

Abstract

Reflective thoughts and preliminary data are shown on the use of oral exams in an undergraduate core engineering class, AE 325 (Aerodynamics).

Why Orals?

- For a more comprehensive assessment of student performance
- Written exams primarily test problem-solving skills
- Ability to solve problems does not always translate to an understanding of the underlying principles
- Oral exams can *supplement* written assessments

Challenges

- Instructor time required
 - Not practical for very large classes
 - Factor of ~2 compared to grading written exams
- Exam fairness and enforcing the honor code
 - Cannot prevent students from talking
 - Changing questions compromises fairness
 - There is a learning curve to asking the questions
- Grading
 - No two oral exams are the same
 - Assigning grades bears a degree of subjectivity

Benefits

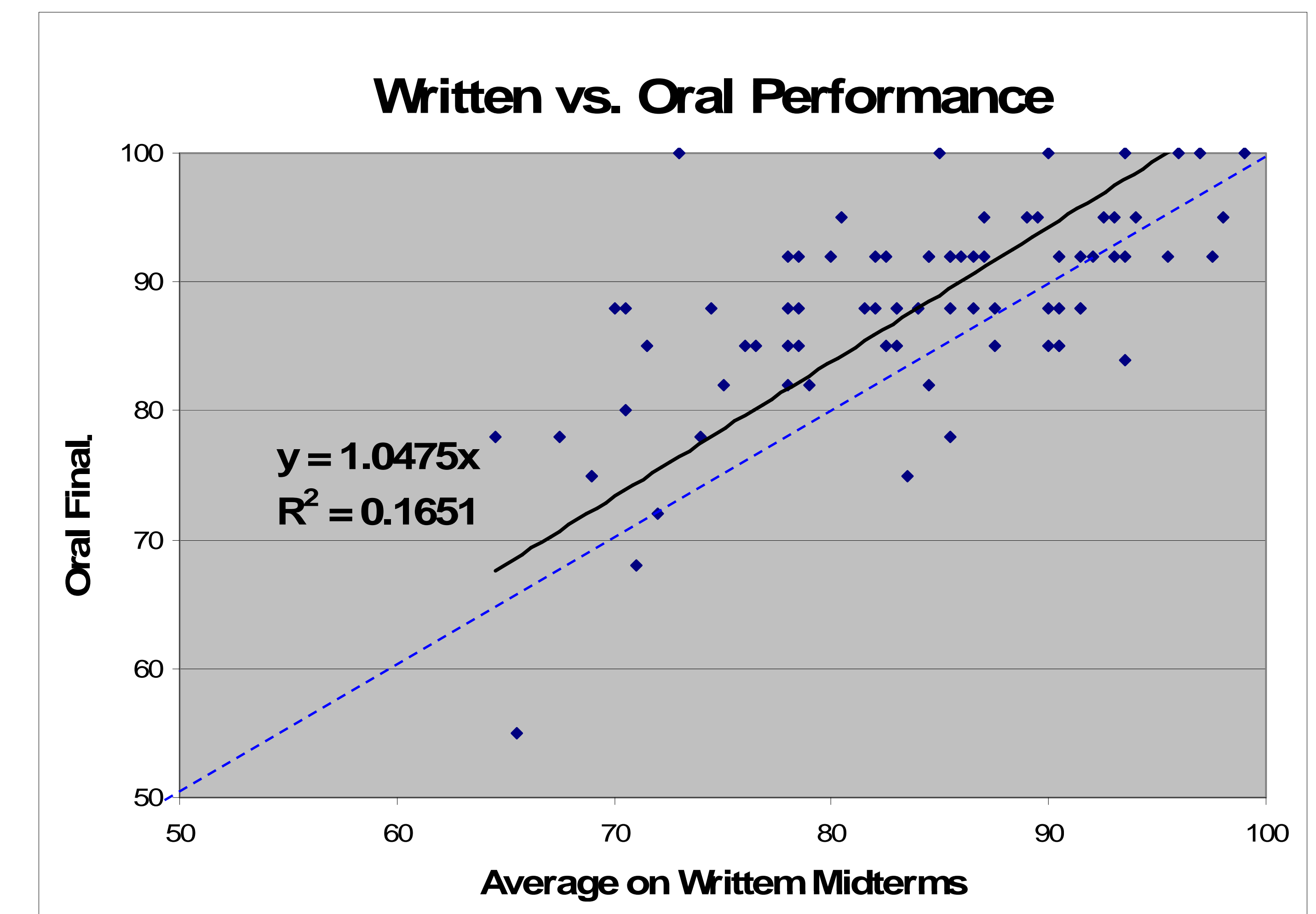
- A more comprehensive assessment
- A more flexible testing environment
 - Students' "stupid mistakes" easily avoided
 - Examiner can delve into topics as deemed necessary for an accurate assessment in real time
- The test reinforces communication skills

Effect on Lectures

- Lectures should emphasize fundamental concepts in addition to problem solving skills
 - Do not want to stress already packed curricula
 - Many problem-solving skills are best learned through homework assignments
 - "Look-ahead" assignments can free up lecture time and better prepare students for lecture material.
- Concept questions
 - Introduce an active learning element into lectures
 - Real-time performance feedback to instructor
 - Possible with today's technology (e.g. Qwizdom)
 - Implementing more heavily in current semester

Case Example

- Aerodynamics 325, Winter 2009
- 82 students, Junior and Senior level
- Exams:
 - Two written midterms (15% each)
 - One oral final (20%)
- Oral exam format:
 - Two questions per exam
 - Swapped out one question each day (3 days)
 - Students have 20 minutes with questions before the exam in a preparation room
 - 20 minutes with instructor for the oral
 - Each oral was tape recorded
 - Made notes during exam and assigned points using a concept-based rubric
 - Graded by letters, using: A = excellent, B = good, etc. Then converted to points.
- Data and feedback:
 - Comparison of written versus oral performance
 - Student evaluation comments



Spread suggests that problem-solving ability does not necessarily correlate with a conceptual understanding.

Student comments:

- "I was rather skeptical of the oral final at first, especially since I didn't know exactly how it would be planned ... The way you handled the oral exam definitely made the experience less frightening and painful than a typical written exam"
- "The final oral exam was really cool. I would definitely continue with this..."
- "I was a bit wary of it at first (like most people were) since I had never done something like that. But it was fine and I think it really showed if we grasped the concepts."

Aside from apprehension, no negative feedback on the use of orals

Future Plans

- Continue oral exams in AE 325
- Assess the effectiveness of oral exams through
 - Student performance statistics
 - Course evaluations
- Refine the oral grading rubric

Acknowledgements

Cynthia Finelli of CRLT North for valuable midterm student feedback evaluations