



QUESTIONING TECHNIQUES:

HOW TO DEVELOP | HOW TO DELIVER

SYRACUSE UNIVERSITY
School of Information Studies



Advantages and disadvantages



How to deliver




Types of assessment questions



Why ask questions?

Outline

WHY ASK QUESTIONS?

- 
- To actively involve students in the lesson
 - To increase motivation or interest
 - To evaluate students' preparation
 - To check on completion of work
 - To develop critical thinking skills
 - To review previous lessons
 - To nurture insights



Prior knowledge is critical to developing learning that is appropriate to what students already know and to build upon that knowledge.

Interactive classroom assessment techniques using clicker technology – Oregon IL Summit 2012





SUMMATIVE ASSESSMENT

- ☐ Graded activities
 - ☐ multiple-choice quizzes or tests
- ☐ Self-paced

"When the cook tastes the soup, that's formative;
when the guests taste the soup, that's summative."

--Evaluator Robert Stake describing the difference in formative and summative assessment



FORMATIVE ASSESSMENT

- ☐ Real Time Information for learning
 - ☐ For both student and instructor
- ☐ Monitor own learning – students
- ☐ Manage class “on the fly” - instructors

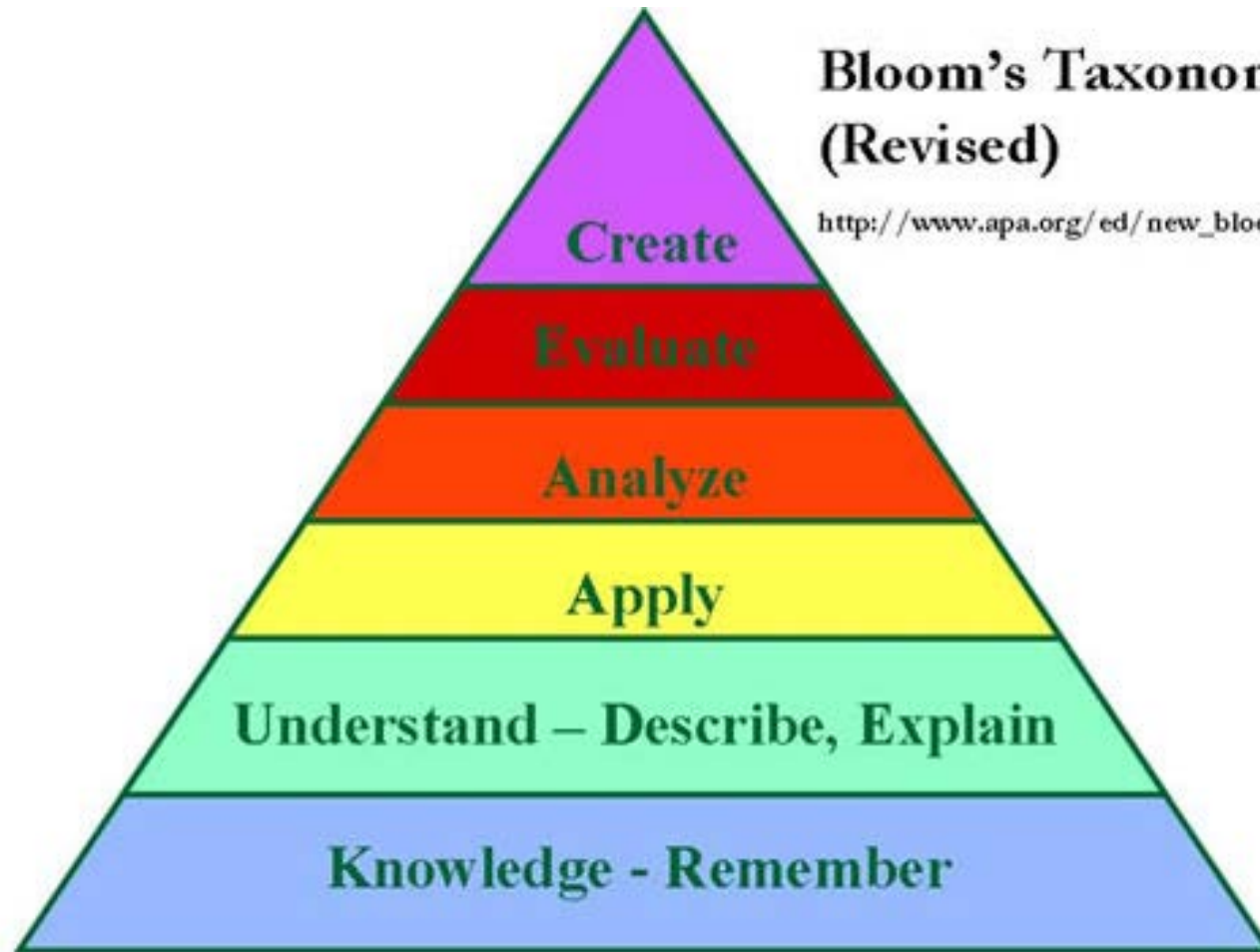
**"When the cook tastes the soup, that's formative;
when the guests taste the soup, that's summative."**
*–Evaluator Robert Stake describing the difference in formative and
summative assessment*

