Best Practices for On-line Delivery

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Outline

- A brief overview of CS5744: Software Design & Quality
- Course design comes first:
  - Learning goals
  - Activities and assignments
  - Choosing communication support
  - Keeping students involved
  - Your audience's habits
  - Your first week's assignment
  - Develop a rigid weekly schedule
  - Writing for the web

What is this course?

- Designed CS 5744: Software Design & Quality in 1999
- Now fully matured, went international in 2004
- 100% on-line course:
  - Paperless, all electronic
  - No face-to-face meetings
  - Weekly Centra meetings (synchronous)
  - Discussion-based class with some group projects

CS 5744: Software Design & Quality

- Graduate MIT course with software engineering prerequisite
- Teaches:
  - Advanced software design
  - Critiquing/analyzing designs
  - Quality assessment
  - Practices that improve quality
  - Learn by doing, “over the shoulder”, through analysis/reflection, and via group projects

5744 Learning Activities

- Weekly reading assignments with questions to turn in
- Participation for grade
- Four writing intensive assignments
  - Two individual
  - Two small group
  - Centered on a high-level group design created for one project, analyzed and built on for others

Formative Evaluation

- Students surveyed twice using Flashlight inventory
- Students rated this course higher than others they have taken for:
  - Discussing topics with other students
  - Applying info outside of class
  - Enjoying studying
  - Better able to communicate/understand
- 100% satisfied or very satisfied
Student Impressions

- "This is one of the best classes I have ever had."
- "From all the readings, homework assignments, and group projects, I have been much better equipped with relevant knowledge and experience."
- "It didn't always feel like we were watching the class, rather for the most part I felt involved in the lectures."
- "The drop-box feature, the way information and announcements were posted were all excellent. He definitely took a lot of time in making this web-form of communication efficient."

Student Negatives

- Communication was not as easy or effective: with students at other sites, with professor, and during class
- Textbook desirable
- Non-native English speakers

Issues for Asynchronous/On-Line Delivery

- Some learning activities require:
  - Fluid, effortless communication
  - Face-to-face interaction
  - Simultaneous presence
  - Even when delivery can be on-line, the nature of grading/managing the course can still limit capacity (for 5744, 30-50 students max)

Its All About Course Design

- Course design comes before web design
- Overall pedagogical design is the most influential factor, next to the instructor
- Back to the basics:
  - Learning goals
  - Student activities and assignments
  - What communication/interaction is needed?
  - Keeping students involved

Course Learning Goals

- First, write down a clear, complete set of learning objectives
- For your own use
- It is important to let these goals drive your later choices:
  - Activities and assignments
  - On-line communications mechanisms
  - Web site features

Example From SD&Q: Learning Goals

- Students should be able to:
  - Analyze a software design:
    - Identify strengths and weaknesses
    - Critique the design
  - Compare and contrast quality assessment techniques
  - Apply at least one quality assessment technique:
    - Develop a test plan
Student Activities & Assignments

- Ask yourself: What do students need to do to learn this material?
- Think about translating learning goals into specific activities or assignments (not all need be for credit)
- Besides homework or reading:
  - Writing, individual projects, group projects, presentations, discussions, Q&A, debates ...
- Grade assessment will naturally follow

Example From SD&Q: Activities

- Weekly discussions similar to a literature class
- Two written critiques of designs by others
- One small group design project:
  - Visible to all on web
  - Includes reflection/self-assessment activities
- One small group test planning project:
  - Based on work of others
  - Includes reflection/self-assessment activities

Choosing Communications Tools

- Examine the activities you are planning
- What interactions/communication are most needed to carry out these activities?
  - Student ↔ instructor
  - Peer ↔ peer
  - Student ↔ material
  - Pick tools that support your activities

Example From SD&Q: Communication

- Almost exclusively:
  - Web site
  - Centra
  - E-mail
  - Digital drop box
  - Group support tools from Blackboard

Keeping Students Involved

- What makes the on-line experience worthwhile for them?
- What brings them back to the site regularly?
- What keeps them engaged in activities?
- The activities you set up for your class can make a huge difference

Example From SD&Q: Involvement

- Student investment and ownership: students were able to choose the subject of 3 out of 4 major assignments
- Student submissions for major assignments were placed (anonymously) on the web site for others to view
- Students had to work with and critique the work of their peers
- Weekly discussions involved everyone
The First Week

- Plan to devote Week 1 to getting students settled on-line
- Start off with an assignment due during the first week:
  - Read syllabus, get text book(s)
  - Download/install proper software
  - Get headset mike (if using Centra)
  - Attend a "test" meeting to work out kinks

A Strict (Weekly) Schedule

- Devise and stick to a rigid weekly schedule that dictates when:
  - New assignments are posted
  - Weekly meetings are held (if any)
  - Assignments are due
  - On-line office hours are held (if used)
  - Instructor responds to discussion boards
- This establishes a habit, and keeps students coming back to the web site regularly

Writing for the Web

- People rarely read Web pages word by word
- Instead, they scan the page
- Want the facts, and to find them as easy as possible
- Meaningful subheadings, inverted pyramid, reduced word count, ...
- See Nielsen's many excellent tips at http://www.useit.com/papers/

Lessons Learned from Comparing On-line Courses Across Disciplines

- Common themes
  - Creating a community of learners
  - Supporting asynchronous communication
  - Holding synchronous meetings
  - Providing social support
- Breaking stereotypes
  - Techno-phobia, communication barriers, computer access, preferred tools