

Interactive Forms of Classroom Assessment

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Talk Overview

- ❖ Theory behind non-traditional assessment
- ❖ Types of student engagement as forms of assessment
- ❖ Preliminary data from a small classroom

Constructivist Learning

- ❖ Meaning and knowledge is not transmitted passively
- ❖ Rather, meaning is created through engagement in activities or experiential events



Active Processing

- ❖ Active processing of the material increases student learning (Reif, 2008).
- ❖ Disadvantages of traditional lectures is they lack student engagement.
- ❖ How do we increase engagement?

Types of Engagement

❖ iClicker



❖ OBOW Exams



❖ Experiential Education



❖ Integration Papers



The iClicker

- ❖ Can substantially improve students' learning via active engagement and immediate feedback of correct and incorrect responses (Crouch & Mazur, 2001).
- ❖ Feedback loop increases learning - level of student comprehension garnered in order to provide clarity on certain concepts (Crouch & Mazur, 2001).



How do we use the iClicker in class?

Let's Try It!

Question 1

Which of the following were/was listed in the “Types of Engagement” this talk will cover?

- A. iClickers
- B. OBOW Exams
- C. Service Learning
- D. All of the above
- E. Only A & B

Question 1

Which of the following were/was listed in the “Types of Engagement” this talk will cover?

- A. iClickers
- B. OBOW Exams
- C. Service Learning
- D. All of the above
- E. Only A & B**

Question 2

What has been your experience using a classroom response system either as an instructor or a student?

- A. I have never used it in the classroom
- B. I found it to be a hassle
- C. I enjoyed the interaction between instructor and students
- D. I am interested in trying it but fear it will be problematic
- E. I am not yet convinced of its educational value

Types of iClicker Questions

- ❖ Application
 - ❖ Checking Comprehension
- ❖ Critical Thinking
 - ❖ Discussion Facilitation
- ❖ Classroom Opinions
 - ❖ Discussion Facilitation
- ❖ Self-Exploration & Social Comparison
 - ❖ Questionnaire scores

OBOW Exam: What it is?

- ❖ Open book, open web unit exam
 - ❖ Timed



OBOW Exams Promote Learning

- ❖ Open-book tests promote and assess learning more effectively than traditional closed-book tests (Cnop & Grandsard, 1994; Eilertsen & Valdermo, 2000; Heijne-Penninga, Kuks, Schonrock-Adema, Snijders, & Cohen-Schotanus, 2008; Theophilides & Dionysiou, 1996; Theophilides & Koutselini, 2000).
- ❖ Open-book tests encourage the use of higher-level thinking skills such as problem solving and reasoning (Jacobs & Chase, 1992; Feller, 1994).
- ❖ Studies have found that open-book exams produce better initial test performance and similar or better long-term retention than traditional closed-book exams (Agarwal, Karpicke, Kang, Roediger, & McDermott, 2008; Di Vesta, 1954).

OBOW Exams: Student Impact

- ❖ Students report less stress and anxiety when preparing for open-book tests (Weber, McBee, & Krebs, 1983; Theophilides & Dionysiou, 1996).
- ❖ Students can perform worse on OBOW exams based on less and/or ineffective preparation/studying (Weber, McBee, & Krebs, 1983).
 - ❖ Need to address the assumption in class that OBOW are inherently easier than traditional exam – they are not.

OBOW Exams: Cheating Concerns

- ❖ This assumes (1) that cheating is an easy thing to do within the OBOW model, and (2) students do not cheat in proctored paper and pencil examinations.
- ❖ Neither assumption is supported in research. Studies have shown that cheating is equally probable in either type of testing situation (Williams, 2006).
- ❖ Further, cheating can be detected more readily in the OBOW format.

OBOW Exams –

❖ Williams (2006) argues traditional exams are an anachronism and do not reflect of the deep learning and skill mastery needed for the workplace.

(a) Boss to employee: *Look, we've got a real problem here ... you've got an MBA haven't you? Can you write me a report on this, and email it to me by 9am tomorrow?*

(b) Boss to employee: *Look, we've got a real problem here ... you've got an MBA haven't you? Can you lock yourself away in that room, don't talk to anyone, don't browse the web or open any books, and give me your answers to these multiple-choice questions in 3 hours time?*

Experiential Education: What is it?

Type of hands on learning experience

- ❖ Tai Chi
- ❖ Licensed Nutritionist Presentation
- ❖ SafeZone Presentation

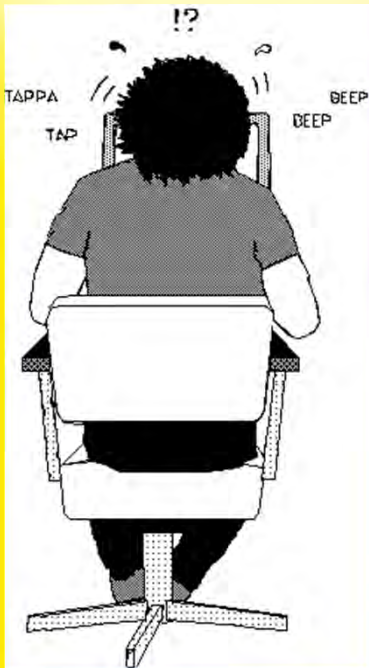


Experiential Education Promoting Learning

- ❖ Participation enhances appreciation for diversity
(Seaman, Beightol, Shirilla & Crawford, 2009).
- ❖ Recall and reproduction of material in the classroom is not considered understanding; for acquired knowledge to be usable, it must be applied to a situation (Eyler, 2009).
- ❖ Can help students achieve intellectual goals:
 - capacity for critical thinking
 - ability to engage in lifelong learning

Integration Papers: What are they?