Ongoing formative assessment directs the course of instruction making sure students are achieving the desired outcomes.

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BLOOMS TAXONOMY



**Bloom's Taxonomy
(Revised)**

http://www.apa.org/ed/new_blooms.html



Assessment with Polls

Teaching and learning goals can be ordered using **Bloom's Taxonomy**

Knowledge

memorization and recall

Understand

comprehend

Application

using knowledge

Analysis

taking apart information

Evaluate

making judgments

Create

designing

**Right/Wrong
answers**

More complex questions call for more sophisticated guides and responses

**Degrees of
correctness**





Why Wait!

Mary Budd Rowe
– Research 1986

Slowing down
may be a way of
speeding up!

Three seconds



Payoff from Pausing!

Relevant student responses increase significantly

Number of unsolicited responses increase

Students who typically avoid participating, take part

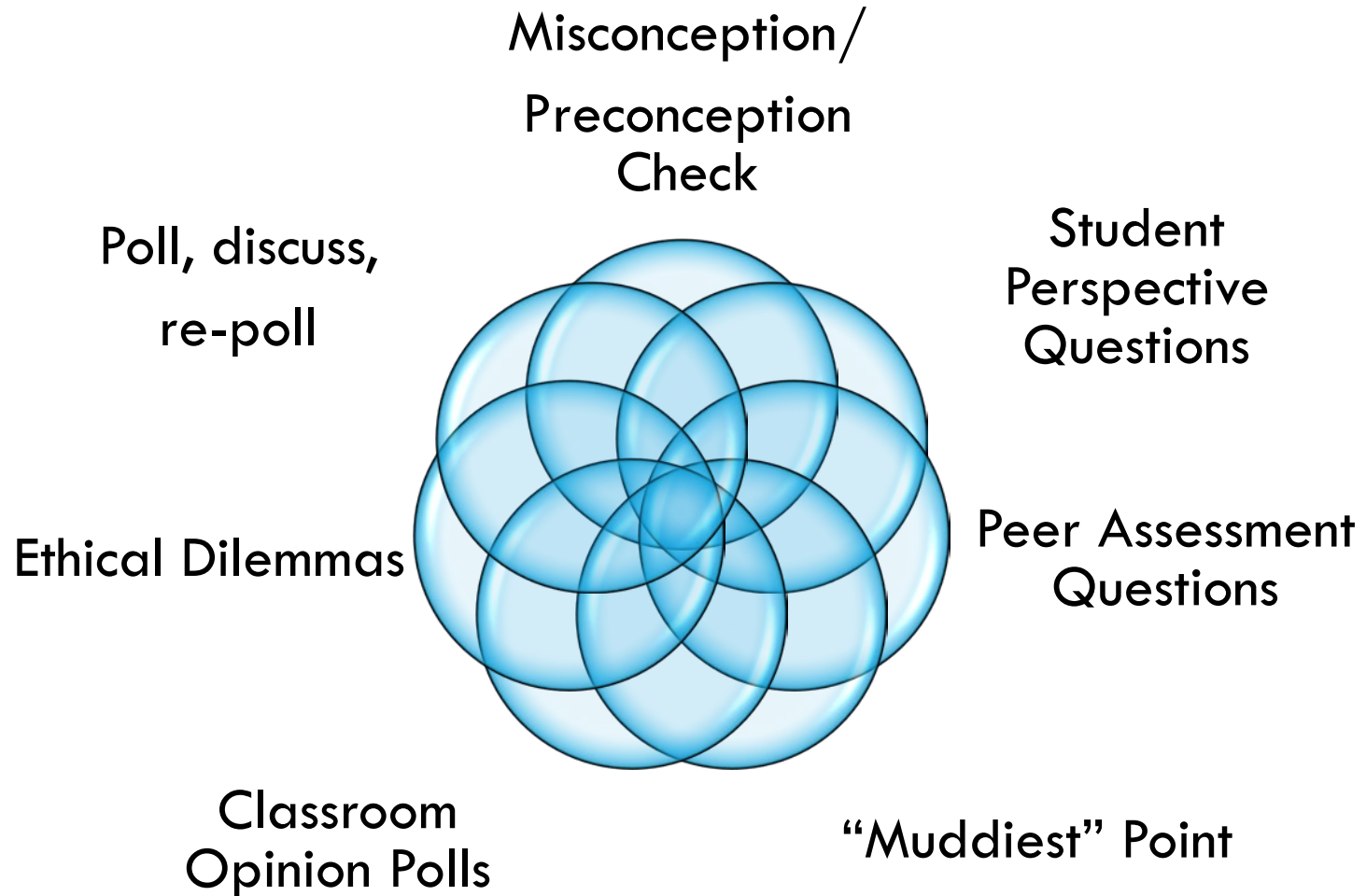
Introverts & slower processors contributions increase

