Chapter 8

Learning in Context

- Learning
  - process and problems
- Expertise
  - levels and development
- Psychology of programming
- Learning context
  - collaborative and situated
Learning as an active process

• Learning through analogy
  – using familiar situations
  – word processor versus typewriter
• Ad hoc reasoning
  – explanations for unexpected events
• Learning from errors
  – inhibitors such as evaluation fears

Learning difficulties

• Learning is difficult
  – learners may blame themselves
• Learners lack basic knowledge
  – do not understand computer jargon
• Learners make ad hoc interpretations
  – learners construct interpretations
• Learners generalize from what they know
  – assume familiarity, consistency
Learning difficulties (cont.)

• Learners have trouble following directions
  – do not always read, follow, or understand
• Problems interact
  – one problem can create another
• Interface features may not be obvious
  – may be confused by messages and outcome
• Help facilities do not always help
  – do not know what to look for

Two types of errors

• Mistakes
  – incorrect action based on incorrect decision
• Slips
  – unintentional error, like accidents
  – most frequent errors
Types of Slips

- Capture error
- Description error
- Data-driven error
- Associative-activation error
- Loss-of activation error
- Mode error

Expertise

- Novice versus expert
  - differences in the way knowledge about a skill is structured in long term memory
    - expert chess player stores 50,000 to 100,000 board positions in chunks
    - novices have only a few positions and no sequences
Declarative and procedural knowledge

- Declarative knowledge
  - facts about the world
  - describing what
- Procedural knowledge
  - how things are carried out
  - describing how

Types of programming knowledge

- Syntactic
  - language units and rules for combining them
- Semantic
  - mental model of locations, objects, actions
- Schematic
  - categories of routines based on function
- Strategic
  - techniques for devising and monitoring plans
Collaborative and Situated Learning

• Collaborative learning
  – encourages social interaction and discussion

• Situated learning
  – apprenticeship, limited doing
  – legitimate participation
  – social situation is important