Student Perceptions of Online Multimedia Instruction with JiTT

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The Course: APSC 160

- Introduction to computing required in all Engineering programs.
- Term 1: ~ 470 students in two sections
- Term 2: ~ 360 students in two sections
- First 8 weeks taught by Computer Science department, remaining 5 by Electrical & Computer Engineering department.
- This study conducted in first 8 weeks of course.

The Traditional JiTT Model

- Students read assigned sections of text and take online quiz related to reading material *before* coming to class.
- Instructor reviews responses to online quiz and selects in-class materials that focus on student misconceptions.
- During lecture students work on concept questions and a "just-in-time" lecture is delivered to address misconceptions.

The Modified JiTT Model

- Pre-class textbook reading is augmented with online multimedia screencasts (Voice-Over-PowerPoint).

- Screencasts are between 2 and 15 mins duration (average approximately 7 mins) and present students with the fundamentals.

- A total of 29 screencasts were developed.

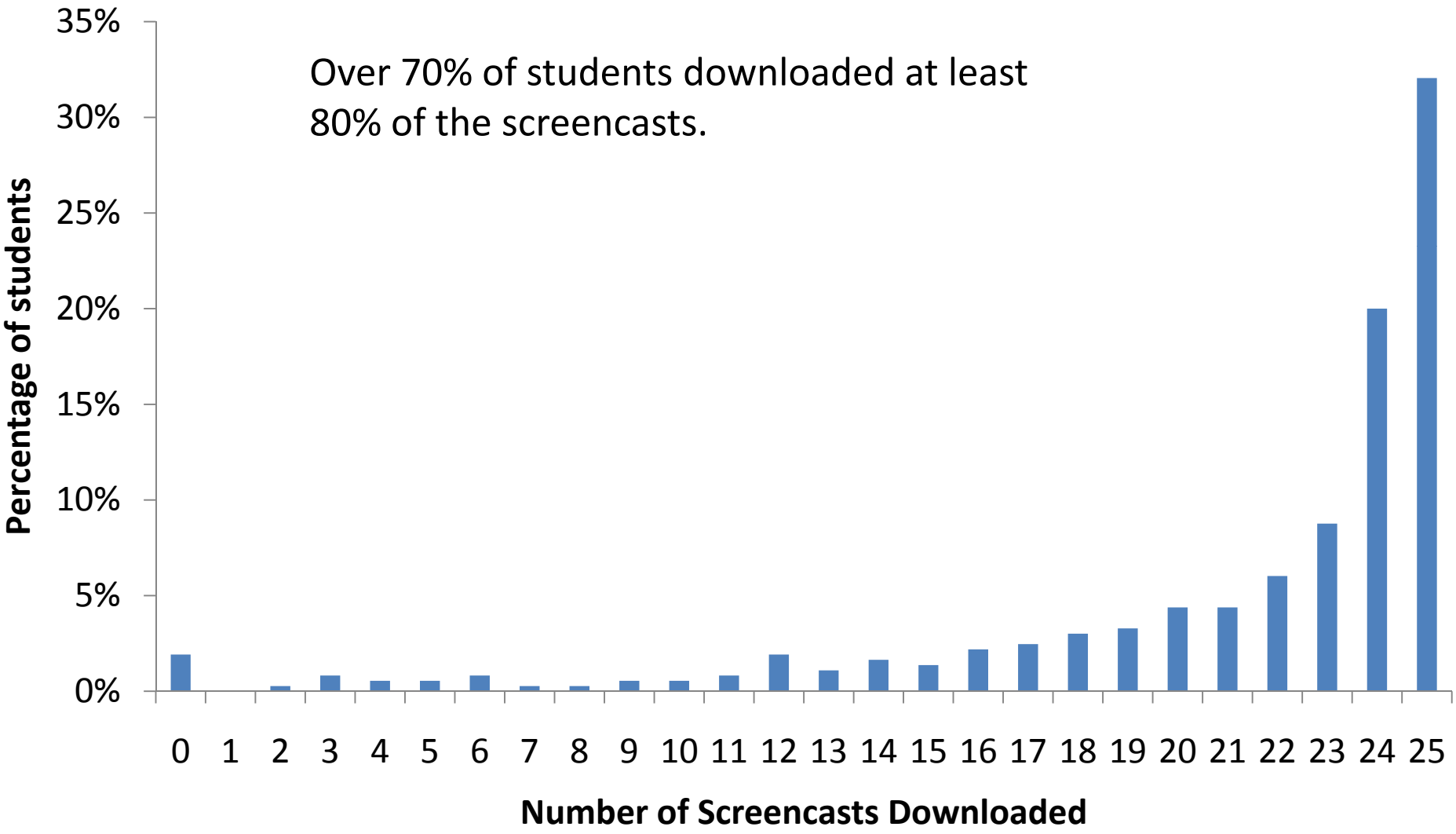
The Modified JiTT Model

- Classes start with a series of clicker questions to assess student comprehension of fundamentals presented in screencasts (10-15 mins)

- Students then work in small groups on worksheets that gradually expose them to more difficult problems.