What we know about student learning

1. *Students learn key concepts better when they have opportunities to actively monitor their understanding.*
2. *Knowledge is socially constructed and people learn best in supportive social settings when working with peers.*
3. *Students become better learners when we challenge them to answer questions that require the use of higher order thinking skills.*



TYPES OF POLL QUESTIONS





Pedagogy for Feedback Devices

Peer instruction (& Conceptests)

Development of technique by Eric Mazur, Harvard

- ✓ Short lecture (10-20 minutes)
- ✓ Conceptest – conceptual multiple choice question
- ✓ Individual students signal answers
- ✓ Student groups may discuss answers (peer instruction)
- ✓ Explanation of correct answer

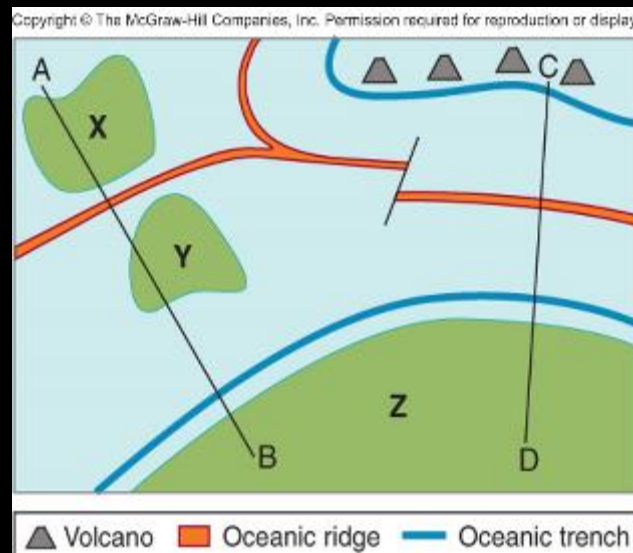
Example: Earth Science Concepttest

Examine the map and answer the question that follows. How many plates are present?

- a. 3 (26%; 0%) c. 5 (44%; 75%)
b. 4 (19%; 18%) d. 6 (11%; 7%)

1. Individual responses

2. Post-discussion responses



Impact of Alternative Pedagogy

Poulis et al., (1998)

- Results from 5,000+ physics students – increase in pass rates (55% → 80%) in classes that used audience paced feedback (poll + student discussion)

Poulis, C., Massen, C., Robens, E., & Gilbert, M. 1998. *American Journal of Physics*, v.66 #5, p. 439-441.

Dori & Belcher (2004)

- Compared pre- and post-test scores for traditional and technology-enabled physics classes – learning gains were greater (27% vs. 52%) for technology enhanced class

Dori, Y.J. and J. Belcher, J. 2004. *Journal of the Learning Sciences* 14(2).

