfer, Thorndike and Woodworth asked their subjects to estimate the area of a rectangle. [14] After this pretest, the subjects were given the opportunity to develop their ability to estimate the area of a rectangle through practice and feedback. Although most subjects became relatively good at this task, most of them did poorly on the posttest: estimating the area of a circle. Because few of the subjects transferred what they had learned about estimating the area of a rectangle to the task of estimating the area of a circle, Thorndike and Woodworth concluded that "the ability to estimate area" was not a general skill.[15]

The classic study is, however, Gick and Holyoak's study. In this study, Gick and Holyoak read the following story to their subjects.[16]

Fortress Problem

> A small country fell under the iron rule of a dictator. The dictator ruled the country from a strong fortress. The fortress was situated in the middle of the country surrounded by farms and villages. Many roads radiated outward from the fortress like spokes on a wheel. A great general arose who raised a large army at the border and vowed to capture the fortress and free the country of the dictator. The general knew that if his entire army could attack the fortress at once, it could be captured. His troops were poised at the head of one of the roads leading to the fortress, ready to attack. However, a spy brought the general a disturbing report. The ruthless dictator had planted mines on each of the roads. The mines were set so that small bodies of men could pass over them safely, since the dictator need to be able to move troops and workers to and from the fortress. However, any large force would detonate the mines. Not only would this blow up the road and render it impassable, but the dictator would then destroy many villages in retaliation. Therefore, a full-scale direct attack on the fortress appeared impossible.

Brown & Rodney R. Cocking eds., Expanded Ed. 2000) [hereinafter NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN].

[13] Well-structured problems are problems that require the application of a limited number of rules and principles within well-defined parameters. *See, e.g.* Norman Frederiksen, *Implications of Cognitive Theory for Instruction in Problem Solving*, 54(3) REV. OF EDUC. RES. 363, 363 (1986).

[14] Edward L. Thorndike & Robert S. Woodworth, *The Influence of Improvement in One Mental Function Upon the Efficacy of Other Functions*, 8 PSYCHOL. REV. 247, 560 (1901), *discussed in* John D. Bransford & Daniel L. Schwartz, *Rethinking Transfer: A Simple Proposal with Multiple Implications*, 24 REV. OF RES. IN EDUC. 61, 62 (1999) [hereinafter Bransford & Schwartz, *Rethinking Transfer*].

[15] Bransford & Schwartz, *Rethinking Transfer*, *supra* note 14, at 67.

[16] Mary L. Gick & Keith J. Holyoak, *Analogical Problem Solving*, 12 COGNITIVE PSYCHOL. 306, 349 (1980).

> The general, however, was undaunted. He divided his army up into small groups and dispatched each group to the head of a different road. When all was ready he gave the signal, and each group charged down a different road. All of the small groups passed safely over the mines, and the arm then attacked the fortress in full strength. In this way, the general was able to capture the fortress and overthrow the dictator.[17]

Gick and Holyoak then presented their subjects with Duncker's[18] tumor problem.

Tumor Problem

> Suppose you are a doctor faced with a patient who has a malignant tumor in his stomach. It is impossible to operate on the patient, but unless the tumor is destroyed the patient will die. There is a kind of ray that can be used to destroy the tumor. If the rays reach the tumor all at once at a sufficiently high intensity, the tumor will be destroyed. Unfortunately, at this intensity the healthy tissue that the rays pass through on the way to the tumor will also be destroyed. At lower intensities the rays are harmless to healthy tissue, but they do not affect the tumor either. What type of procedure might be used to destroy the tumor with the rays, and at the same time avoid destroying the healthy tissue?

Those familiar with the two problems can see the parallels. First, in both problems there is an object that must be destroyed. Second, in both problems a direct attack will not work. Finally, in both problems you can destroy the object by using divergence and convergence. Despite these parallels, few of Gick and Holyoak's subjects saw the connections between the two problems. For example, after reading the fortress story, only 20% of the subjects used the division and convergence solution to solve the tumor problem.[19] Other studies have presented subjects with similar problems have had similar results. For instance, Reed, Ernst, and Banerji found that most individuals who had learned to solve a missionary-cannibal problem did not apply that solution to the jealous husbands – wife problem, which is identical to the missionary-cannibal problem except that the jealous husbands and wives replace the missionaries and cannibals.[20]

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[17] *Id*. at 351.

[18] Karl Duncker, *On Problem Solving*, 58 PSYCHOLOGICAL MONOGRAPHS 1, 2-17 (1945).

[19] Gick & Holyoak, *supra* note 16 at 325.

[20] Stephen K. Reed, George W. Ernst & Ranan Banerji, *The Role of Analogy in Transfer Between Similar Problem States*, 6 COGNITIVE PSYCHOL. 436, 437-38 (1974) (problem regarding how to safely cross a river in a limited-capacity boat).

Based on studies like those described above, researchers identified four steps involved in transfer: problem representation, search and retrieval, mapping, and application.[21]

1. Problem Representation

Most problems can be represented in a number of different ways: they can be represented in terms of their surface features, that is, the specific facts of the problem;[22] they can be represented in terms of their underlying structures, that is, those abstract features or principles that are relevant to the solution;[23] and they can be represented in terms of the procedures required to solve the problem.[24] Research has shown that the way in which an individual represents a problem depends on his or her level of expertise.[25] While novices will represent the problem in terms of its surface features,[26] experts will represent it in terms of its surface features, its underlying structure, and the procedures required to solve the problem.[27] For example, a novice would represent the fortress problem in terms of its specific facts: a fortress, a general who wanted to attack the fortress, and mines on the roads leading to the fortress. In contrast, the expert would represent the problem not only in terms of its specific facts but also in terms of the more general structure of the problem, that is, both as a problem involving an object that must be destroyed but that cannot be directly attacked and as a problem that can be solved using a division and convergence problem solution.

2. Search and Retrieval

Once individuals have represented the problem, they begin searching their memories for an analogous problem that they can use to solve the current problem. Three factors seem to affect this process.

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[21] Zhe Chen, *Schema Induction in Children's Analogical Problem Solving*, 91(4) J. EDUC. PSYCHOL. 703, 704 (1999). *See also* Laura R. Novick, *Analogical Transfer, Problem Similarity, and Expertise*, 14(3) J. EXPERIMENTAL PSYCHOL.: LEARNING, MEMORY, & COGNITION 510, 511 (1988).

[22] Novick, *supra* note 21, at 511.

[23] *Id.*

[24] Zhe Chen, *Analogical Transfer: From Schematic Pictures to Problem Solving*, 23 MEMORY & COGNITION 255, 257 (1995).

[25] Novick, *supra* note 21, at 511. *See also* Brian H. Ross, *Distinguishing Types of Superficial Similarities: Different Effects on the Access and Use of Earlier Problems*, 15 J. EXPERIMENTAL PSYCHOL.: LEARNING, MEMORY, AND COGNITION 456, 456 (1989).

[26] Novick, *supra* note 21, at 518.

[27] *Id.*

The first factor is the individual's level of expertise.[28] Because novices represent problems in terms of their surface features, or facts, in searching their memories they look only for problems that involve similar fact patterns.[29] For example, when given the tumor problem, novices search their memories for prior problems involving tumors. In contrast, experts will search their memories not only for prior problems with similar facts but also for problems that have the same underlying structure.[30] Thus, experts would search their memories both for problems involving tumors and for problems involving objects that must be destroyed but that cannot be directly attacked. The result is that while the novices would not find an analogous problem, the experts might.[31]

The second factor that affects the search and retrieval process is the level of abstraction at which the individual represents the problem's surface and underlying structural features.[32] Sander and Richard have hypothesized that individuals look first for an analogy that shares, at a concrete level, the same surface and structural features as the problem that they have been asked to solve. [33] For example, in learning how to use a text editor (word processor), individuals will look first to the domain of typing. If the first analogy that they look to is not sufficient to help them solve the problem, they will then look to a more abstract "domain." For instance, if they cannot learn to use a text editor by referring back to their knowledge about typing, individuals will look to the general domain of writing. If they are still not able to solve the problem, many individuals will look to the even more general domain of object manipulation.

The third factor that appears to affect the search and retrieval process is the way in which individuals store what they learn.[34] A number of researchers have suggested that knowledge is typically embedded in the context in which the knowledge was originally acquired.[35] As a consequence, when individuals learn a particular concept in a

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[28] *Id.*

[29] *Id*.

[30] *Id*

[31] The finding that novices typically search for problems with similar surface features is illustrated in Legal Writing by the observation that, in researching a problem, most first-year students look for cases that have the same facts as the facts in their problem. For example, when asked to research a problem involving the search of a locked glove compartment, some students look only for cases involving the search of a locked glove compartment. Unless they are prompted, they do not look for cases involving other types of locked containers.

[32] Novick, *supra* note 21, at 511.

[33] Emmanuel Sander & Jean-Francois Richard, *Analogical Transfer as Guided by an Abstraction Process: The Case of Learning by Doing in Text Editing*, 23 J. EXPERIMENTAL PSYCHOL.: LEARNING, MEMORY, & COGNITION 1459 (1997).

[34] Miriam Bassok & Keith J. Holyoak, *Interdomain Transfer Between Isomorphic Topics in Algebra and Physics*, 15 J. EXPERIMENTAL PSYCHOL. 153, 153 (1989).

[35] *Id.*

math class, that concept is stored with other information that they have learned in math classes. This storage system works well when the new problem is encountered in the same context as the old problem. When individuals encounter the new problem in math class, they will search their memories for similar problems encountered in math class. The system does not work, though, when the new problem is encountered in a different context. If the individual encounters the new problem at work, he or she will search for similar problems encountered at work and not for prior problems encountered in math class. As a result, it is unlikely that the individual will be able to retrieve the prior problem.