- Time spent working on problems is interspersed with instructor-led discussion of solutions.

Student Engagement - Screencasts



Student Engagement - Attendance

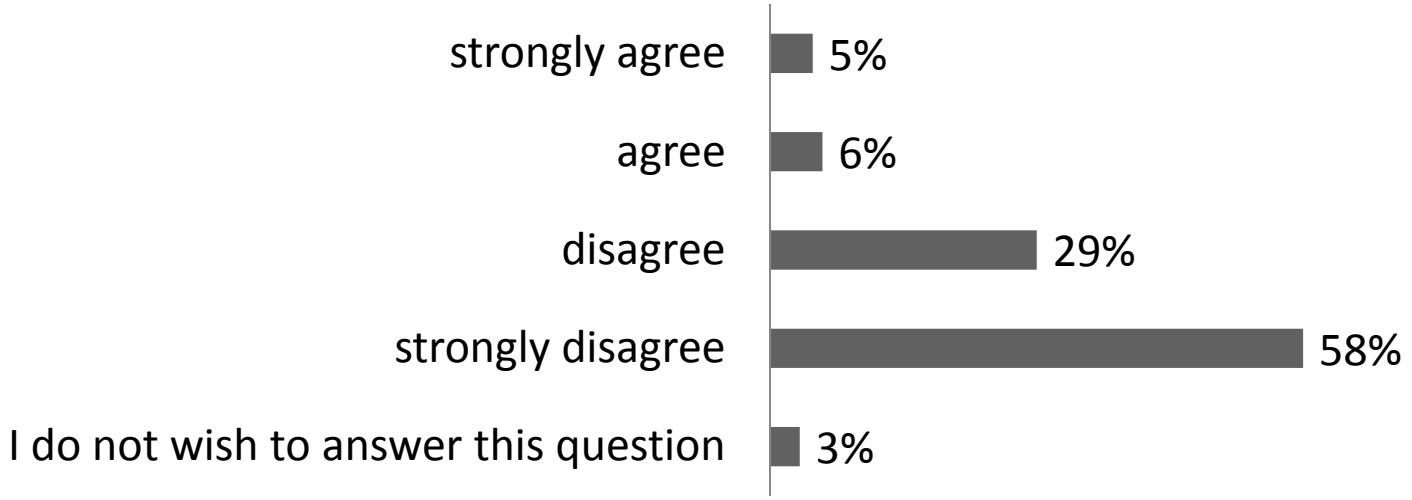
- Term 1 attendance:
  - average 91% response rate to clicker questions (clicker questions worth 5% of overall grade)
  - lowest response rate: 81% (day after midterm exam)
- Term 2 attendance:
  - average 82% response rate to clicker questions (clicker questions worth 3% of overall grade)
  - lowest response rate: 56% (afternoon of Winter Olympics Opening Ceremonies)

Survey (End of week 8)

- Approximately 80% of students responded.
- Over 70% of students who failed the midterm exam responded.
- Survey was conducted *after* midterm grades had been released to students.