POLL TECHNOLOGY

- ☐ Simple to use
- ☐ Interactive
- ☐ Provides real-time feedback
- ☐ Everyone participates
- ☐ Assess prior knowledge
- ☐ Formative assessment





KNOWLEDGE = REMEMBERING

- ☐ Relevant facts or Procedures
- ☐ Recall Questions
- ☐ Facts before deeper understanding
- ☐ Base knowledge





THE CHILD APPRIZED HER FATHER'S
AUTHORITY AND BEHAVED HERSELF AT
THE CEREMONY. **APPRIZED MEANS**

- A. Appreciated
- B. Compromised
- C. Defied
- D. Noted





COMPREHENSION = UNDERSTANDING

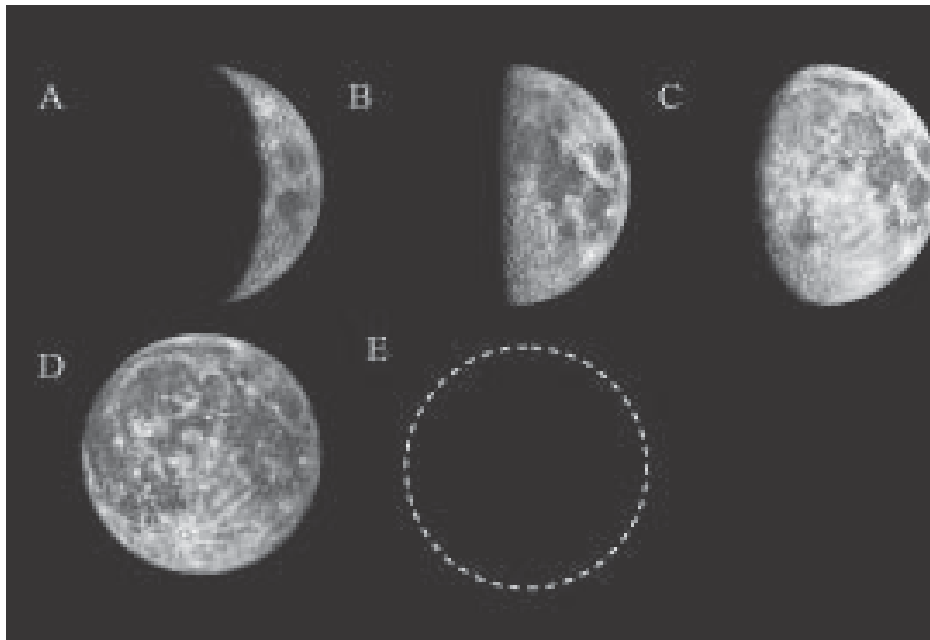
- ❑ Not only recall but also understand
- ❑ Useful for leading class discussions



Understanding
is much deeper than knowledge.
There are *many* who know you,
but very few who understand *you*.

YOU LOOK TO THE EASTERN HORIZON AS THE MOON IS RISING AND DISCOVER THAT IT IS IN THE NEW MOON PHASE. LATER THAT SAME DAY WHEN THE MOON IS SETTING, WHICH OF THE MOON PHASES SHOWN BELOW WOULD THE MOON HAVE LOOKED LIKE?

- A.
- B.
- C.
- D.
- E.



APPLICATION

- Apply knowledge to particular situations and contexts



BASED ON THE FACTS OF PROBLEM 7 [IN THE TEXTBOOK], IN THE LAWSUIT BY THE STUDENT AGAINST MOUNTAIN LAW SCHOOL, A COURT WILL LIKELY FIND IN FAVOR OF THE:

- A. Student, if the court finds that the terms of the catalogue are complete, definite and certain
- B. Student, since catalogues are never considered ads, and ads are always offers
- C. Law school, since catalogues can never include all the necessary terms to be deemed definite and complete offers
- D. Law school, since the student could not have expected to be taught all the terms included in the catalogue



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RR IS A 22-YEAR-OLD MEXICAN AMERICAN NEWLY DIAGNOSED WITH TYPE 1 DIABETES. HE WEIGHS 68 KG. YOU NEED TO START HIM ON AN INSULIN REGIMEN. HE HAS NO INSURANCE, DID NOT COMPLETE HIGH SCHOOL, AND SPEAKS LIMITED ENGLISH. WHAT IS THE BEST INSULIN REGIMEN TO START HIM ON?