3. Mapping

If the individual is successful in finding a prior problem, he or she then compares the prior problem with the new problem.[36] This part of the process can fail for either of two reasons. First, the individual may compare only the surface features of the two problems and not the underlying structures, a process that can lead an individual to incorrectly conclude that the two problems are similar when in fact they are not.[37] For example, in working on a memo or brief, first-year law students may decide that a case that they have located is analogous to their case because the facts of the two cases are similar: both cases involve one individual striking another individual with a baseball bat. In fact, one case may be a criminal case and the other a civil case or, even if the causes of action are the same, the issues might be different. In one case, the court may be deciding whether the trial court erred in denying a motion to suppress evidence and in the other it may be deciding whether the trial court's instructions were proper. Second, the individual may compare only the underlying structures.[38] For instance, in comparing math problems, students may recognize that both problems require the use of the same equation but not be able to determine which variable goes in which slot.[39] Even though the first problem is by far the more common of the two problems, for transfer to occur, the individual must be able to map correctly both the surface features and the underlying structures.[40]

4. Application

The final step in the process is the application of the solution from the first problem to the second problem. Although this part of the process is usually relatively easy, it sometimes fails because the individual does not know the procedure for solving

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[36] *See* Sander & Richard, *supra* note 33, at 1461.

[37] Ross, *supra* note 25, at 457-58.

[38] Laura R. Novick & Keith J. Holyoak, *Mathematical Problem Solving by Analogy*, 17 J. OF EXPERIMENTAL PSYCHOL.: LEARNING, MEMORY, & COGNITION 398, 410-11 (1991).

[39] Bassok & Holyoak, *supra* note 34, at 159.

[40] Chen, *supra* note 24, at 256.

the first problem and cannot, therefore, transfer that solution to solve the second problem.[41] In addition, it sometimes fails because the individual does not make the necessary adaptations. [42]

However, even when researchers and educators have tried to use these four factors to enhance transfer, the results have not been promising. As Detterman point out in his often-cited book, Transfer on Trial, "most studies fail to find transfer" and "those studies claiming transfer can only be said to have found transfer by the most generous of criteria."[43]

> In all of the studies I am familiar with that claim transfer, transfer is produced by "tricks" of what kind or another. These tricks most often involve just telling the subject to transfer by using hints or outright suggestions. In most subtle cases, the "trick" includes manipulations that call the subjects [sic] attention, in obvious ways, to what the experimenter expects on the transfer problem. In short, from studies that claim to show transfer and that don't show transfer, there is no evidence to contradict Thorndike's general conclusions: Transfer is rare, and its likelihood of occurrence is directly related to the similarity between two situations.[44]

As a result, Detterman rejects the doctrines of formal discipline[45] and transfer. Instead, he argues that if you want "people to learn something, teach it to them."[46]

> In summary, there is almost no evidence to support the educational philosophy of formal discipline or any of its variants. There is no good evidence that people produce significant amounts of transfer or that they can be taught to do so. There is, on the other hand, substantial evidence and an emerging *Zeitgeist* that favors the idea that what people learn are specific examples. Experts are experts because they have learned many more examples than novices. When the expert is studied, the behavior may look mystical and appear to be unexplainable without involving complex concepts like transfer. However, current evidence suggests all that is necessary to be an expert is time, basic ability, and the opportunity to learn a large body of exemplars by experience.[47]

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[41] *Id.*

[42] *Id.*

[43] Detterman, *supra* note 12, at 15.

[44] *Id.*

[45] *Id.*

[46] *Id.* at 21

[47] *Id.* at 17.

Thus, while as a new teacher, Detterman believed that the discovery of principles was a fundamental skill that students needed to learn and transfer to new situations, later in his career he viewed education, including graduate education, as the learning of information. As a consequence, he provided his students with the principle, presumably through reading assignments and lectures, and then illustrated that principle through the use of examples.[48] According to Detterman, "you should teach people exactly what you want them to learn in a situation as close as possible to the one in which the learning will be applied." [49]

D. A Broader View of Transfer

Not all researchers are, however, as pessimistic as Detterman. Those researchers who view learning not in behaviorist terms but as a process of constructing new knowledge argue for a broader definition of transfer and for the use of different measurement tools.[50] For instance, Schwartz, Bransford, and Sears distinguish between learning and transfer that involves the "direct application" (DA) of information or a skill learned in one environment to a new environment and learning and transfer that prepares students for future learning (PFL).[51] In addition, Schwartz, Bransford, and Sears distinguish between studies that require subjects to transfer what has been learned in one environment to what they call a "sequestered problem solving" (SPS), that is, an environment in which subjects "have no access to "contaminating" information other than what they have learned previously and in which they are not given the opportunity to learn by trying out an idea and revising as necessary," and studies that look at how prior learning prepares students for future learning.[52]

In making these distinctions, Schwartz, Bransford, and Sears adopt Broudy's three types of "knowing": replicative knowing, applicative knowing, and interpretive knowing.[53] According to Broudy, replicative knowing involves remembering facts, and applicative knowing involves applying previously acquired knowledge to solve new

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[48] *Id.*

[49] *Id.*

[50] Schwartz, Bransford & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 4-6. *See also* Bransford & Schwartz, *Rethinking Transfer, supra* note 14, at 66; Erik De Corte, *Transfer as the Productive Use of Acquired Knowledge, Skills, and Motivations*, 12(4) CURRENT DIRECTIONS IN PSYCHOLOGICAL SCIENCE 142, 143 (2003).

[51] Schwartz, Bransford & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 5.

[52] *Id.* at 5. *See also* De Corte, *supra* note 50, at 143, 145.

[53] Schwartz, Bransford, & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 8-11 (discussing Harry S. Broudy, *Types of Knowledge and Purposes of Education*, *in* SCHOOLING AND THE ACQUISITION OF KNOWLEDGE 1-17 (Richard C. Anderson, Rand J. Spiro, & William E Montague eds., Lawrence Erlbaum Assoc. 1977)).

problems.[54] In contrast, interpretive knowing refers to an individual's prior experiences and learning, which determine what one notices about new situations and how one frames the problem, which in turn affects thinking and cognitive processes.[55] According to Broudy, people "know with" knowledge even if they cannot remember specific facts (knowing that) or how to carry out a particular set of actions (knowing how).[56] Schwartz, Bransford, and Sears also distinguish between "transferring in" and "transferring out."[57] While "transferring out" occurs after a particular type of learning experience, "transferring in" refers to the prior interpretive knowledge that a person brings to a learning experience.[58]

In exploring their broader definition of transfer, Schwartz, Bransford, and Sears examined a proposition often advanced by teachers: that students learn better, and are more likely to transfer what they have learned, when they are given the opportunity to actively explore situations through the use of discovery learning, hands-on learning, or experiential learning.[59]

Thus, in their 1998 study, Schwartz and Bransford looked at the task that you set out at the beginning of this article: determining the best way to teach undergraduates about the various theories relating to memory and the memory performances that they predicted.[60]

Students in the first group, the Summarize + Lecture group, read a textbook chapter that described several classic studies using both textual explanations and graphs and then wrote a one- to two-page summary of the material that they had just read.[61] In contrast, students in the second group, the Data Analysis + Lecture Group, were asked to analyze and graph data sets from classic memory experiments to find the "interesting" patterns.[62] Several days later, students in both groups listened to a lecture that explained the experiments, the results, and the theories that were designed to accommodate the

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[54] *Id.*

[55] *Id.*

[56] *Id.* at 16.

[57] *Id.* at 11-12.

[58] *Id.*

[59] *Id.* at 16-17.

[60] *Id.* at 17-20. *See also* Daniel L. Schwartz & John D. Bransford, *A Time for Telling*, 16(4) COGNITION AND INSTRUCTION 475, 475-76 (1998) [hereinafter Schwartz & Bransford, *A Time for Telling*].

[61] Schwartz, Bransford & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 18.

[62] *Id.*

results.[63] Students in the third group, the Data Analysis + Data Analysis Group, did the same data analysis activity as the students in the second group but, instead of listening to the lecture, they analyzed the data a second time looking for patterns that they might have missed the first time.[64]

Group 1	Summarize + Lecture
Group 2	Data Analysis + Lecture
Group 3	Data Analysis + Review of Data Analysis

A week later, students in all three groups were asked to do two tasks.[65] The first task required students to recall factual assertions from the lecture. For example, students were asked whether "When people understand something they have read, they tend to remember it verbatim. True or false?"[66] In the second task, students were asked to read about a new, and novel, experiment and to predict as many outcomes from the experiment as possible.[67]

On the first task, which tested recall or memory, the students in the first two groups, the Summarize + Lecture Group and the Data Analysis + Lecture Group, performed at a similar level while the students in the third group, the Data Analysis + Data Analysis Group, did substantially worse.[68] In contrast, on the second task, which tested the students' ability to read about a new, and novel, experiment and to make predictions, the students in the second group, the Data Analysis + Lecture Group, did substantially better than the students in the other two groups.[69] See the following chart, which is reprinted from *Efficiency and Innovation in Transfer*.[70]

[63] *Id*.

[64] *Id.* at 18-19

[65] *Id.* at 19.

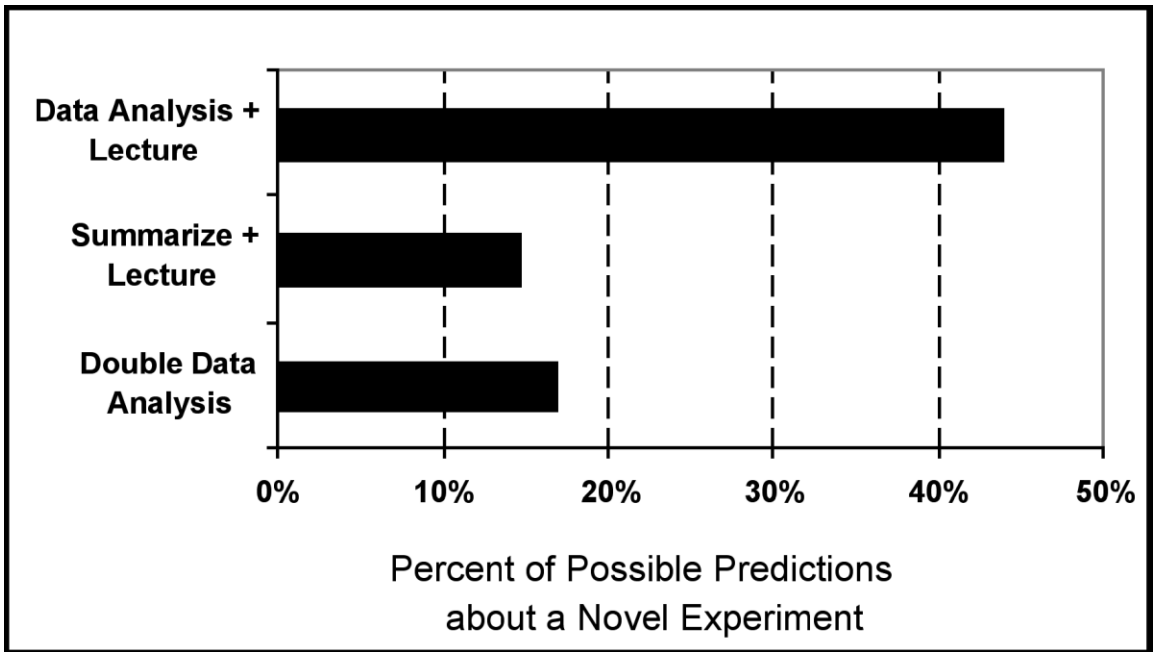
[66] *Id*.

