

# Work In Progress – Student Learning as a Function of Attendance in Large Engineering Classes

Michael Elmore

Engineering Design Division

Koenraad Gieskes

Engineering Design Division

**BINGHAMTON**  
UNIVERSITY  
STATE UNIVERSITY OF NEW YORK

Thomas J. Watson  
School of Engineering  
and Applied Science

- **Introduction**
- **Freshman Program**
- **Course Attendance Learning Study**
- **Results**
- **Conclusion**

- **Introduction**
- Freshman Program
- Course Attendance Learning Study
- Results
- Conclusion

# ***INTRODUCTION***

**ENGINEERING DESIGN DIVISION  
BINGHAMTON UNIVERSITY**

- Felder [Ref. 1] has discussed the dependency of student learning and engagement in large engineering classes on individual learning styles.
- Many classes require attendance at lectures, even if some students are not engaged.
  - This is specially true for freshman to help them transition from high school to college.
- The consequences of not attending has been extensively studies [Ref. 2 – 5]

- This study documents an alternative for freshmen engineering students to attending a large lecture.
  - Students are required to either attend the lecture or view a video recording of the lecture.
- The study aims to determine if there is any disadvantage for student learning, if they view the video recording rather than attend the lecture.

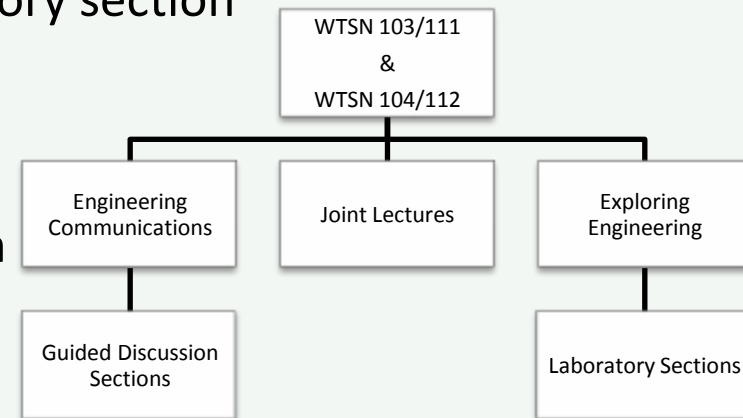
- Introduction
- **Freshman Program**
- Course Attendance Learning Study
- Results
- Conclusion

# ***FRESHMAN PROGRAM***

**ENGINEERING DESIGN DIVISION  
BINGHAMTON UNIVERSITY**

- Common first year for all freshman students. Each semester the students take the following courses:
  - An Introduction to Engineering course
    - Fall: WTSN 111 - Exploring Engineering I
    - Spring: WTSN 112 - Exploring Engineering II
  - A Technical Communications course
    - Fall: WTSN 103 – Engineering Communications I
    - Spring: WTSN 104 – Engineering Communications II
  - A Calculus course
  - A Science course
  - A General Education Requirement course

- WTSN 103/104 & 111/112 are linked
  - Joint **one hour lecture** section that meets **twice a week**
    - ~300 Students
  - Separate activity/discussion sections
    - WTSN 111/112
      - One and a half hour laboratory section
      - ~25 Students/section
    - WTSN 103/104
      - Two hour discussion section
      - ~35 Students/section





- Introduction
- Freshman Program
- **Course Attendance Learning Study**
- Results
- Conclusion

# ***COURSE ATTENDANCE LEARNING STUDY***

**ENGINEERING DESIGN DIVISION  
BINGHAMTON UNIVERSITY**

- In the fall 2010 semester attendance was taken in lecture with an *iClicker*<sup>TM</sup>.
- Attendance in lecture was required of all students.
  - The final grade was lowered, if the attendance requirement was not met.

