

# **Experiences with International Web-based Introductory Long-Distance Statistics Courses**

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# Introduction

- Stat 2000: Introduction to Statistical Methods
- Utah State long-distance course
- 3 sessions offered 2004 in Hong Kong
  - Spring (15 weeks, 01/12-04/19): 60 students
  - Summer 1 (12 weeks, 02/23-05/10): 30 students
  - Summer 2 (15 weeks, 04/26-08/02): 89 students

## US Setup: Course Structure

- Use of electronic textbook CyberStats (first use outside North America)
- ~2 CyberStats subunits assigned per week
- 1 main instructor in US
- 1 local instructor in Hong Kong
- Students have to work fully electronically:
  - No printed textbook required (but optionally available)
  - Web-based homework submission and grading
  - Web-based exams and grading
  - Communication via message board & e-mails

## Course Map

Units A - Collecting and Visualizing Data

Units B - Modeling Random Behavior

Units C - Inference

Units D - Regression

Units E - Design of Experiments and ANOVA

Units F - Time Series

Units G - Statistical Process Control

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## US Setup: Electronic Exams

- Web-based exams:
  - 3 in Spring
  - 2 in Summer 1 & 2
- Exams taken in Hong Kong classroom
- Multiple-choice questions and text-based questions to be answered via CyberStats password-protected html Web page
- Question order randomized for each student, but identical questions within each group

## US Setup: Electronic Grading

- Grading via html Web page with forms for points and instructor comments
- ALL answers (including duplicated ones) for a questions for ALL students visible at the same time
- Future research question: in which way do students change their answers?

# US Setup: Problems & Solutions (1)

- 7 students involved in cheating in final exam in Spring (awarded F), e.g., Question 39:
  - 1244x: [ServerTime Apr-21-2004 10:46:52 PM]  
there has three outliers , and the data is fairly symmetric
  - 1257x: [ServerTime Apr-21-2004 10:54:14 PM]  
there are no outliers. The boxplot shows that there is fairly symmetric.
  - 1257x: [ServerTime Apr-21-2004 11:18:37 PM]  
there has three outliers , and the data is fairly symmetric
- Solution: Additional proctors in back of the classroom

## US Setup: Problems & Solutions (2)

- Almost impossible to motivate students to participate in discussion via message board; too shy or language problems ?
- Solution: none so far

# Hong Kong Setup: Weekly Meetings (1)

- Weekly meetings of 180 minutes, mostly in computer lab
  - 10 min computer setup
  - 75 min lecture period
  - 5 min break
  - 75 min lecture period
  - 15 min Q & A period
- In lecture period: discussion of course material & work with WebStat & other interactive tools
- In Q & A period: Homework questions and further work with interactive tools

## Hong Kong Setup: Weekly Meetings (2)

- Attendance above 90% at start of the semester
- Attendance gradually decreased to about 70%
- Exception: Close to 100% before exams  
(discussion of sample exams)

# Hong Kong Setup: Electronic Homework Submission & Grading

- Almost 100% of homeworks submitted electronically
- About 60% to 70% of homeworks submitted on time
- Grading of homeworks:
  - “In my opinion, it’s really convenient to grade the homework online in CyberStats.” (Alex, Local Hong Kong Instructor)

# Hong Kong Setup: Problems & Solutions

- Some technical problems with CyberStats
- Sometimes slow to access CyberStats
- Sitemap would be helpful
- Solutions: Communication with CyberStats developers; possibly CyberStats mirror site?

# Student Survey (1)

- After the final exam
- No extra credit in Spring: 5 / 58 responses from students attending the final exam
- 20 points (towards 1000 points score) in Summer 1 & 2: 27 / 27 and 60 / 81 responses (59 / 69 from students eventually passing the course)
- 25 (Spring) and 23 (Summer 1 & 2) questions on:
  - General
  - Instruction
  - CyberStats
  - Exams
  - Demographics/Personal
- Non-anonymous responses, due to CyberStats; any answer (including “NA”) was acceptable

## Student Survey (2)

- Results for Summer 2 session only (60 responses):
  - Demographics: about 50% male & 50% female; mostly early 20ies; English as a secondary language
  - For most students, this was their first statistics course
  - Students generally satisfied with overall quality of the course and instruction
  - 19 students found this course better than other distance learning courses they took before
  - Some students complained about computer shortage and fast pace of local instructor

## Student Survey (3)

- Results for Summer 2 session only (continued):
  - 27 students found CyberStats terrible, or were not very happy about it; 17 students liked it
  - Favorite CyberStats feature: WebStat and possibility to analyze data directly; not so popular: message board and e-notes
  - Time and difficulty level of exams appropriate for most students
  - Favorite exam questions: multiple-choice; least-favorite: text-based questions, with or without interactive tools

## Conclusions

- Overall positive experience for US Instructor
- “Convenient, user-friendly, excellent aid from calculators and WebStat during the class.” (Alex, Local Hong Kong Instructor)
- We continue to use CyberStats for upcoming Intro Stats course in Hong Kong this Fall semester !

## Future Work

- Do a full analysis of all surveys
- Link survey answers to overall student performance
- Further analysis of repeated / changed student exam answers

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**Questions ?**