[67] *Id.*

[68] *Id.*

[69] *Id.*

[70] *Id.*



In analyzing the results, Schwartz, Bransford, and Sears concluded that giving individuals the time to explore contrasting cases can be an effective way of preparing individuals to learn and that that lectures can be an effective method of instruction if the individuals listening to the lecture are prepared to understand the significance of what the lecture has to offer.[71] In addition, Schwartz and Bransford emphasized the importance of using different measures of learning and transfer: recall measure will, more likely than not, produce different results than measures of transfer that look at preparation for future learning.[72]

Relying of this study and other more complicated studies,[73] Schwartz, Bransford and Sears argue that that activities that appear inefficient for direct problem solving (applicative knowing) can still shape individual's interpretive knowing and yield measurable benefits for learning.[74]

This study and similar studies suggest that the following factors affect transfer.[75]

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[71] *Id*. at 20.

[72] Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 93-94.

[73] *See, e.g.*, Daniel L. Schwartz and Taylor Martin, *Inventing to Prepare for Learning: The Hidden Efficiency of Original Student Production in Statistics Instruction*, 22(2) COGNITION & INSTRUCTION 129 (2004).

[74] Schwartz & Bransford, *A Time for Telling*, *supra* note 60, at 511. The study is also described in Schwartz, Bransford & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 17.

[75] *See, e.g.*, Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 63-65; NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN, *supra* note 12, at 51-78.

1. Mastery of the material.

Bransford and Schwartz start with what should be the obvious: you can't transfer what you do not know.[76] If students do not learn the material that is to be transferred, they cannot transfer that information to the new task.

According to Bransford and Schwartz, this factor explains why, in at least some of the studies of classical transfer, the subjects did not transfer what they had learned in one situation to a new situation.[77] To illustrate the point, Bransford and Schwartz cite a series of studies designed to see whether students who had been taught to debug programs suing LOGO could transfer those skills to other areas.[78] Although in these studies the students did not transfer what they had learned, a later analysis of these studied indicated that the studies "failed to assess the degree to which LOGO was learned in the first place" and that, more like than not, the students had not learned enough about LOGO to form a foundation for transfer.[79] In later studies in which more attention was paid to student learning, transfer was found.[80]

2. Learning for understanding.

The way in which students master the material also matters. The National Research Council argues in How People Learn that students who "learn with understanding" are more likely to be able to transfer what they have learned than students who have only learned to mimic a set of fixed procedures.[81]

This is not to say that facts are not important. To the contrary, the National Research Council emphasizes that the research on expertise in areas such as chess, history, science, and mathematics establishes that experts in these fields have a rich and

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[76] *See* Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 63-64; NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN, *supra* note 12, at 53.

[77] Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 63-64.

[78] *Id*. (discussing David Klahr & Sharon M. Carver, *Cognitive Objectives in a LOGO Debugging Curriculum: Instruction, Learning, and Transfer*, 20 COGNITIVE PSYCHOL. 362 (1988)); *see also* NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN, *supra* note 12, at 55;

[79] Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 63-64 (citing, e.g., Klahr & Carver, *supra* note 78); *see also* NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN, *supra* note 12, at 55.

[80] NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN, *supra* note 12, at 55 (citing Klahr & Carver, *supra* note 78; Joan Littlefield, Victor R. Delclos, Sharon Lever, Keith N. Clayton, John D. Bransford & Jeffrey J. Franks, *Learning LOGO: Method of Teaching, Transfer of General Skills, and Attitudes Toward School and Computers* in TEACHING AND LEARNING COMPUTER PROGRAMMING: MULTIPLE RESEARCH PERSPECTIVES 111 (Richard E. Mayer ed., Lawrence Erlbaum Assoc. 1988)).

[81] *See* NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN, *supra* note 12, at 55; Schoenfeld, *supra* note 11, at 164-65.

deep knowledge of the facts related to their area of expertise.[82] It distinguishes, though, between usable knowledge and lists of disconnected facts.[83] As the National Research Council notes, "experts' knowledge is connected and organized around important concepts, (e.g. Newton's second law of motion); it is conditionalized to specify the contexts in which it is applicable; and it supports understanding and transfer (to other contexts) rather than only the ability to remember."[84]

For example, contrast the way students are taught about arteries with the way in which experts think about them.[85] The typical biology textbook sets out facts about veins and arteries, and, on test, students are asked to answer questions like the one set out below.

1. Arteries
    a. Are more elastic than veins
    b. Carry blood that is pumped from the heart
    c. Are less elastic than veins
    d. Both a and b
    e. Both b and c

While both students and experts can answer this question, the ways in which the typical students and the typical expert think about veins and arteries is very different.[86] While the typical student might be able to parrot information that he or she has memorized, the expert not only knows the facts but also understands them.[87] Experts knows why veins and arteries have particular properties, they know that blood pumped from the heart exits in spurts and that the elasticity of the arteries helps accommodate pressure changes, and they know that the blood from the heart needs to move upward to the brain but also downward and that the elasticity of an artery permits it to function as a one-way value that closes at the end of each spurt and prevents the blood from flowing backward.[88] Because the experts "understand' the facts, they are better able to transfer to transfer their knowledge of arteries to a project requiring them to design artificial arteries.[89]

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[82] NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN, *supra* note 12, at 9 (citing Chase & Simon, *infra* note 103; Chi, Feltovich & Glaser, *infra* note 134)

[83] *Id.*

[84] *Id.*

[85] *Id.*

[86] *Id.*

[87] *Id.*

[88] *Id.*

3. Use of concrete examples

There is some evidence that the use of case-based, problem-based, or project-based learning enhances initial learning.[90] There is, however, also evidence that information and procedures learned in this way can impede transfer if the information or procedures are tied to closely to a particular content.[91] For example, researchers at the Technology Group at Vanderbilt found that if students learn a concept in only one context, they are not usually able to transfer what they have learned in that one context to other contexts.[92]

There are, however, some solutions. Although time consuming, one solution is to have students solve the same or similar problems in a variety of different contexts.[93] A second, more efficient solution is to have the student solve one problem but then engage them in a "what if" discussion in which the students are presented with a number of different hypotheticals.[94] A third solution is to ask students to create a solution that would solve a class of related problems.[95]

4. Metacognition

While there is still much research to be done, there are studies that suggest that teachers can increase transfer by helping students monitor and reflect upon the strategies that they use in learning and solving problems.[96] In one intervention study, Masui and De Corte trained college freshman self orienting and self judging in the context of a business economics course.[97]

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[89] *Id.*; *see also* JOHN D. BRANSFORD & BARRY S. STEIN, THE IDEAL PROBLEM SOLVER: A GUIDE TO IMPROVING THINKING, LEARNING, AND CREATIVITY (Worth Publishing, 2d ed. 1993).

[90] Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 64-65.

[91] *Id.*; *see, e.g.*, COGNITION AND TECHNOLOGY GROUP AT VANDERBILT (CTGV), THE JASPER PROJECT: LESSONS IN CURRICULUM, INSTRUCTION, ASSESSMENT, AND PROFESSIONAL DEVELOPMENT (Lawrence Erlbaum Assoc. 1997) [hereinafter CTGV, THE JASPER PROJECT].

[92] CTGV, THE JASPER PROJECT, *supra* note 91, *discussed in* Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 64-65.

[93] *See id.*, *discussed in* Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 64.

[94] *See id.*, *discussed in* Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 64.

[95] *See id.*, *discussed in* Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 64; *see also* John D. Bransford, Linda Zech, Daniel Schwartz, Brigid Barron, Nancy Vye & CTGV, *Designs for Environments That Invite and Sustain Mathematical Thinking*, *in* SYMBOLIZING, COMMUNICATING, AND MATHEMATICS CLASSROOMS: PERSPECTIVES ON DISCOURSE, TOOLS, AND INSTRUCTIONAL DESIGN (Paul Cobb, Erna Yackel & Kay McClain eds., Lawrence Erlbaum Assoc. 1998) [hereinafter Bransford et al., *Designs*].

[96] Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 65.

> Orienting is a genitive self-regulating activity, and involves preparing oneself to learn and solve problems by examining givens and characteristics of the task, by thinking of possible and desirable goals and cognitive activities, and by taking account of prior knowledge, interest, capacities, and contextual factors. Self-judging is a motivational self-regulation activated related to orienting; indeed, orienting activities relating to a given task provide opportunities to assess one's personal qualities and competencies (e.g. prior knowledge and attitudes as a learner and problem solver. Self-judging is motivational in the sense that it helps students to make an accurate appraisal of the effort needed to accomplish a task successfully.[98]

To test the effect of this training, Masui and De Corte compared the students who had received the training to two control groups on two measures in a different course, statistics. To measure self-regulating, the students were asked how much they thought that they "would have to invest in the practical and theoretical and practical parts of the course" and to measure self judging, the student were asked whether they thought that the statistics course would be easy or difficult.[99] Based on results that showed that the students who had received the training did much better on both measures than the students in the control group, Masui and De Corte concluded that students who had received the training were able to transfer, or productively use, the acquired cognitive and motivational skills in a novel context.[100]

5. Deliberate practice

Finally, the National Research Council talks about the time that it takes for an individual to master a complex subject.[101] Although talent probably plays a role in who becomes an expert, it takes even talented individuals a great deal of time to develop expertise.[102] For instance, a number of individuals have estimated that it requires between 50,000 to 100,000 hours to become a world-class chess master.[103] Similarly, as

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[97] Chris Masui & Erik De Corte, *Enhancing Learning and Problem Solving Skills: Orienting and Self-Judging, Two Powerful and Trainable Learning Tools*, 9(6) LEARNING AND INSTRUCTION 517 (1999), *discussed in* Erik De Corte, *supra* note 50, at 144.