- A. Glargine 15 units at bedtime plus sliding-scale lispro with meals
- B. NPH 30 units twice daily
- C. Mixed insulin 70/30, 20 units in the morning and 10 units at bedtime
- D. Glargine 15 units at bedtime and lispro 5 units with meals
- E. Levemir 15 units twice daily





EVALUATION

- ☐ Individual judgments
- ☐ Evaluation of other judgments
- ☐ Self-evaluation important





IF YOU WERE A JUDGE, HOW WOULD YOU ASSESS THE “RESPONSIBILITY” OF THE U.S. GOVERNMENT, FOR WHAT HAPPENED IN THE WORLD BETWEEN 1933 AND 1945?

- A. Not responsible
- B. Minimally responsible
- C. Responsible
- D. Very responsible





CREATION

- ☐ Modify
- ☐ Propose
- ☐ Verify
- ☐ Arrange



WHAT CHANGES WOULD YOU MAKE TO
PRESERVE IP ADDRESSES FOR THE FUTURE?
USE THE DISCUSSION BOARD IN
BLACKBOARD AND SIGNAL WHEN YOU ARE
DONE.

A. I am done

B. I need more time





ADVANTAGES OF POLLS?

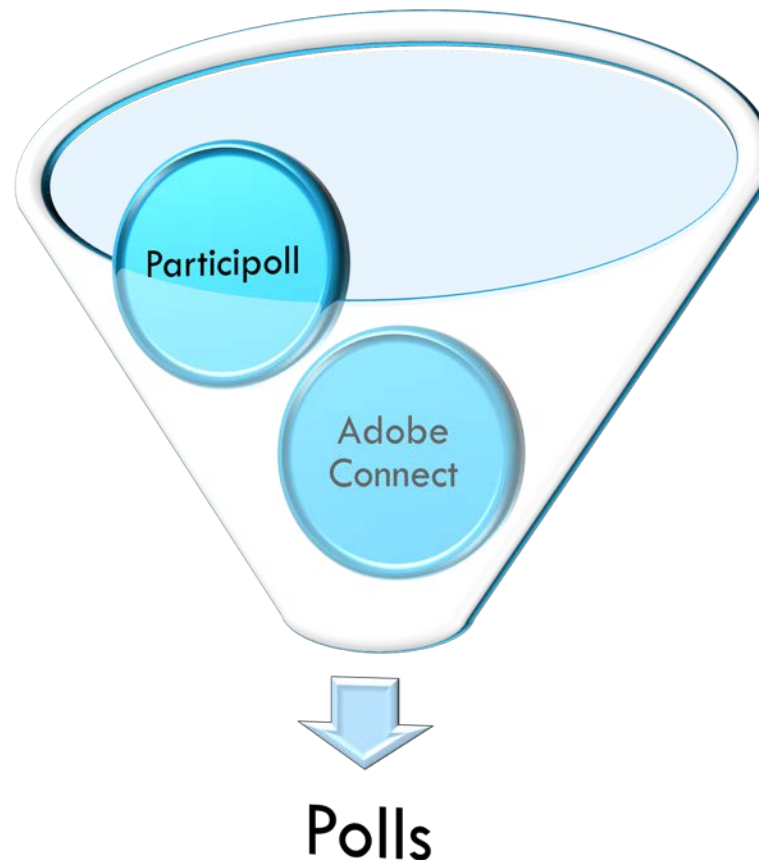
1. FEEDBACK
2. more ACTIVE and ACCOUNTABLE
3. ANONYMOUS
4. *STUDENT ENTHUSIASM*
5. GAUGE
6. Increase STUDENT'S LEARNING and RETENTION
7. Facilitate DISCUSSION/DEBATE and PEER TEACHING
8. ATTENDANCE
9. "TROUBLE SPOTS"



DISADVANTAGES OF POLLS?

1. Technology may FAIL
2. COST
3. Extra STEPS
4. TIME
5. EFFECTIVE POLL QUESTIONS
6. ADMINISTRATIVE BURDEN

TYPES OF STUDENT RESPONSE SYSTEMS



STUDENT FEEDBACK

“Makes the course more interesting. Students can better concentrate on the topic...”

“Makes it fun to learn..”

“It was nice to get a good idea of how well I was doing with respect to the class”

“I was actually **thinking in class, not copying text**”

“Help understanding and give emphasis to concepts rather than derivations...I learned more in this class than any other in first year”

INTERACTIVE TEACHING BEST PRACTICES

