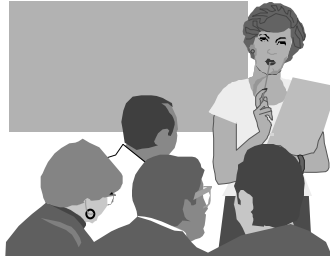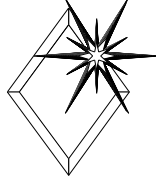# Situated Cognition & Cognitive Apprenticeships

This slide show was prepared from the following sources:

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. Educational Researcher, 18 (1), 32-41.

Collins, A., Brown, J. S., & Newman, S. E. (1990). Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics. In L. B. Resnick (Ed.), Knowing, learning, and instruction: Essays in honor of Robert Glaser (pp. 453-494). Hillsdale, NJ: Lawrence Erlbaum.

Lave, J. (1988). Cognition in practice: Mind, mathematics, and culture in everyday life. Cambridge, UK: Cambridge University Press.

Scardamalia, M., &Bereiter, C. (1985). Fostering the development of self-regulation in children's knowledge processing. In S. F. Chipman, J. W. Segal, & R. Glaser (Eds.), Thinking and learning skills: Research and open questions (pp. 563-577). Hillsdale, NJ: Lawrence Erlbaum Associates.
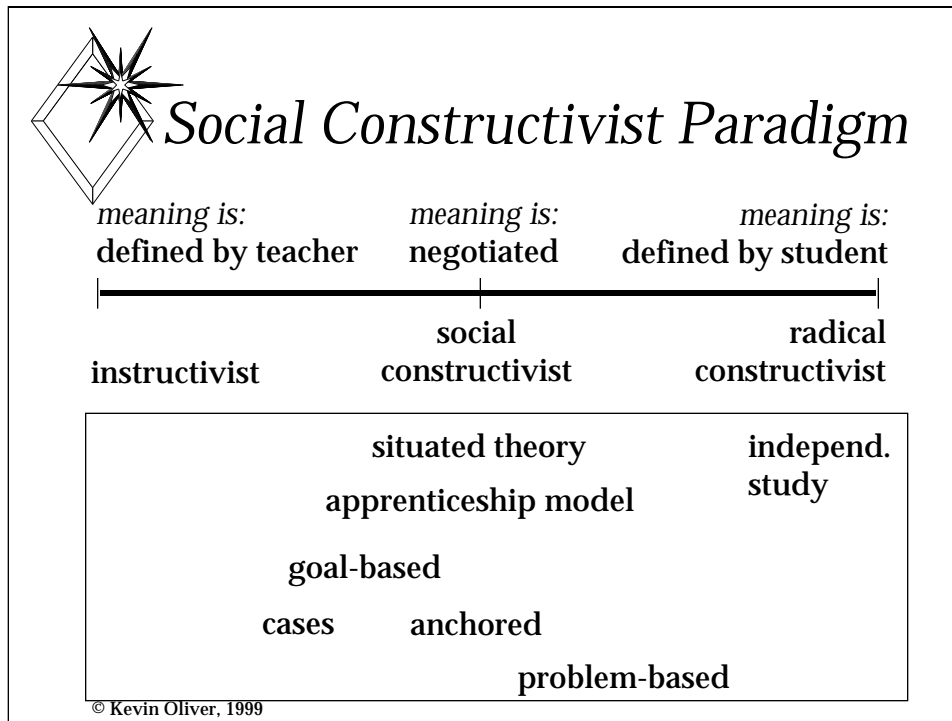
Situated Cognition & Cognitive Apprenticeships

Situated learning theory and the
cognitive apprenticeship model based
on it suggest skills be acquired through
authentic contexts and by communicating
with peers and experts about those
contexts.

Situated cognition is a theory of instruction that suggests learning is naturally tied to authentic activity, context, and culture (Brown, Collins, & Duguid, 1989). It is more difficult to learn from un-natural activities. For example, learning your first language or a foreign language by immersion is widely held to be easier than learning languages from textbooks and vocabulary lists.

Cognitive apprenticeship is a model of learning based on the situated cognition theory. It provides practical steps for applying situated cognition theory.

Social Constructivist Paradigm

meaning is: defined by teacher

meaning is: negotiated

meaning is: defined by student

instructivist

social
constructivist

radical
constructivist

situated theory

apprenticeship model

independ.
study

goal-based

cases   anchored

problem-based

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Several learning models in the social constructivist paradigm reflect some aspect of situated cognition. The cognitive apprenticeship model is most directly related to situated cognition. In situated approaches, students collaborate with one another and their instructor toward some shared understanding. Instructors who advocate such approaches believe there is a "culture" of learning that can be cultivated. In other words, students can process concepts and information more thoroughly when multiple opinions, perspectives, or beliefs must be accounted for across a group. Think of this in the context of "freedom of speech." We learn nothing new by supressing differing viewpoints and opinions, but if we allow these ideas to be expressed openly and attempt to reason for their value or lack thereof, our understanding of the concept or issue will be strengthened.
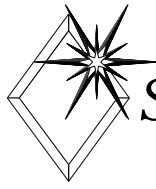
Situated Cognition *(Lave, 1988)*

- ◆ most learning occurs naturally through activities, contexts, cultures
- ◆ schools too often abstract learning, "unsituate" it, teach concepts removed from natural contexts and applications
- ◆ situated examples include more "apprentice-like" situations (e.g., sculpters, printers)

Jean Lave is often credited with starting the situated cognition movement, although its ideals are not new. John Dewey and Lev Vygotsky both advocated similar approaches.

If you are trying to think of a situated approach for your courses, think about how your skill or trade was taught before there were universities. Most likely, the skills were taught by way of apprentice-like situations. Architects learned to design by working with master architects. Physicians learned to operate by watching and assisting other physicians.