[98] De Corte, *supra* note 50, at 144.

[99] *Id.* at 144-45.

[100] *Id.* at 144.

[101] NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN, *supra* note 12, at 58.

[102] *Id*. (citing K. Anders Ericsson, Ralf Th. Krample & Clemens Tesch-Römer, *The Role of Deliberate Practice in the Acquisition of Expert Performance*, 100 PSYCH. REV. 363 (1993)).

[103] *Id.* at 56 (citing William G. Chase & Herbert A. Simon, *Perception in Chess*, 1 COGNITIVE SCI. 33 (1973)).

F.M. Shea has noted, law school is a three-year introductory course to "at least a decade of legal education."[104]

It is not, however, just how much time an individual spends learning. According to the National Research Council, learning is more effective when "people engage in 'deliberate practice' that includes active monitoring of one's learning experiences."[105] An important part of this deliberate practice is feedback: "students need feedback about the degree to which they know when, where and how to use to use the knowledge that they are learning."[106]

One way to help students learn when, where, and how to use the knowledge that they are learning is through the use of contrasting cases.[107] Contrasting cases can help individuals notice particular features that might have previously escaped their attention and to learn which features are, and are not, relevant to a particular concept.[108] For example, young children learn how to use the word "dog" by comparing dogs to cats, cows, and other animals, and adults develop learn about wines by comparing and contrasting two or more classes of wine side by side.

The following example illustrates the power of contrasting cases. Begin by describing Figure 1, which is taken from *Rethinking Transfer*.[109]

Figure 1

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[104] F.M. Shea, *Legal Education—For What? Changing Perspective, 1935-1961*, 12 BUFFALO L. REV. 270, 272 (1963), *cited in* Peter W. Gross, *On Law School Training in Analytic Skill*, 25 J. LEGAL EDUC. 261, 265 (1972-1973).

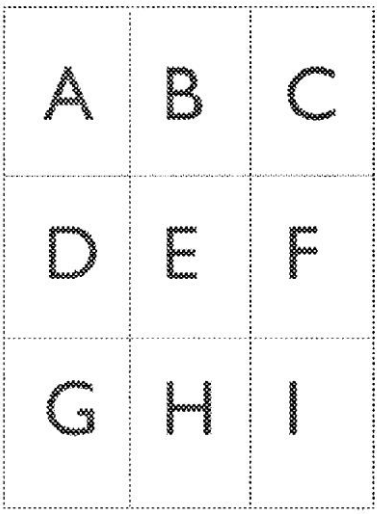
[105] NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN, *supra* note 12, at 58-59.

[106] *Id.* at 59.

[107] *Id.*

[108] *Id.*

[109] Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 71.



If you are like most of the individuals who have participated in studies involving Figure 1, you did not mention that each of the "parts" is the same size and shape.[110] If, however, you were presented with both Figure 1 and Figure 2, your descriptions would, more likely than not, mention the size and shape of the boxes,[111]

Figure 1

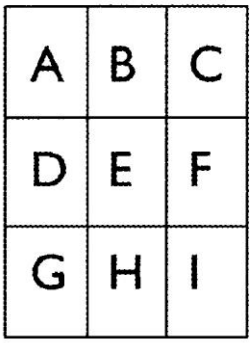
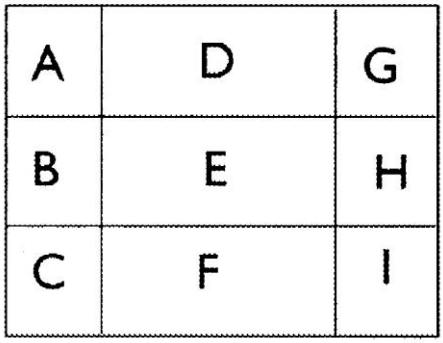


Figure 2



As this example illustrates, we often define an object in terms of the "field of alternatives"[112] Thus, according to Bransford and Schwartz, "[i]n Broudy's (1977) terms, the field becomes something that we 'know with'; it affects what we notice about subsequent events."[113]

[110] *Id*. (discussing the study from WENDELL R. GARNER, THE PROCESSING OF INFORMATION AND STRUCTURE (Lawrence Erlbaum Assoc. 1974)).

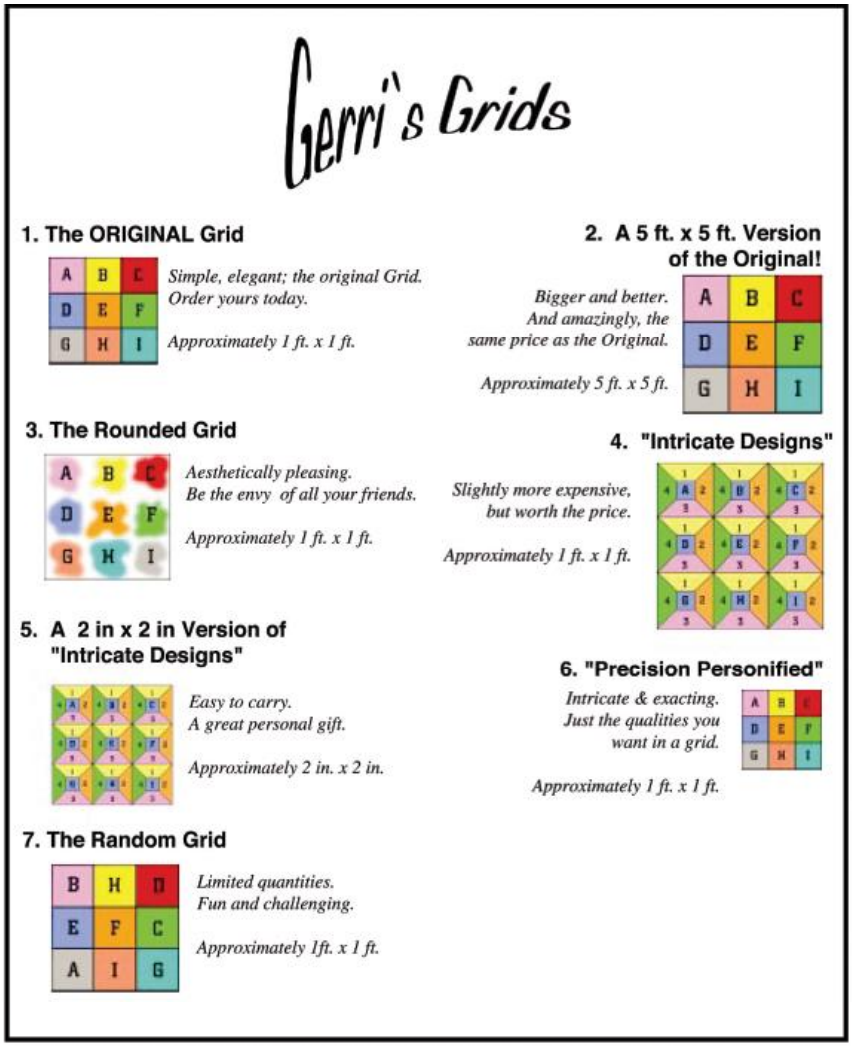
[111] *Id*.

[112] *Id*.

[113] *Id*. at 71-72.

What we notice, however, is also influenced by the questions that we are asked.[114] Look for example, at the following "advertisement."[115] Which features are the most important?

Figure 3



Without knowing how you would use the grids, it is difficult, if not impossible, to decide which features are the most important.[116] If, however, you are told to pick a grid

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[114] *Id.* at 72.

[115] *Id.* at 73.

[116] *See* Bransford et al., *Designs*, *supra* note 95.

for the back of a T-shirt designed to facilitate back scratching, you can come up with criteria for determining which features are most important.[116]

C. Adaptive Expertise[117]

As Schwartz, Branford, and Sears note, the classical definition of transfer and their broader definition have different focuses: while the classical definition is primarily concerned with efficiency,[118] the broader definition also looks at innovation.[119] Efficiency and innovation are not, however, mutually exclusive.[120] Thus, instead of treating efficiency and innovation as two separate continuums and trying to maximize efficiency or maximize innovation, Schwartz, Bransford, and Sears suggest that the goal should be to create a "optimal adaptability corridor."[121] The following diagram is from *Efficiency and Innovation in Transfer*.[122]

[116] *Id*., *cited in* Bransford & Schwartz, *Rethinking Transfer*, *supra* note 4, at 72-73.

[117] Giyoo Hatano may have been the first researcher to use the phrase "adaptive expertise." *See* Giyoo Hatano, *Cognitive Consequence of Practice in Culture Specific Procedural Skills*, 4 THE QUARTERLY NEWSLETTER OF THE LABORATORY OF COMPARATIVE HUMAN COGNITION 15, 15-18 (1982).

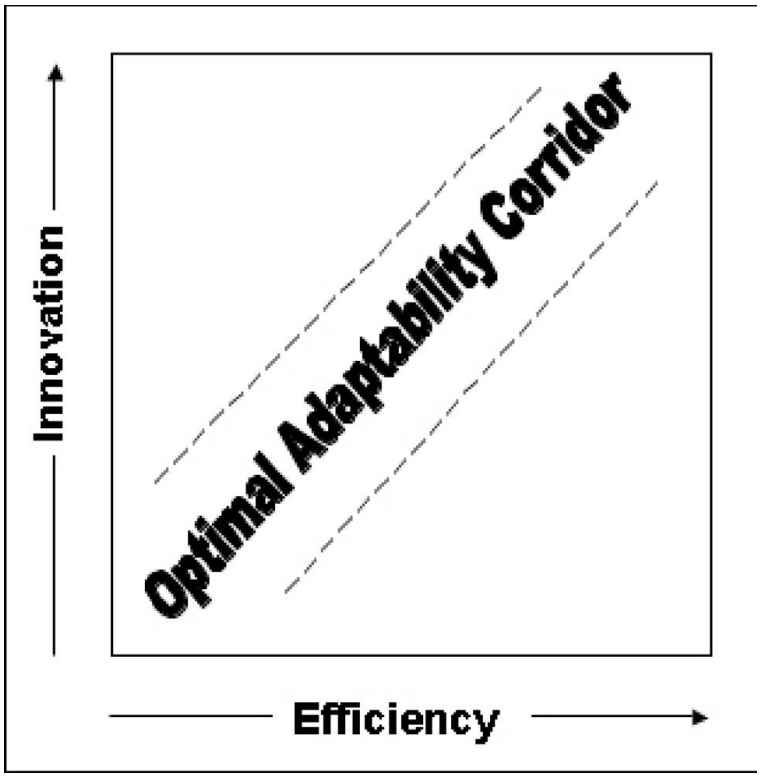
[118] *See* Bransford, Schwartz & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 4-5, 28-29.