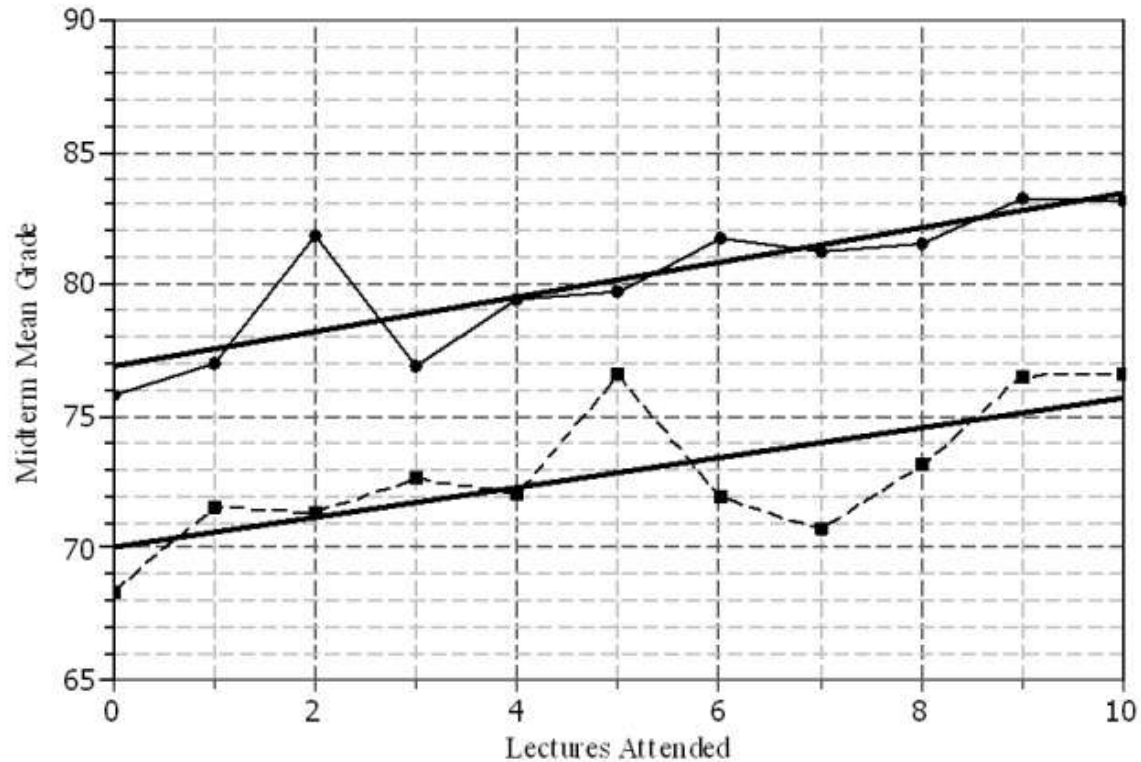
- In the spring 2011 semester students, who chose not to attend lecture, accessed the video recording on *Blackboard*<sup>TM</sup>.
  - *ECHO360*<sup>TM</sup> is the video recording system used to capture lectures at Binghamton University.
  - Links to the video were placed on *Blackboard*<sup>TM</sup> a few hours after the lecture.
- It was intended that attendance for students, who viewed the video recording, be taken when they accessed the recording on *Blackboard*<sup>TM</sup>.
- Students, who attended lecture, continued to have their attendance taken with the *iClicker*.

- Fall 2010 and spring 2011 mid-term examination scores were compared.
- The both exam scores were plotted as a function of the number of lectures attended in the spring.
- Spring 2011 lecture assignment scores were also plotted as a function of the number of lectures attended.

- Introduction
- Freshman Program
- Course Attendance Learning Study
- **Results**
- Conclusion

