"The Use of an Audience Response System to Collect Real-Time Student"

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Need for the Study

- Teaching styles vary
- Learning styles vary
- Constrained resources
  - Large class enrollments, fewer sections, fewer teaching resources
- What is a best fit?

Literature

- Historical
  - Divide within the discipline as to what the primary role of the animal science (husbandry) department is
  - Trend to focus less on technical skills of animal husbandry
    - Train farmers (Hultz, 1930; Frost 1936)
    - Train students to think (Rice 1945; Gustavson, 1965)
    - To train scientists (Kildee, 1935; Young, 1968)
    - To arm students with the ability to think, reason and question (Kaufman, et.al.,1984)

Teaching

- Teachers and Learners all have unique styles
  - Meyer's Briggs type indicator
  - Fleming's VARK
  - David Kolb's model
  - Honey and Mumford's
  - Anthony Gregorc's model
  - Sudbury model of democratic education
  - and others

Literature on Teaching

- Most learners are multi-modal
  - Fleming, 1995
- Best approach is to vary instructional methods
  - Chickering and Gamson 1987; Walker et. al., 2008

Methods

- Collected data from the AVS 150 Introductory Animal Science Class, fall of 2008
- Used I-clickers to have students respond to knowledge questions & their level of engagement
- Identified 10-15 minute periods of lecture that conformed to a "single" type of teaching

Data Collection

- Students were posed a knowledge question
  - Given 30 seconds to respond
  - Students respond as many times as they want
  - The system only records the last entry

i-Clicker Question

- An inbred individual is expected to:
  1. Be a poorer choice as a parent
  2. Have lower performance as a result of being more homozygous at a given loci
  3. Be the source of more genetic mutations
  4. All of the above

Data Collection

- Students are then asked about their level of engagement in classroom activities

i-Clicker Question

- On a scale of 1-5 (1=completely disengaged and 5=very engaged) rate your level of engagement in the classroom activities
  - A. 1
  - B. 2
  - C. 3
  - D. 4
  - E. 5

Data Collection

- Over the course of the semester
  - 58 pairs of knowledge / engagement questions collected

  - 33 "perfect pairs"
    - 11 traditional lecture
    - 13 technology enhanced lecture
    - 9 Web-enhanced lectures

Types of Teaching

- Traditional
  - Instructor with aid of white board, willing to interact with the class and ask questions

Types of Teaching

- Technology Enhanced
  - Instructor with aid of PowerPoint, Internet, etc. willing to interact with the class and ask questions

Types of Teaching

- Web-enhanced
  - Students are posed a question (problem-based learning / case based learning) and given 10-15 minutes to offer a solution.
    - Students are required to bring laptops (to take quizzes)
    - The classroom offers both Ethernet connection and wireless Internet accessibility

The Analysis

- Descriptive
  - Mean
  - Variation
  - Analysis of Variance (ANOVA)
- Inferential
  - Pearson's Chi-Square
  - Cramer's ɸ (Cramer's V)

Conclusions

- Level of engagement is not a reliable predictor of likelihood that a student answers a question correctly

Thoughts

- Animal Science Analogy
  - Nutrition
    - A quality feedstuff is of little value if not consumed or digested
  - Education
   - quality subject matter is of little value if it is not consumed or digested

Thoughts

- Reasons for lack of meaningful findings
  - Difficult to develop consistently meaningful questions ahead of time
  - We may not be looking in the right places
    - what are the effects of day of the week, time during the semester, etc.

Thoughts

- There are ways to increase engagement
  - Is increased engagement a worthy goal with no meaningful increase in learning?

Self Reported Engagement
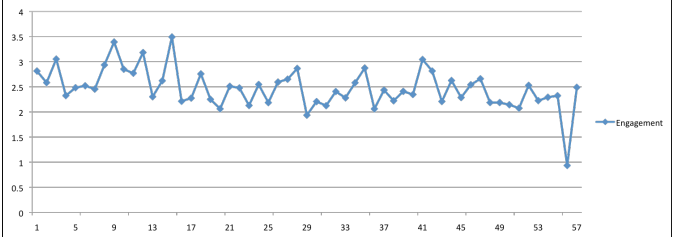
Future Work

- Use daily quizzes as an indicator of knowledge acquisition as opposed to single opportunity questions
- Focus first on collecting meaningful engagement data then on its relationship to learning
- The motive remains the same- improve a student's chance of success

Future Work

- Assess engagement every 10 minutes in class
  - Identify tendencies by
    - Day of the week
    - Time of the semester
    - Relative to other events
    - Compare against gender, etc.

Thank You!

Questions?