[119] *See id.* at 29-34.

[120] *Id.* at 28, 30; *see also* Giyoo Hatano & Kayoko Inagaki, *Two Courses of Expertise*, *in* CHILD EEVELOPMENT AND EDUCATION IN JAPAN 262-272 (Harold Stevenson, Hiroshi Azuma, & Kenji Hakuta eds., W. H. Freeman 1986).

[121] Bransford, Schwartz & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 37.

[122] *Id.* at 38.



Schwartz, Bransford, and Sears's approach is attractive because it forces us to think beyond the established categories of learning and transfer and beyond efficiency and innovation. Although we need individuals who can solve routine, or commonly encountered, problems quickly and correctly, we also need individuals who can innovate, or construct solutions, to novel problems. For instance, although we need doctors who can quickly and accurately diagnose our child's ear infection, we also need doctors who can diagnose less common problems. Similarly, while we need to lawyers who had handle routine transactions, we also need lawyers who can handle those case that involve issues of first impression.

While there are a large number of studies that have examined the types of teaching methods that foster the development of routine expertise,[123] there are relatively few that have looked at the types of teaching methods that foster the development of adaptive expertise.[124] In one of these studies, Martin and Schwartz taught nine- and ten-year olds to solve problems involving fractions using either pie-shaped pieces, which made it easy for students to see the "whole," or rectangular-shaped tiles, which were

[123] *See, e.g.*, Richard S. Prawat, Promoting Access to Knowledge, Strategy, and Disposition in Students: A Research Synthesis, 59(1) Review of Educational Research 1 (1989).

[124] *See, e.g.*, Susan M. Barnett & Barbara Koslowski, *Adaptive Expertise: Effects of Type of Experience and the Level of Theoretical Understanding It Generates*, 8(4) THINKING AND REASONING, 237, 258 (2002).

more difficult to see as a whole.[125] To determine the effect that these different initial learning experiences had on subsequent learning, at the end of each day the researchers had both groups of children solve problems that involved different materials.[126] For example, they asked the children to solve problems using bars, which are analogous to the pie-shaped pieces in that it is easy to see the whole, and using beans, which are analogous to the tiles.[127]

The students were tested on two measures: (1) whether they gave the right answer, a measure of efficiency, and (2) whether they arranged the pieces correctly, a measure of innovation.[128] Although the students who worked with the pie-shaped pieces did better at first, their learning curve was much less stable: they often got stuck and, from one day to the next, they often regressed.[129] In contrast, the students who worked with the tile-shaped pieces had a much more stable learning curve: they rarely got stuck, and they were much less likely to regress from one day to the next.[130] Thus, this study suggests that early innovation produces more innovation in the short run and better efficiency in the long-run.[131] See the following diagram, which is taken from page 40 in *Efficiency and Innovation in Transfer*.[132]

[125] Taylor Martin & David L. Schwartz, *Physically Distributed Learning: Adapting and Reinterpreting Physical Environments in the Development of Fraction Concepts*, 29 COGNITIVE SCI. 587, 587-625 (2005), discussed in Bransford, Schwartz & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 39-41.

[126] *Id*.

[127] *Id.*

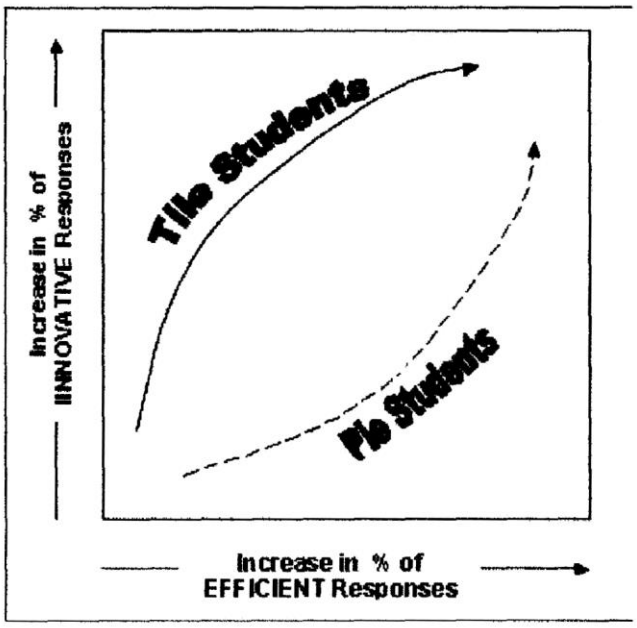
[128] *Id*.

[129] *Id.*

[130] *Id.*

[131] *Id.*

[132] Bransford, Schwartz & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 40.



While there are very few studies that look methods for helping students develop adaptive expertise, there are number of studies that compare the ways in which novices, usually college students, and experts solve problems. In one of the most famous of these studies, Chi, Feltovich, and Glaser compared the way in which experts and novices solved physic problems.[133] What they discovered is consistent with the theories related to transfer. While the experts tended to use theories to categorize the problems the novices categorized the problems based on their surface features.[134] In another study, Barnett and Koslowski read college students and two types of experts, business consultants and restaurant managers, a story about a hypothetical restaurant and then asked four open-ended questions related to challenges facing the restaurant.[135] Although the business consultants did not have experience working in or with restaurants, they did substantially better on the reasoning problems than the restaurant managers, who did only slightly better than the college students.[136] In discussing their findings, Barnett and Koslowski conclude that the experts did not successfully transfer their expertise to the novel problems because they were "bound by the specifics of their own experience . . . ."[137] In

[133] Michelene T. H. Chi, Paul Feltovich & Robert Glaser, *Categorization and Representation of Physics Problems by Experts and Novices*, 5 COGNITIVE SCI. 121, 121-22 (1981).

[134] *Id.* at 144-47.

[135] Barnett & Koslowski, *supra* note 125, at 240.

[136] Barnett and Koslowski compared each individual's responses to responses from two super-experts, professors whose work focused on restaurant management and who had previously managed restaurants. *Id*. at 242-43.

[137] *Id.* at 247.

contrast, the business consultants, who engaged in more theory-based reasoning, were able to transfer what they knew to the new problems.[138]

Other studies highlight other differences between experts and novices. For example, individuals with adaptive expertise seem to understand the limits of their own expertise and, when they do not possess the requisite expertise, they either research the issue or seek out individuals who do have that expertise.[139] In one article, Sam Wineburg compared the results of two studies: one in which he asked two groups of college students, history majors and non-history majors, to interpret some complex decisions made by Abraham Lincoln, and another in which he asked two American history experts, one who specialized in the Civil War and one would did not, to do the same.[140] Although the college students showed a high degree of confidence in their interpretations, their interpretations were flawed because they based their interpretations on assumptions based on their own experiences.[141] In contrast, the second history expert realized that he did not know enough Civil War history to interpret Abraham Lincoln's decisions and, after careful rereading, created a context within the passages to answer his own questions.[142]

The studies also show that novices sometimes get worse before they get better. In a study involving medical students, Lesgold et al. found that, on some tasks, residents with three to four years of experience performed worse than medical students and more experienced residents.[143] According to Lesgold, an imperfect framework or theory may be worse than no framework or theory, even if having an imperfect theory may be a necessary step toward building a better theory.[144]

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[138] *Id*. at 245-46; *see also* K. Dunbar, *How Scientists Really Reason: Scientific Reasoning in Real-World Laboratories*, *in* THE NATURE OF INSIGHT 365 (Robert J. Sternberg & Janet E. Davidson eds., M.I.T. Press 1995); James F. Voss, Terry R. Greene, Timothy A. Post & Barbara C. Penner, *Problem-Solving Skill in the Social Science*, *in* 17 THE PSYCHOLOGY OF LEARNING AND MOTIVATION: ADVANCES IN RESEARCH THEORY 165 (Gordon H. Bower ed., Academic Press 1983).

[139] *See* NATIONAL RESEARCH COUNCIL, HOW PEOPLE LEARN, *supra* note 12, at 47-48; *Efficiency and Innovation in Transfer*, *supra* note 9, at 30-31.

[140] Samuel S. Wineburg, *Reading Abraham Lincoln: An Expert/Expert Study in the Interpretation of Historical Texts*, 22(3) COGNITIVE SCI. 319, 221, 338 (1998), citing Samuel S. Wineburg & Janice E. Fournier, *Contextualized Thinking in History*, in COGNITIVE AND INSTRUCTIONAL PROCESSES IN HISTORY AND THE SOCIAL SCIENCES 285, 285-308 (Mario Carretero & James F. Voss eds., Lawrence Erlbaum Assoc. 1994).

[141] *Id*. at 338.

[142] *Id*. at 336-37. In other words, as Wineburg puts it, "[n]ovice readers encounter the past in primary documents and judge it. [Experts] encounter the past… and learn from it." *Id*. at 338. *See also* Blasi, *supra* note 6, at 344-45.

[143] Alan Lesgold, Harriet Rubinson, Robert Glaser, Dale Kloppfer, Paul Feltovich & Yen Wang, *Expertise in a Complex Skill: Diagnosing X-Ray Pictures*, *in* THE NATURE OF EXPERTISE 311 (Michelene T. H. Chi, Robert Glaser & M.J. Farr eds., Lawrence Erhbaum Assoc. 1988)

[144] *Id*. *See also* Anette Karmiloff-Smith & Barbel Inhelder, *If You Want to Get Ahead, Get a Theory*, 3(3) COGNITION 195, 195-212 (1974).

In summary, these studies, and others like them, suggest that individuals with adaptive expertise have the following characteristics.

