Cognitive Apprenticeship

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Features of Apprenticeship

- Apprenticeship is the way we learned before schooling
- Unlike school, apprenticeship embeds learning in the social and functional contexts of its use
- Lave emphasizes observation, coaching, and practice or in our terms modeling , coaching, scaffolding, and fading
- Essence of apprenticeship method is to start out providing a highly structured environment and slowly turning over control to the learner
- Master knows learner well reducing failure
- Technology makes it possible to realize apprenticeship method much more widely

Differences between Cognitive and Traditional Apprenticeship

- **Tasks chosen to reflect the changing demands of learning rather than what comes in the door**
- **Learning set in diverse contexts to foster generalization rather than constrained to a particular work setting**
- **Making thinking visible rather than relying on observation of physical skills**

Framework for Designing Cognitive Apprenticeship Environments (1)

Content: types of knowledge required for expertise

- **Domain knowledge:** subject matter specific concepts, facts, and procedures
- **Heuristic strategies:** generally applicable techniques for accomplishing tasks
- **Control strategies:** general approaches for directing one's solution process
- **Learning strategies:** knowledge about how to learn new concepts, facts, and procedures

Framework for Designing Cognitive Apprenticeship Environments (2)

Method: ways to promote the development of expertise

- **Modeling:** teacher performs a task so students can observe
- **Coaching:** teacher observes and facilitates while students perform a task
- **Scaffolding:** teacher provides supports to help the student perform a task
- **Articulation:** teacher encourages students to verbalize their knowledge and thinking
- **Reflection:** teacher enables students to compare their performance with others
- **Exploration:** teacher invites students to pose and solve their own problems

Framework for Designing Cognitive Apprenticeship Environments (3)

Sequence: keys to ordering learning activities

- **Increasing complexity:** meaningful tasks gradually increasing in difficulty
- **Increasing diversity:** practice in a variety of situations to emphasize broad application
- **Global before local skills:** focus on conceptualizing the whole task before executing the parts

Framework for Designing Cognitive Apprenticeship Environments (4)

Sociology: social characteristics of learning environments

- **Situated learning:** students learn in the context of working on realistic tasks
- **Community of practice:** communication about different ways to accomplish meaningful tasks
- **Intrinsic motivation:** students set personal goals to seek skills and solutions
- **Cooperation:** students work together to accomplish their goals

Benefits of Situated Learning

- **Learners understand the uses and purpose of what they are learning**
- **They learn while actively using knowledge rather than passively receiving knowledge**
- **They learn the different conditions where the knowledge can be applied**
- **Learning in multiple contexts fosters generalization**

Metaphor to Learning Tennis

- **School is like having learners practice hitting serves, backhands and forehands, and volleys without playing games or even watching games**
- **A tennis coach will teach these skills but *interweave* this practice with playing games**
- **The coach will determine what skills you need to work on, provide hints as to strategies to apply, and find challenging opponents to play against**

Model for Cognitive Apprenticeship in a Project-based Curriculum

- **Novice:** Students come in as novices and work on a project of their own with one of the more experienced students mentoring them, as they carry out the project.
- **Apprentice:** As they gain experience, they work on larger projects with other students, where more advanced students serve as project and subproject leaders.
- **Mentor:** After they have worked on a number of different projects, they are ready to serve as a mentor for a new incoming student.
- **Project leader:** After they have done their mentoring successfully, they are ready to begin serving as a project or subproject leader on larger projects.

Benefits of Technology for Creating Apprenticeship Learning Environments

- **Situated learning**
- **Modeling**
- **Coaching**
- **Scaffolding**
- **Articulation**
- **Reflection**
- **Intrinsic motivation**