“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 φ (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?