1. They have a deep knowledge of their subject area.

2. They recognize patterns of meaningful information. For example, if a novice chess player and an expert chess player are shown a chess board with the chess pieces in acceptable positions for a few seconds, the expert chess player will do a better job replicating the configuration than the novice.[145] However, if the chess pieces are placed on the board in a random way, the expert will not do any better than the novice.[146]

3. They are able to recognize the patterns because they focus on structures and not just surface features. For example, while the novice chess player may focus at least part of his or her attention on the materials from which the pieces are made, the expert would not. Instead, the expert would try to match the configuration to a configuration that he or she knows.[147]

4. They can access their knowledge because they know not only information but also when that information is useful.

5. They are willing to question and even let go of initial assumptions.

6. They actively seek out information that they need to solve a problem.

Part III: New Task

Presume for a moment that you have been asked to have been asked to teach a group of first-year law students about adverse possession. Spend some time evaluating the first three class plans and developing your own alternative.

Plan A: Lecture

Before class, have students read the section on consideration in a property hornbook and write a one- to two-page summary of what they have read.

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[145] Chase & Simon, *supra* note 103.

[146] *Id.*

[147] *Id.*

In class, present a lecture in which you explain the key principles and describe cases in which the courts have applied those principles.

Plan B: Casebook Method

For each class, have students read several cases. In class, question the students, asking them to summarize the key facts, to set out the issue, and to explain and evaluate the courts' holdings and reasoning.

Plan C: Casebook Method plus Lecture

For the first one or two classes, have students read cases. In class, have students identify and discuss any interesting patterns that they have noted. In the last class, lecture: explain the key principles and summarize/explain the cases that the students read and analyzed.

Plan D

Given the research and your own experiences, devise another method that might help students develop both the routine and adaptive expertise that they will need to handle adverse possession cases?

Part IV: A Critique of Law School Teaching Methods

More likely than not, there is not a single method that will be effective in teaching law students not only the law but also how to think like a lawyer. Unlike fairy godmothers, law school professors do not have magic wands that they can use to turn law students into competent, let alone lawyers with adaptive expertise. That does not, however, mean that law professors should not do what Langdell did and innovate.

E. Critique of Plan A (Lecture)

Plan A is, essentially, Detterman's plan. While Detterman taught his psychology students the basic principles of psychology and then used examples to illustrate those principles, a law professor would teach his or her students legal principles and use cases or hypotheticals to illustrate those principles. According to Detterman, the primary advantage of this method is that it does not rely on transfer.[148] Instead of hoping that students will transfer what they have learned or using "tricks" to enhance transfer, Detterman and the law professor would simply teach their students what they want them to know.

At least in theory, the law professor could use this method not only to teach students the law but also to teach them the analytical and other skills they will need in practice. For example, a professor could describe the process of reading, analyzing, and

[148] *See* Detterman, *supra* note 12, at 17.

cases, then provide students with examples of how others have read, analyzed, and briefed a group of cases. Similarly, a professor could explain to how to construct an argument and then provide the students with examples of arguments.[149] A number of studies suggest that this method works, that students do, in fact, learn from lectures, particularly when those lectures are followed by concrete examples.[150]

There are, however, some problems with the approach. Although reading assignments and lectures may be an efficient way providing students with information, the research indicates that students remember very little of what they read and hear. (Think Five-Minute University.) In addition, even when students remember what they read and hear, it is unlikely that they will be able to apply that information to similar, let alone novel, situations. As most UCC professors will attest, students seem to remember very little of what they learned in their Contracts course and, unless specifically prompted to do so, they do not apply the principles, or underlying structures, that they learned in Contracts to solve the problems that they encounter in Sales. (Think fortresses and tumors.) More importantly, though, Plan A violates one of Detterman's primary principles: Detterman believes that you should teach people exactly what you want them to learn in a situation as close as possible to the one in which the learning will be applied.[151] Teaching students legal principles in a law school classroom is very different from teaching students how to practice law.

B. Critique of Plan B (The Casebook Method)

In many ways, the casebook method is a product of its times.

> In the postbellum era, American universities were influenced by European scholarship that emphasized the "scientific method" and the pursuit of objective or universal truths. Seeking a place in the new universities, law schools, led by Langdell, recognized that they would have to conform to this new model of a university discipline. In sum, legal scholarship and education had to become "scientific."[152]

Thus, Langdell viewed law as a science and carefully selected appellate court decisions as the "specimens" from which students could, through the

[149] This is easier said than done. As those who have tried can attest, it is very difficult to "deconstruct" the processes that attorneys use in reading statutes and cases, in developing a theory of the case, or in constructing arguments.

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[151] *See* Detterman, *supra* note 12, at 17.

[152] Keith A. Findley, *Rediscovering the Lawyer School: Curriculum Reform in Wisconsin*, 24 WIS. INT'L L.J. 295, 297-98 (2006) (footnote omitted).

scientific method, discover general principles.[153] In addition, Langdell advocated the use of what often-referred to as the Socratic method: instead of lecturing, Langdell would ask students questions designed to help them identify not only the specifics of each case but also more general legal principles.[154]

However, from the very beginning, Langdell's methods were controversial.

> As the enrollments in Langdell's case-method courses tumbled to a few students, President Eliot took the extraordinary step of calling students, including Fessenden, into his office to ask their opinion of Langdell's classes. "Fessenden, a first-year student of about three months, was flabbergasted, but he swallowed his astonishment and said, 'Well, Mr. President, I can go to Prof. Washburn's lectures and hear him read a chapter from his book on real property. I can go to Prof. Parson's lectures and hear him read a chapter from his book. But I learned to read before I came down here. When I go to Prof. Langdell's lectures, I get something that I cannot find in any book.[155]

The question, of course, is what is that "something" that students get that they cannot find in any book?

The data analysis plus review of data analysis condition and the casebook methods are similar in that they both require students to work with primary source material. While the psychology students looked at studies, law students work with statutes, court rules, and court opinions. In addition, the methods are similar in that they require the students to do both analysis and synthesis. The psychology students engaged in analysis when they analyzed and graphed the data and in synthesis when they looked for interesting patterns. Similarly, law students engage in analysis when they brief a case, identifying the key facts, the issue, the court's holding, and the court's reasoning, and they engage in synthesis when they prepare outlines. Finally, the methods are similar in that there is no lecture that tells the students what they should have learned from

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[153] Kara Abramson, *Art for a Better Life: A New Image of American Legal Education*, 2006 B.Y.U. EDUC. & L.J. 227 (2006). Langdell's innovations in 1870 at Harvard Law School have been traced to "[Charles] Eliot's travels to Europe in 1863 to observe educational systems on the Continent and, in particular, medical education and its clinical paradigm." Marc Feldman & Jay M. Feinman, *Legal Education: Its Cause and Cure*, 82 MICH. L. REV. 914, 919 (1984) (reviewing ROBERT STEVENS, LAW SCHOOL: LEGAL EDUCATION IN AMERICA FROM THE 1850S TO THE 1980S (University of North Carolina Press, 1983)).

[154] Abramson, *supra* note 153, at 230.

[155] Kimball, *supra* note 3, at 298 (citing Letters between Eliot and Fessenden (19 Mar 1919, 28 Mar 1919, 23 Apr 1919, 12 May 1919, 15 Jul 1919, 22 Jul 1919), *Charles W. Eliot Papers*, Harvard University Archives, box 382). For more current critiques of the method, see Phillip C. Kissam, *The Ideology of the Case Method/Final Examination Law School*, 70 U. CIN. L. REV. 137 (2001); Llewellyn, *supra* note 2; Edwin W. Patterson, *The Case Method in American Legal Education*, 4 J. LEGAL EDUC. 1 (1951); James B. White, *Doctrine in a Vacuum*, 36 J. LEGAL EDUC. 155 (1986).

working with the data or from briefing the cases and preparing outlines. The psychology students were simply told to look again at the data to see if they had missed anything, and law students are told that they need to review the cases in light of class discussions of those cases.

There is, however, a key difference between the two methods. While in Schwartz, Bransford, and Sears' studies the psychology professor did not guide the students through the process of analyzing and graphing the data or through the process of looking for interesting patterns, most law professor do provide at least some guidance. At one end of the continuum are those law school professors who take Detterman's approach and teach their students how to analyze and synthesize statutes and cases through lectures and examples. At the other end are professors who simply tell students to read the cases and then use class time to ask their students questions about those cases.[156] Whichever method the professor uses, the question is whether the law school professor's involvement in the data analysis activity is sufficient to make the casebook method more effective than Schwartz, Bransford, and Sears's data analysis plus review of data analysis condition, which, as is noted above, produced little transfer.[157]

In one of the handful of studies that looked at what law students learn in law school,[158] Bryden compared third-year law students and entering first- year law students at three highly ranked law schools on three measures: (1) the ability to do functional analysis, that is "the ability to determine the meaning or scope of a rule or category by reference to its purpose," (2) the ability to distinguish between the court's holding and dicta, and (3) the ability to do statutory analysis.[159]

On the first measure, the ability to do functional analysis, the third-year law students did substantially better than the entering first-year students. At School 1, about half of the third-year students did some type of functional analysis; at School 2, 43% of

[156] Experience indicates that the types of questions that professor ask vary dramatically. While some professors walk their students through the same set or sets of questions for each case, others may ask one set of questions for one case and a different set of questions for another case. In addition, while some professors ask very specific questions that are designed to make sure that the students have done a close and critical reading of the case, other professors ask broader questions that ask students to examine the policies underlying a particular doctrine. What most professors have in common is that they do not ask their students the types of questions that practicing attorneys ask themselves when they read a case. For example, most law school professors do not ask their students how they would advise their clients, how they would draft a particular document, or how, if they ended up in litigation, they would use the cases to support their position.

[157] See chart, *supra* note 70 in Part II, Section (b) above.

[158] *See, e.g.*, Morrison Torrey, *You Call that Education?*, 19 WIS. WOMEN'S L.J. 93 (2004); Paul F. Teich, *Research on American Law Teaching: Is There a Case Against the Case System?*, 36 J. LEGAL EDUC. 167, 181 (1986).

