Developing and Evaluating Paper-based and Onscreen Instructional Material for a Distance-based Introductory Financial Accounting Course

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The University focuses on access and flexibility

- Anytime, anywhere
- Over 500 university courses
- No need to forego full- or part-time employment, relocate
- More than 23,000 students
School of Business

- Over 13,000 annual registrations in undergraduate business courses during 2002
- 10% per year compounded growth over last five years
Study Options

Individualized study in a Web-based environment

- 6 months to complete
- E-mail and telephone assistance
- Combination of electronic study guides and paper-based textbooks
- Video streaming, simulations
- Online library services
- Online assignments, exams
Study Options – con’t

eClass® study in a Web-based environment

- 15 week, paced online courses
- Instructor-guided, mostly online instructional material
- More interactive components, like group-based activities and assignments, and discussion groups
- September and January start dates
Accounting 253
Introductory Financial Accounting

- Over 1,000 annual registrations
- Paper based textbook, Student Manual, Solutions Manual
- 10 lessons; 4 assignments
- 2 invigilated exams (60%)
Textbook Conversion

- Copyright reverted to author (Dauderis)
- Optically scanned, proofread
- Graphics redone
- Third edition changes made
- About 4 year process
- About $80,000 Cdn. to produce
Economics of Conversion ($Cdn)

- Cost to purchase: $75
- Variable production costs: (35)
- Savings per text: $40
- Fixed conversion costs: $80,000
- Breakeven ($80,000/$40): 2,000 texts (2 years)
Process of Conversion

- Electronic reproduction rights
- Digitized files of high-quality textbook
- Text, study guide, assignment and solution manuals converted to .pdf using Acrobat Distiller
- Unused copyrighted material deleted
Process of Conversion (cont.)

- Notes, solutions placed in context
- Existing computer-based modules integrated
- Web sites, roll-over definition boxes added
- Course outline, navigation features added
- Assignment submission automated
Process of Conversion (cont.)

- Free Acrobat Reader, installer, movie player software included on CDROM
  - Search for terms, adjustable print size
  - Cut/paste capability
  - Security features (not used)
- On-demand download when bandwidth permits (200 Mb)
Formative Evaluation

17 classroom students, September to December 2000

Purchase for about $75 or use free CD-ROM

- 5 used only the paper-based textbook
- 5 used only the CD-ROM
- 7 switched to paper-based materials
Pros

- Ease of access to solutions, CBI modules
- No navigation or installation problems were reported by any CD-ROM users
- Digital material not difficult to decipher
Cons

- More computer time needed
- Reading from screen tiring
- Unable to print out material, make notes (enabled in next iteration)
- Correlation between choice of medium and student performance could not be established because of small sample size
Current Research

Media studies often confounded by differences in instructional design, failure to consider incremental costs (Clark 1983, 1994)

- Instructional design virtually identical
- $7,000 in-kind learning/conversion costs
- $(35 + 10) - $12 = $33 per CDROM
- Break-even = 210 CDROM users
Current Research (cont.)

Further study undertaken September, 2000

- 400 AU student volunteers, randomly assigned to print or CDROM versions
- Pre- and post-tests to assess differential student learning
- Post-completion questionnaire to assess qualitative factors
Results to Date

- 10% participation (94 to date)
  - Historically, 50% non-completers in all modes
  - On-line group can't keep their paper based materials
  - 20% of CDROM users have withdrawn due to inconvenience of working on-line
- Learning outcomes inconclusive
- Timeline extended
Conclusions

- Quantifying differential learning effects is difficult, but at some point an analysis must be attempted and the least costly alternative selected (Clark, 1994)
- Major comparative media concerns addressed
Future Considerations

- Material to be reduced in both versions
- Equality of access, quality of overall interaction, revision cycles, future institutional goals (Bates, 1995)
Questions for You

- What if learning outcomes are the same, CDROM affective factors are inferior, but costs reduced for institution?
- Student numbers may decrease, but what if savings are passed on to students?
Questions For Me

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