# *RESULTS*

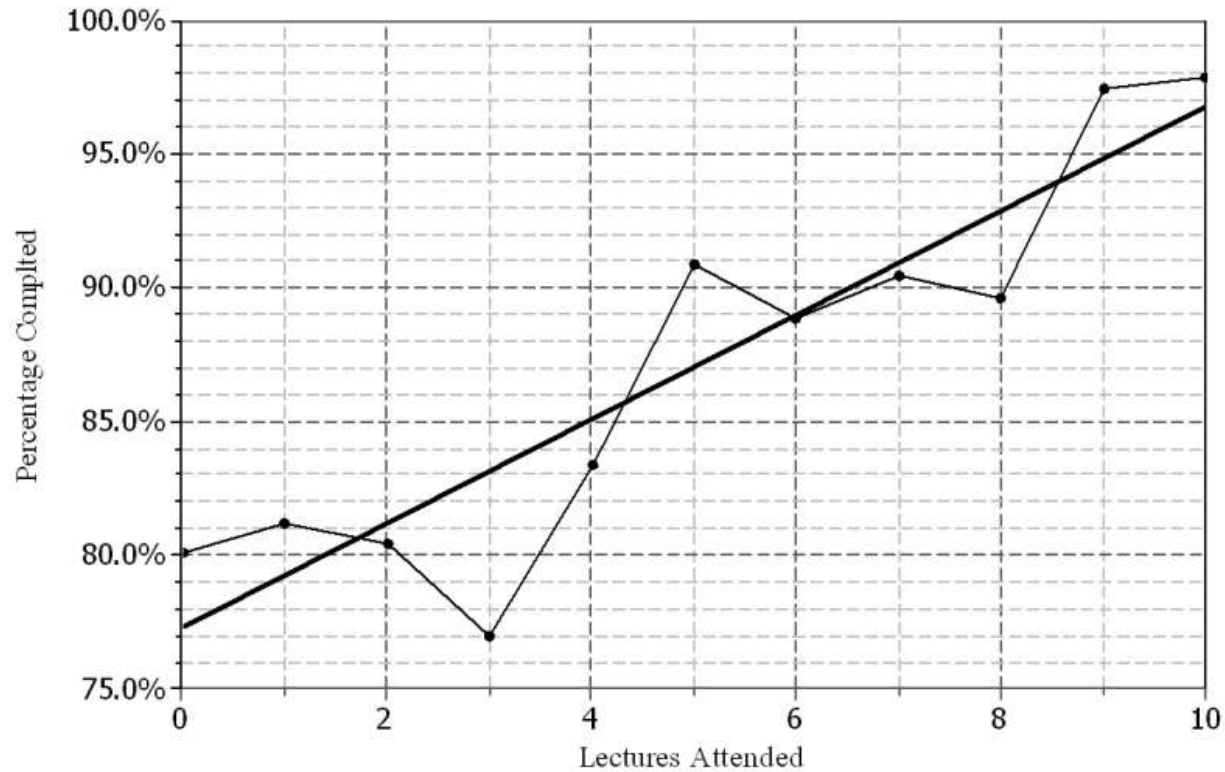
**ENGINEERING DESIGN DIVISION  
BINGHAMTON UNIVERSITY**



Fall 2010  
Std = 9.6

Spring 2011  
Std = 9.2

## MEAN MIDTERM GRADE COMPARISON



## Lecture Assignments Completed

- Introduction
- Freshman Program
- Course Attendance Learning Study
- Results
- **Conclusion**

# ***CONCLUSION***

**ENGINEERING DESIGN DIVISION  
BINGHAMTON UNIVERSITY**



- Attendance in lecture in the spring 2011 Exploring Engineering II course did not adversely affect student learning as measured on the midterm exam.
  - Student performance is more likely affected by study habits, unrelated to lecture attendance.
  - This is supported by the lecture assignments completed data.

- In the future the study should be repeated with the *Blackboard*<sup>TM</sup> tracking feature fixed.
- The authors would like to expand the study to a more diverse group of student learners, perhaps in partnership with another school.

***Any questions?***

1. Felder, Richard M. and Linda K. Silverman. 1988. "Learning and Teaching Styles in Engineering Education". *Engineering Education*. Vol. 78(7), pp. 674-681.
2. Massingham, Peter. 2006. "Does Attendance Matter? An Examination of Student Attitudes, Participation, Performance and Attendance". *Journal of University Teaching and Learning Practice*. Vol. 3/2. pp. 82-103.
3. Purcell, Patrick. "Engineering Student Attendance at Lectures: Effect on Examination Performance". September 3-7, 2003. In International Conference on Engineering Education. *Proceedings of the International Conference on Engineering Education*. Coimbra, Portugal.
4. Lockwood, Peter, Chris Guppy, and Robyn Smyth. "Should lectures be compulsory?". In UniServe Science Assessment Symposium. 2006. *UniServe Science Assessment Symposium Proceedings*. pp. 178-183.
5. Office of Technology for Education. Carnegie Mellon. "Lecture Webcasting: A Teaching with Technology White Paper". In *Teaching with Technology*. January 2007