[159] Bryden, *supra* note 4, at 479. Bryden controlled for substantive legal knowledge by providing the students with hypothetical statutes and cases. *Id.* at 484. In addition, he selected entering first-year students who had the same LSATs as the third-year students who took the test. *Id.* at 482.

the students who took "Exam A" did some type of functional analysis, and 30% of the students to took "Exam B" did some type of functional analysis; and at School 3, 36% of the third-year students who took Exam A did some type of functional analysis, and 30% of the students who took Exam B did some type of functional analysis.[160] In, contrast, the numbers for the entering first-year students ranged from 0% to about 10%.[161] While this pilot study indicates that law schools do help students learn how to do functional analysis, as Bryden notes, "even at an excellent law school at least half of the graduates have not acquired this habit."[162]

On the second measure, the ability to distinguish a court's holding from dicta, Bryden's results are inconclusive, in large part because the questions were not drafted in such a way that students needed to distinguish between the court's holding and dicta.[163] However, of those third-year students who do Exam A, on 5% of the third-year students at School 1, 17% of the third-year students at School 2, and 20% of the third-year students at School 3 mentioned that, in one of the decisions, the court's reference to the applicable exception was in dictum.[164] On the second exam, Exam B, 28%, 20% and 30% of the students made a statement that suggested that the key sentence in one of the cases was dictum.[165] Because the entering first-year students "could not have made such a technical point," Bryden did grade them on this point.[166]

On the third measure, the ability to construe a statute, the third-year students did better than the entering first-year students.[167] However, as with the other two measures, in many instances fewer than half of the third-year students saw an issue or did the type of analysis that Bryden wanted. For example, most of the entering and third-year students who took Exam A failed to discuss one of the applicable statutory sections, and only 10% of the entering students and 25% of the third-year students recognized an issue related to that section.[168] Similarly, on Exam B, the third-year students did better than the

[160] *Id.* at 491.

[161] *Id.* at 489-91.

[162] *Id.* at 491.

[163] *Id.* at 494.

[164] *Id.* at 492.

[165] *Id*. at 493 n.51.

[166] *Id.*

[167] *Id*. at 494-500.

[168] *Id*. at 494-98.

entering students.[169] For instance, while one-third of the third-year students talked about what one of the words in the statute might mean, only 15% of the entering students did.[170]

Interestingly, others have not tried to replicate or improve upon Bryden's study.[171] As a consequence, the only other measures that we have our the statements that our students make in class; our students' answers on exams; the work that they do in their legal writing courses, trial advocacy courses, clinical courses, and externships; their performance on the bar exam, and the work that they do as they move out into practice.

As Bryden observes, measuring our students learning based on the statements that make in class or on the basis of their exam answers is problematic.[172] Classroom responses tend to measure preparation rather than the ability to do a particular type of analysis, and the results may be skewed by the fact that many professor rely on volunteers, individuals who have raised their hands because they believe that they "know the answer."[173] In addition, according to Bryden, "[n]ew teachers quickly discover that on the whole students do badly on law school exams."[174]

Better measures may be the work that students do in their legal writing and other "skills" courses. While no data is available, most legal writing professor would probably agree that their students do better on the last memo or brief than they do on their first memo or brief. By the last assignment, students are doing more functional analysis, they are doing a better job distinguishing between the court's holding and dicta, and they do a better job of analyzing a statute. However, most legal writing professors would also agree that all but a few of their students struggle to do high-quality analysis. Even at the end of their first or second years, many students do not distinguish between the roles that the trial and appellate courts play; do not understand the standard of review; do not, unless prompted, do a systematic analysis of the rules; and have a difficult time constructing plain language, analogous case, and policy arguments. While on the surface, the bar exam seems to be the best method, it is suspect for two reasons. First, like most large-scale tests, it is constructed in such a way that, no matter how well or how

[169] *Id*. at 498-500.

[170] *Id*. at 499.

[171] Some articles have explored the themes of Byden's study. *See, e.g.* Paul T. Wangerin, *Skills Training in "Legal Analysis": A Systematic Approach*, 40 U. MIAMI L. REV. 409, 415 (1986) (describing a systematic method for teaching first year law students dialectical skills).

[172] *Id.* at 480.

[173] *Id*.

[174] *Id.*

poorly students do, a prescribed percentage will pass.[175] Second, the bar exam may test knowledge of the law and not whether students can think like a lawyer.[176]

The research on learning and transfer does, however, highlight the strengths and weaknesses of the casebook method. When analyzed under the classical definition of transfer, the casebook method gets low marks. Because most legal problems are ill-structured, very few students will be able, at least without a lot of hints, to use the principles that they draw from a group of cases to work through hypotheticals that their own professors present let alone use those principles in other classes or in practice. This failure to transfer is compounded by the fact that students seem to contextualize what they learn: As the studies indicate, students do not use the skills that they learn in math classes to solve real world problems.[177] While the casebook method may help students focus on underlying structures rather than simply the facts of the case, the method is time consuming. Thus, instead of hoping for transfer, proponents of the classical model of transfer would urge law school professors to follow Detterman's and not Langdell's approach.

Under the broader definition of transfer, the casebook method fares much better. One of the casebook method's strengths is its use of contrasting examples. According to Bransford and Schwartz, presenting individuals with more than one example "changes the field of alternatives," which in turn changes what the individual notices. Thus, the authors of casebooks can highlight particular principles, or the ways in which those principles have been applied through their selection of cases and, in particular, through their selection of contrasting cases. In addition, law school professors can change what students notice about a particular case through their use of questions. Just as asking subjects which design would work best for the back of a t-shirt designed to facilitate back scratching changed what students notice about various designs, professors can change the way students read a case through their choice of questions.

Another strength is the casebook method's focus on theory. Under both the classical and broader definition of transfer, transfer is more likely to occur when individuals focus not only the surface features of a problem (for example, the facts of a case) but also on its underlying structure (the principles that the case illustrates). Thus, to the extent that law students go beyond analysis and engage in synthesis, they are more likely to be able to apply the principles that a group of contrasting cases was designed to illustrate to a novel problem. Likewise, the casebook method's focus on theory may help law students develop adaptive expertise. Just as business consultants were able to use

[175] Sam Wineburg, *Crazy for History*, 90(4) J. AM. HIST. 1401, 1406-07 (2004).

[176] *See, e.g.*, Daniel R. Hanson, Note, *Do We Need the Bar Examination? A Critical Evaluation of the Justifications for the Bar Examination and Proposed Alternatives*, 45 CASE W. RES. L. REV. 1191, 1213, 1220 (1995) (bar exam rewards applicants who can recite memorized law but does not test higher level thinking skills).

[177] *See supra* note 11 and accompanying text.

theory and causal reasoning to solve novel problems, law students who use theory and causal reasoning may be able to do a better job representing their clients.[178]

Also on the plus side is the fact that, in their study, Bransford and Sears found that students who have been required to innovate from the very beginning have a more stable learning curve and, in the long run, do better on measures of adaptive expertise. Just as Martin and Schwartz's students had to innovate to see the tiles as parts of a whole, law students have to innovate to construct a body of law from a series of individual cases.[179] Finally, on the plus side is the fact that the Socratic method can create the type of disequilibrium that forces students to re-examine their assumptions and create new knowledge structures.[180]

While the current research suggests that the case book method is more effective than just a lecture or even a lecture followed by concrete examples, many students would argue that, even if the casebook method is better than the lecture method, many professors do not use the method effectively. Instead of using questions to create a disequilibrium that will allow students to view an issue through a new lens or to highlight differences between contrasting cases, the professors ask what appear, at least to many students, to be random sets of questions. Although the professor may have a rationale for the way in which he or she walks students through cases, that rationale is not communicated, either indirectly or directly, to the students. Thus, students complain that the professor is "hiding the ball" when, in fact, what the professor may be hiding is the method.

However, even when the law professor explains the method and uses it skillfully, students may complain that what they are learning in the classroom does not prepare them to practice law: The questions that their professors ask them are not the same questions that they will need to answer if they are to answer a client's question, draft a document, or mediate a dispute. To some extent, the students are wrong. The questions that many law school professors who teach first-year classes ask are related to practice in that they are designed to familiarize first-year students with the legal system, its rules, and language. The students are, however, in large part right. In most law schools, the focus is not on teaching students how to practice law. As a consequence, students are taught to view legal questions from an academic rather than a practical perspective and left on their own to figure out how to transfer what they have learned in law school to their practice.

[178] *See supra* notes 136-39 and accompanying text.

[179] *See supra* notes 126-132 and accompanying text.

[180] Schwartz, Bransford & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 32.

C. **Critique of Plan C (Casebook Plus Lecture)**

The casebook plus lecture method is, in a modified form, the method that Schwartz, Bransford, and Sears found works best. A law professor who adopts this method would divide each "unit" into two parts: a "data analysis" exercise and a lecture.

While the data analysis exercise could take a number of different forms, it could be the casebook method. Law professors would have students read and brief a set of cases and then, in class, the professor would question the students about the cases, asking questions that force students to engage in analysis, for example, reading cases closely and critically, and in synthesis, for example, drawing principles from cases by comparing and contrasting cases. The professor's use of the casebook method would not, however, be an end in itself. Instead, the professor would use the casebook method to prepare students for future learning: learning from a lecture in which the professor explains the cases and the principles that might be drawn from those cases.[181]

There are, of course, some problems with this suggested method. For instance, knowing that the professor would provide a lecture at the end, some students might choose to forgo doing the reading or forgo engaging in the analysis and synthesis. There are two ways of responding to this potential problem. First, if students understood the process and the importance of the data analysis exercise, they might be less likely to wait for the lecture. Second, the students who are likely to try shortcuts are probably already doing so: Instead of reading and briefing the cases they rely on commercially prepared case summaries and, instead of preparing their own outlines, they rely on outlines produced by others.

Some of the advantages of this plan can be seen if law school and bar review courses are viewed as a single learning experience. One way of explaining the "ah ha" moments that many students have while studying for the bar is that the three years of law school and the casebook method were a data analysis exercise that prepared students to learn from the bar review summaries and lectures. Although these students would have gotten little from these summaries and lectures as first-year students, law school prepared them for future learning: In addition to teaching students facts (replicative knowing) and procedures (applicative knowing), law school provide students with the experiences and learning that determine what they notice about new situations and how they frame the problem (interpretive knowing.) As a result, even if students are not able to "transfer out" all of the principles that they learned during law school, they "transfer in" interpretive knowledge, which allows them to learn the material being taught in the bar review course.[182] In the alternative, the "ah ha" moments can be explained in terms of relearning. Although students may not remember learning the material the first time,

[181] Some professors already use this method. After walking students through a series of cases, they provide students with a summarizing lecture. In the absence of such a lecture, other students seek out the equivalent information either in a hornbook or a study guide.