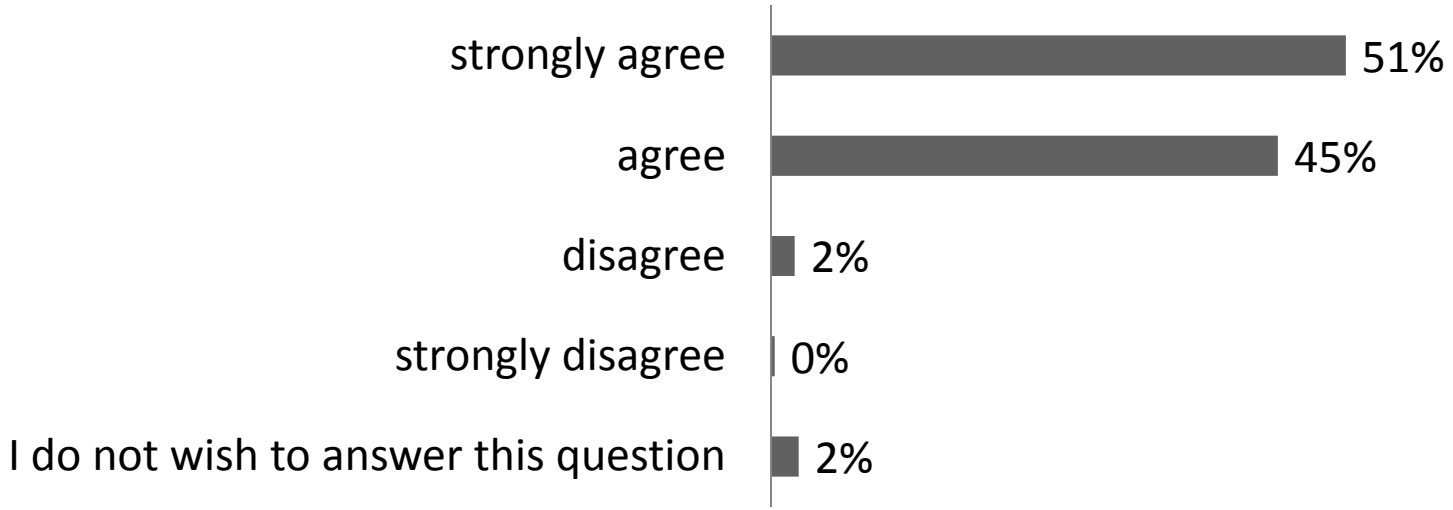
Survey – Course Format

- I would prefer that this course be taught using a traditional lecture format rather than having online screencasts and in-class problem sets.



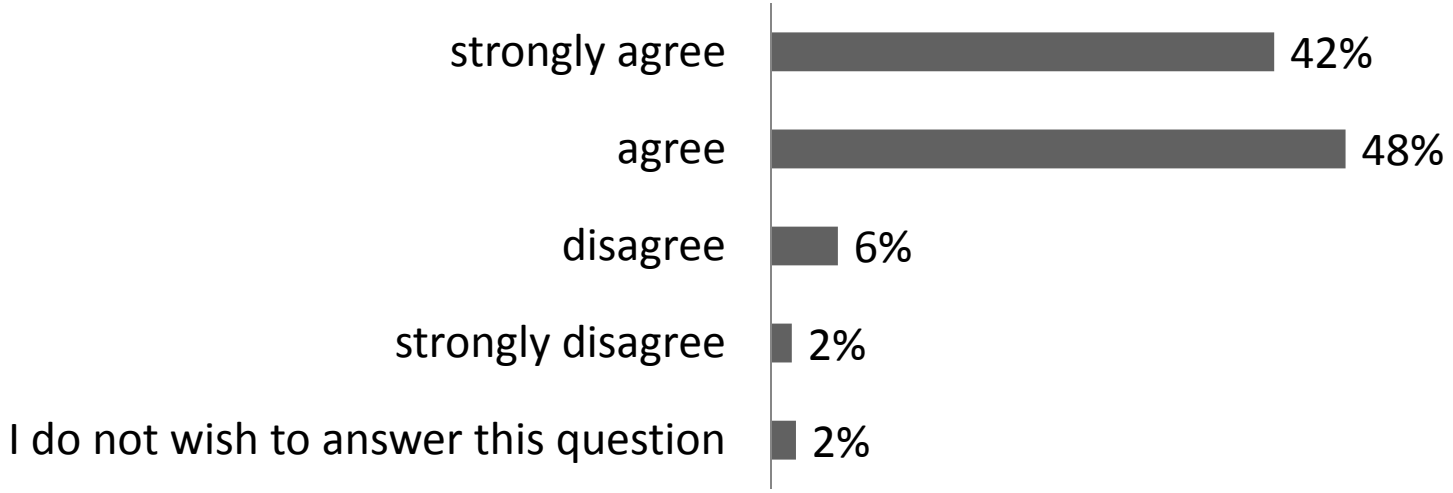
Survey - Screencasts

- The online screencasts help me learn basic concepts on my own.