Can we create effective learning experiences for our students in this manner, or does the model break-down at some point?
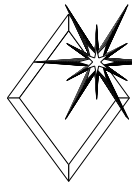
Vygotsky Advocated Apprentice-Like Coaching

- ◆ learning tasks should be situated in "zones of proximal development" just beyond what a student can accomplish alone, but not to a level of impossibility
- ◆ employ peer and teacher scaffolding to reach appropriate levels of engagement

Lev Vygotsky's concept of "zones of proximal development" suggest we design authentic tasks that are more difficult than students may handle alone, but not so difficult that they can't be resolved with the support of peers or teachers who model appropriate strategies.
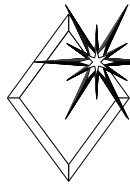
Dewey Advocated Situated Approaches

- ◆ **learning cannot be defined by outsiders (each student will learn to read by method X), but rather, emerges via collaboration (how reading supports us)**
- ◆ **cognitivists would argue learning is objectively definable, and emerges more from personal information processing**

John Dewey was an advocate of situated approaches to learning, arguing that understanding is defined within a social unit. Contrast this against cognitive pyschology which seeks to define how individuals attempt to process information. The views are not necessarily exclusive with social forces partially influencing how an individual processes information.
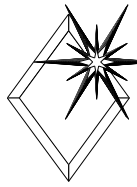
Students and Practitioners
*(Brown, Collins, & Duguid, 1989)*

people learn as both students and as practitioners

	students	practitioners
reason with:	laws	models, cases
act on:	symbols	situations
resolve:	well-defined problems	ill-defined problems
produce:	fixed meaning	negotiated and socially constructed meaning

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In today's classroom, for the most part, students are asked to reason about rules and laws pre-formulated by others, act on accepted symbols or systems, and resolve well-defined problems. This tends to produce fixed meaning which does not transfer well to new situations.

Contrast this traditional approach with the way most apprentices learn. They reason with unique models and cases, act on authentic situations, and resolve complex, ill-defined problems. This learning is typically negotiated if apprenticed. It is more effective because concepts "…continually evolve with each new occasion of use, because new situations, negotiations, and activities inevitably recast it in a new, more densely textured form" (Brown et al., 1989, p. 33).
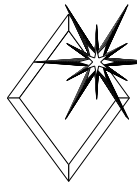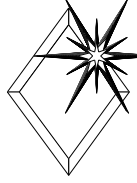
On Schooling...
Collins, Brown, & Newman (1990, p. 453)

"Only in the last century, and only in industrialized nations, has formal schooling emerged as a widespread method of educating the young. Before schools appeared, apprenticeship was the most common means of learning and was used to transmit the knowledge required for expert practice in fields from painting and sculpting to medicine and law."

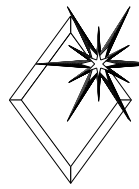# *On Schooling...*
Collins, Brown, & Newman (1990, p. 453)

"Even today, many complex and important skills, such as those required for language use and social interaction, are learned informally through apprenticeship-like methods–that is, methods not involving didactic teaching, but observation, coaching, and successive approximation."
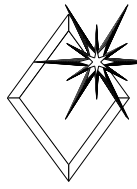
Cognitive Apprenticeship Stages

- ◆ teacher considers expert-like strategies involved in a task
- ◆ teacher designs scaffolds that encourage students to apply the strategies
- ◆ the activities should be situated or geared toward a relevant outcome
- ◆ teacher models strategies and coaches students to apply them

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The cognitive apprenticeship model consists of these stages. Teachers must consider the expert-like processes that are involved in a difficult, professional task. Authentic tasks are designed to lead students into those processes and to engage in effective strategies. The teacher initially models the requisite strategies, allows students to try them independently, and coaches students as needed.
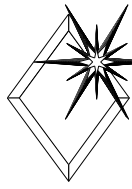
Cognitive Apprenticeship Stages

- ◆ students are required to articulate their reasoning or methods to solve a problem
- ◆ students are encouraged to reflect on and learn from others' approaches
- ◆ teacher fades supports as students apply their learning to personally relevant problems

Students should be asked to discuss and explain their problem-solving processes or strategies, and to compare their processes to those of others. As students gain expertise, the teacher fades their support and allows students to tackle personally-defined problems.
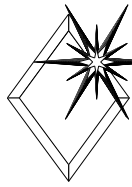
Cognitive Apprenticeship Example

- **Reciprocal Teaching** *(Palincsar & Brown, 1984)*
- teacher MODELS expert reading strategies: verbally summarize text, clarify confusing points, formulate questions, make predictions
- teacher COACHES and SCAFFOLDS students to employ strategies correctly as they take turns applying them
- the teacher's prompting FADES as students become proficient in reading comprehension

Palincsar and Brown's reciprocal teaching strategy follows elements of the cognitive apprenticeship model. Teachers model expert reading strategies, coach students as they attempt to employ them, then fade their support. Students critique and reflect on one another's summaries.

Cognitive Apprenticeship Example

◆ **Writing** *(Scardamalia & Bereiter, 1985)*

◆ **teacher listed expert strategies for writing, related to planning**

◆ **teacher MODELS planning process, uses cue cards as SCAFFOLDS to prompt students to plan rather than jump into writing**

Scardamalia and Bereiter developed a strategy to help students plan their writing. Expert planning processes were modeled by the use of cue cards to help students develop new ideas, improve ideas, elaborate on ideas, and collapse ideas.

As an aside, the CSILE project of Scardamalia and Bereiter also encompasses some situated cognition principles, involving students in collaborative writing efforts. It is a good example of a system architecture that might support this types of learning.

The most thorough framework for designing situated learning environments is provided by Collins et al. (1990).