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