❖ Assigned papers on various health related topics for the purpose of encouraging students to connect material learned inside the classroom with resources outside of the classroom



Integration Papers

Promote Learning

- ❖ Increasing the depth of processing and the degree of elaboration of course material increases remembering and learning (Lockhart & Craik, 1990).
- ❖ Degree of elaboration is increased in these papers by drawing connections between sources and making application to your personal health.
- ❖ Multi-modal form of learning
 - ❖ Videos
 - ❖ Research Articles
 - ❖ Websites
 - ❖ Book Chapters

Quantitative Data from a Health Psychology Course

Does experiential education, such as participating in and physically learning Tai Chi, increase exam performance on the health benefits of Tai Chi after controlling for student's academic skill level as shown by final course grade?

Results

YES

Hierarchical Regression

1. The student's final course grade is entered
2. Attendance at the Rec Center for Tai Chi demonstration. This attendance is used to predict exam scores on health benefits of Tai Chi.

$F(2, 19) = 76.89, p < .001, R^{2\Delta} = .03, p = .05, \text{TaiChi} = .23, p = .05$

Quantitative Data from a Health Psychology Course

Do integration papers increase exam
performance on the related material after
controlling for student's academic skill level
as shown by final course grade?

Results

YES

Hierarchical Regression

1. The student's final course grade is entered
2. Integration Paper grades on cancer predicting exam performance on cancer.

$F(2, 19) = 117.97, p < .001, R^2\Delta = .06, p = .001,$
Integration paper = .50, $p = .002$

In Summary

- ❖ A constructivist learning approach emphasizes student engagement to improve learning outcomes.
- ❖ Interactive forms of classroom assessment can create in-depth processing and learning.
- ❖ A current classroom of 111 students will be analyzed upon the completion of the fall 2010 semester.

References

- Agarwal, P. K., Karpicke, J. D., Kang, S. H., Roediger, H. L., & McDermott, K. B. (2008). Examining the testing effect with open- and closed-book tests. *Applied Cognitive Psychology*, 22, 861-876.
- Cnop, I., & Grandsard, F. (1994). An open-book exam for non-mathematics majors. *International Journal of Mathematical Education in Science and Technology*, 25 (1), 125-130.
- Crouch, C. H. & Mazur, E. (2001). Peer instruction: Ten years of experience and results. *American Journal of Physics*, 69 (9), 970-977.
- Di Vesta, F. J. (1954). The effect of methods of presentation and examining conditions on student achievement in a correspondence course. *Journal of Applied Psychology*, 38 (4), 253-255.
- Eilertsen, T. V., & Valdermo, O. (2000). Open-book assessment: A contribution to improved learning? *Studies in Educational Evaluation*, 26, 91-103.
- Eyler, J. (2009). Power of Experiential Education. *The Association of American Colleges and Universities*, pp. 24-31.
- Feller, M. (1994). Open-book testing and education for the future. *Studies in Educational Evaluation*, 20, 235-238.
- Heijne-Penninga, M., Kuks, J. B. M., Schonrock-Adema, J., Snijders, T. A. B., & Cohen-Schotanus, J. (2008). Open-book tests to complement assessment-programmes: Analysis of open and closed-book tests. *Advances in Health Sciences Education*, 13, 263-273.
- Jacobs, L., & Chase, C. (1992). *Developing and using tests effectively*. San Francisco: Jossey-Bass.
- Lockhart, R. S., & Craik, F. I. M. (1990). Levels of processing: A retrospective commentary on a framework for memory research. *Canadian Journal of Psychology*, 44 (1), 87-112.
- Reif, F. (2008). Applying cognitive science to education: Thinking and learning in scientific and other complex domains. Cambridge, Massachusetts: The MIT Press.
- Seaman, J., Beightol, J., Shirilla, P., Crawford, B. (2009). Contact Theory as a Framework for Experiential Activities as Diversity Education: An Exploratory Study. *Journal of Experiential Education*, 32, 3, 207-225.
- Theophilides, C., & Dionysiou, O. (1996). The major functions of the open-book test at the university level: A factor analytic study. *Studies in Educational Evaluation*, 22, 157-170.
- Theophilides, C., & Koutselini, M. (2000). Study behavior in the closed-book and the open-book test: A comparative analysis. *Educational Research and Evaluation*, 6, 379-393.
- Weber, L. J., McBee, J. K., & Krebs, J. E. (1983). Take home tests: An experimental study. *Research in Higher Education*, 18 (4), 473-483.
- Williams, J. B. (2006). The place of the closed book, invigilated final examination in a knowledge economy. *Educational Media International*, 43, (2), 107-119.

Questions?