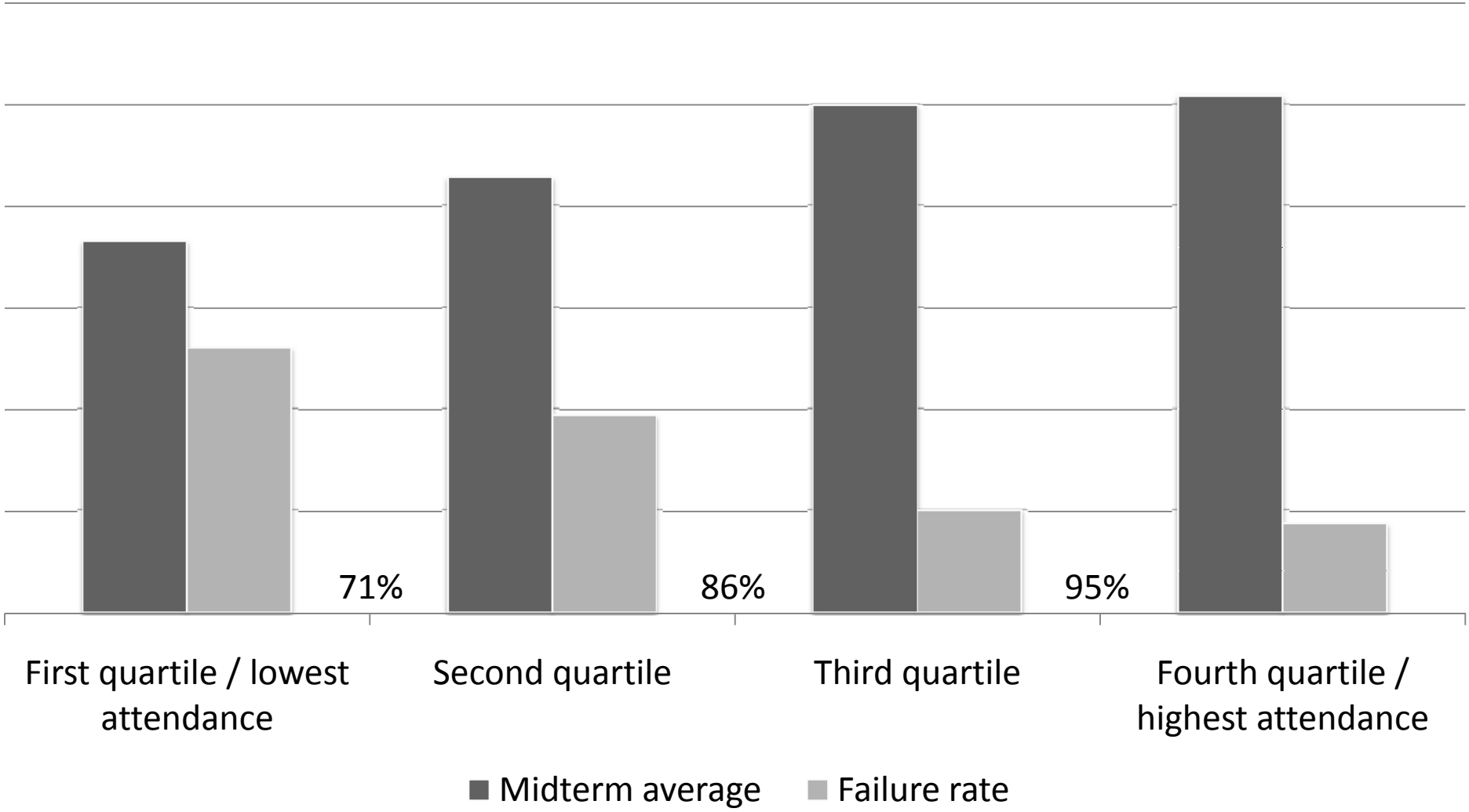


Survey – In-class problems

- The in-class problem sets help me gain a deeper understanding of the concepts presented in the screencasts.



Attendance* vs. Midterm Performance



* - as measured by clicker participation mark

Student Reaction – Selected Quotes

- "I find watching the screencasts before the lectures and applying the information during lecture time helps me to pinpoint what information I understand and what I do not more effectively than a usual lecture format."

- "I can review the screencasts many times if I do not understand."

Student Reaction – Selected Quotes

- "Most classes teach the basics in class and make you figure out advanced problems on your own. This method lets you figure out the easy stuff and then helps you with the harder problems."

- "I didn't have to study for the midterm because I ended up already knowing how to do things."

Student Reaction – Selected Quotes

- "They [screencasts] are helpful for keeping up with the class and for easy revision. However, one does not get the chance to ask questions in real-time unlike with traditional lectures."

- "It's better to take notes in lectures."

- "It [traditional lecture] is more common and we are used to it."

Future Work

- Why was there a lower attendance rate in term 2? Did the change from 5% to 3% for the weight on clicker questions make a difference?
- Assess long-term retention of learning using pre-tests at start of follow-on course.
- How polished do the screencasts have to be for students to find them effective?