[182] Schwartz, Bransford & Sears, *Efficiency and Innovation in Transfer*, *supra* note 9, at 11.

they did in fact learn something that now enables them to relearn the same more quickly and, perhaps, from a new perspective.[183]

The question, of course, is whether Plan C, the data analysis plus lecture method, prepares students for the practice of law. The answer is probably the tried and true law school response: it depends.

It depends first on whether the method does in fact work. Although students who have taught by the data analysis plus lecture model have done better on classroom exercises and tests than students taught through other methods, to date there are no published studies that have looked at whether the students who have been taught by the data analysis plus lecture method can transfer what they have learned in the classroom to the world of work. While Detterman would argue that these students will not be able to transfer what they have learned, Schwartz, Bransford, and Sears would argue that, at a minimum, students will be able to transfer in what they learned and that they can use that learning to facilitate additional learning.

More likely than not, whether the method works also depends on the types of data analysis exercises that students are given and the nature of the lecture. At least in theory, data analysis exercises that resemble, in some authentic way, a problem that an attorney might face in practice are more likely to produce learning that can transfer to practice than exercises that are more academic in nature. At least for second-semester and upper-division students, problems like those presented in Georgetown's Week One program[184] and Stanford's new curriculum[185] are more like to result in transfer than the more typical case analysis classes. In addition, for the lectures "to work," they will need to do more than just summarize cases: professors will have to present the principles, the reasoning that has led to the development or modification of those principles, and how those principles might be applied in practice.

D. Critique of Plan D

Like Plan C, Plan D rejects the classical definition of transfer and adopts the broader definitions that assume that knowledge is constructed and that transfer needs to be viewed in terms of preparation for future learning. In addition, Plan D has as its goal helping students develop not just routine expertise but also adaptive expertise.

1. Description of Plan D

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[183] *Id.* at 14.

[184] For a description of Week One: Law in a Global Context, see http://www.law.georgetown.edu/documents/weekone2006.pdf (last checked Feb. 17, 2007).

[185] *See* Press Release, Stanford Law School, A "3D" JD: Stanford Law School Announces New Model for Legal Education (Nov. 28, 2006), *available at* http://www.law.stanford.edu/news/pr/47/ (last checked Feb. 17, 2007).

Because few first-year students have had experience working with the law, law schools should prepare their students for law school by offering an orientation program that emphasizes the basics, for example, data analysis exercises that prepare students to learn about the roles the various branches of government play in the United States legal system, about the differences between trial and appellate courts, and about the types of arguments lawyers make. One way of doing this would be to present students with a problem and have them draft a statute that would solve that problem. Once the statute has been "enacted," student would be given a new fact pattern and be given the task of using their statute to advise their client about what the client can and cannot do under this new statute. The students could then litigate a case involving that statute, playing both the roles of the attorneys and the roles of trial and appellate judges. While the students would, undoubtedly, make what law professors and practitioners would label as "mistakes," the professors could use those mistakes as catalysts for future learning.

Building on the students experiences with these 'data analysis" exercises, law schools could provide their students with lectures that provide first-year students with what might seem like very basic information. For instance, using the exercises as starting points, the lectures can correct students' misconceptions about the roles that the three branches of government play, the relationships between the federal and state systems, the role of trial courts and appellate courts, and the different types of legal analysis and legal arguments.

With this foundation, first-year students would then be prepared to begin their regular courses. Relying on existing research, law school professors would change the ways in which they teach these classes in small but important ways. In teaching students a particular doctrine, law school professors would walk students through four steps that are designed to enhance both learning and transfer.

Step 1: Preparation for learning

Instead of starting a particular "unit" with a set of cases or a lecture, the professor would have his or her students do an exercise that requires students to explore the area of law or concept. For example, relying on Bransford and Sears' research, the professor might have the students read two or three short cases and note interesting patterns. In the alternative, the professor could try to create less academic exercise that not only prepares students for future learning but also demonstrates how experts approach a problem when they do not know the answer. For instance, the professor might tell the students that they are scheduled to meet with a client who has a question related to the area of law or concept that the students are about to study. What would an expert do in the same situation? What resources would the expert employ in preparing for the interview? What questions would the expert ask during the interview? Taking yet another approach, the professor might create an exercise that contextualizes the issues that the students are about to study by presenting the student with a case similar to one that they are likely to encounter in practice and asking students to talk about possible outcomes.

Step 2: Analysis of the statutes and cases

The next step would be to have the law students read the cases in their casebooks. Early in the first year, the professor's primary role would be similar to that of a skilled chess player teaching someone to play chess. Just as the chess teacher might begin by describing the chess board and explaining the moves that each piece can make, the law professor would describe the legal system and the roles that attorneys, trial judges, and appellate judges play within that system. Similarly, just as the chess teacher would help the new player learn what to look for on the chess board and teach the new players some of the most common moves, the law professor would help students learn what to look for in statutes and cases and help students learn to recognize common legal strategies.

Once the students have mastered the basics, both the chess teacher and the law professor can move to teaching their students more sophisticated strategies. In doing so, the professor would, however, want to use teaching techniques that are likely to promote both transfer and the development of adaptive expertise. Thus, professors would emphasize the underlying structures, not only of the opinions themselves, but also of the legal system and the particular area of law. For instance, once the students have read and analyzed a group of cases, the professors would help the students synthesize the group: Did each of the courts apply the same rule? How are the rules the same or different? Did all of the courts employ the same reasoning? How is the reasoning in one case the same or different as the reasoning in other cases? What are the pros and cons of each line of reasoning?

Step 3: "Lecture"

At the end of the unit the professor would help the students "interpret" what they have just learned. Although the professor could do this through a lecture, the professor could also choose to use questions Regardless of the approach, the professor would focus not on the "surface features" of particular cases but on "underlying structures." For example, the professor would make sure that students understand the how a particular doctrine is related to other doctrines, the policies underlying the doctrine, the doctrine itself, and what facts are legally significant and which aren't. In addition, the professor would work with students to help them develop both routine and adaptive expertise. To help students develop routine expertise, the professor would walk the students through numerous examples of routine case; to help students develop adaptive expertise the professor would present students with novel cases and model for them the ways in which an expert attorney might approach the case.

Step 4: Transfer Activity

This last step would be designed to help students transfer what they have learned. These exercises should be designed not only to help students transfer what they have learned to other problems that they will encounter in law school (for example, on their exams) but also to transfer what they have learned to problems that they will encounter in practice. At least initially, the focus of these exercises should be on helping students develop routine expertise. When they are presented with a routine problem, can they

identify the issue? Do they know the rule? Can they apply the rule? Can they make the standard types of arguments? Once students have demonstrated routine expertise, they can be presented with more novel problems that require them to innovate new ways of reading or applying the law and to use the strategies that experts use when they do not know the answer to a question.

2. Critique of Plan D

Plan D is, for the most part consistent with the research relating to learning, transfer, and the development of routine and adaptive expertise. While it recognizes the importance of providing law students with a body of knowledge, it also recognizes that unless students are prepared to learn that information, they remember little of what they read or told. Thus, relying on Schwartz, Bransford, and Sears's work, it incorporates exercises designed to prepare students for learning. In addition, relying of Schwartz, Bransford, and Sears's work, it recognizes that, when students have been prepared to learn, lectures can be effective.

Plan D also incorporates many of the techniques that have been show to promote transfer. Under Plan D, professors would provide their students with multiple examples and focuses students not only on the surface features of particular cases or doctrines (for example, the facts in a particular case or the black letter law) but also on their underlying structures (for example, the policies underlying a particular doctrine.) Plan D also helps promote transfer by presenting problems not in a school context but in the context that students will encounter them in practice.

Finally, Plan D helps students develop both routine and adaptive expertise. Professors can provide students with protocols that they can use to solve routine problem and practice in applying those protocols. However, professors can also help students develop the habits that they will need to develop adaptive expertise by helping students recognize the complexity of the law, by helping them challenge their assumptions, and by showing students how to learn new materials and construct or invent new solutions to problems. If done well, the first-year curriculum would prepare students not only for the more doctrine-intensive upper division classes but also practice.

There are, of course, downsides to the method. The first is that it requires professors to change, in varying degrees, how they are teaching their courses, and change requires both a willingness to engage in invention and time and energy.

The second is that Plan D requires more time than a lecture or the traditional case method. It will take professors time to create high quality data analysis and transfer exercises and, while some of the exercises could be done outside of the classroom, some of them will need to be done in the classroom, which will take up something that is in short supply: class time. The best response to this argument is a reference back to the Five-Minute University. It is better to cover less and have students really learn and be able to use what they have learned than to cover more and have students not remember it five years later.

Finally, Plan D requires even more of first-year law students. While most students would not label the traditional casebook method as a passive form of learning, the Plan D exercises will require students to be even actively involved in the learning process. In addition, Plan D does not get rid of the casebook method: professors will still call on students, questioning them in a way that "disrupts the equilibrium."

Conclusion

Although there are those who would disagree, it appears that Langdell, and Harvard, almost got it almost right. Langdell got in right in that students are more likely to develop adaptive expertise if, from the beginning, they engage in activities that require them to analyze data and invent their own solutions. He did, however, get it wrong in not having students engage in that analysis and invention in environments that resembled, as closely as possible, the environments in which students would be using what they learned. In addition, Langdell got it wrong when he relied solely on the casebook method. Having prepared students to learn, he should have added lectures or exercises that corrected misconceptions and made explicit the principles that he wanted students to learn. In addition, Langdell could have modeled for students how experts seek out and use various resources to solve novel problems.

Langdell can, however, be forgiven for not getting it quite right: At the time that Langdell introduced the case method, there was little or no research on the best way to teach let alone the best method for helping students develop the adaptive expertise that they will need as professionals. Although educational researchers do not have, and will probably never have, all of the answers to how to best prepare a diverse group of individuals for the practice of law, law school faculties need to demonstrate their own adaptive expertise by reviewing the research that does exist and using that research to evaluate and, when appropriate, invent new ways of teaching law.