

Knowledge check questions: Is interactivity warranted during a narrated presentation?



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Agenda

- What is a “knowledge check question?”
- Instructional Design Guidelines
- Literature
- Study & Results

Knowledge Check Question

The screenshot shows a Mozilla Firefox browser window with the title "Arboviruses 2 - Mozilla Firefox". The address bar displays the URL http://eta.health.usf.edu/publichealth/EID/F09/Arboviruses2_KC/player.html. The browser's search bar contains the text "oatmeal carb".

The main content area of the browser shows a presentation titled "Arboviruses 2" with a progress indicator "(03:47 / 36:39)". The presentation is powered by Articulate, and the "Knowledge Check" slide is currently active. The slide title is "Knowledge Check" and it is labeled "Question 1 of 1" with a "Point Value: 1".

The question text is: "Encephalitis flaviviruses are transmitted between _____ and _____."

The possible answers are:

- ☐ humans; mosquitoes
- ☐ monkeys; mosquitoes
- ☐ birds ; mosquitoes

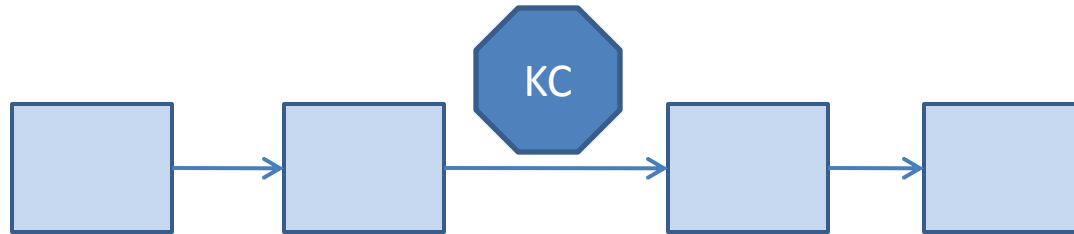
A "Submit" button is located at the bottom right of the question area. The score so far is displayed as "0 points out of 0".

The left sidebar of the presentation shows a table of contents with the following items:

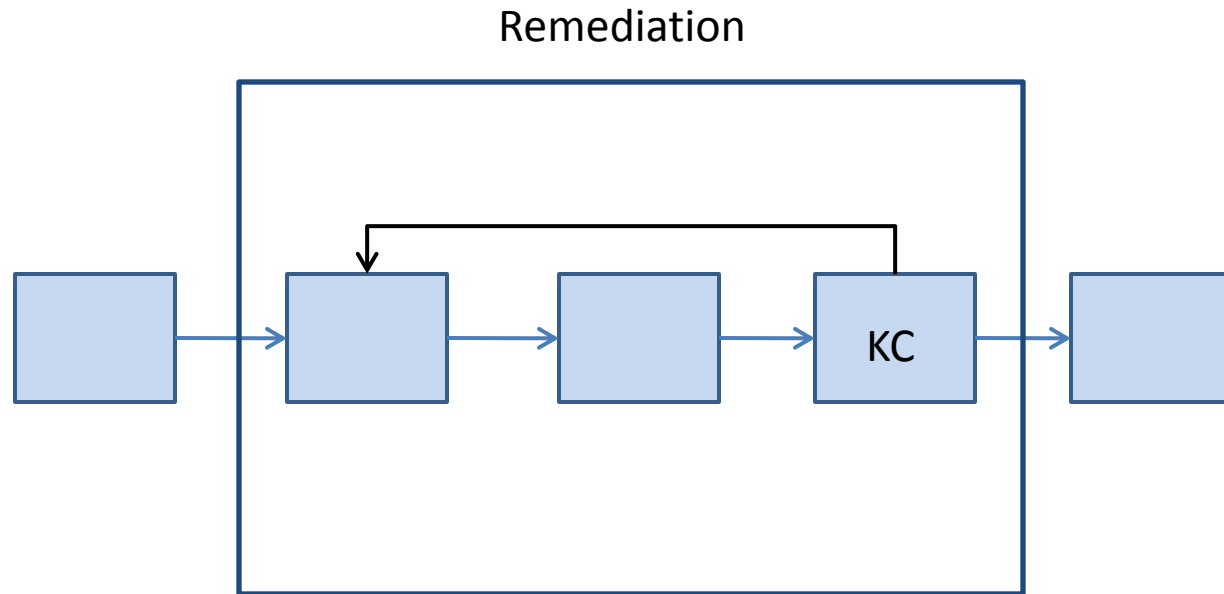
- 5. New York City 1999!
- 6. Knowledge Check
- 7. West Nile Virus
- 8. WNV Transmission
- 9. New World = New Territory
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- 29. JEV Transmission

The bottom of the browser window shows the "Done" status bar.

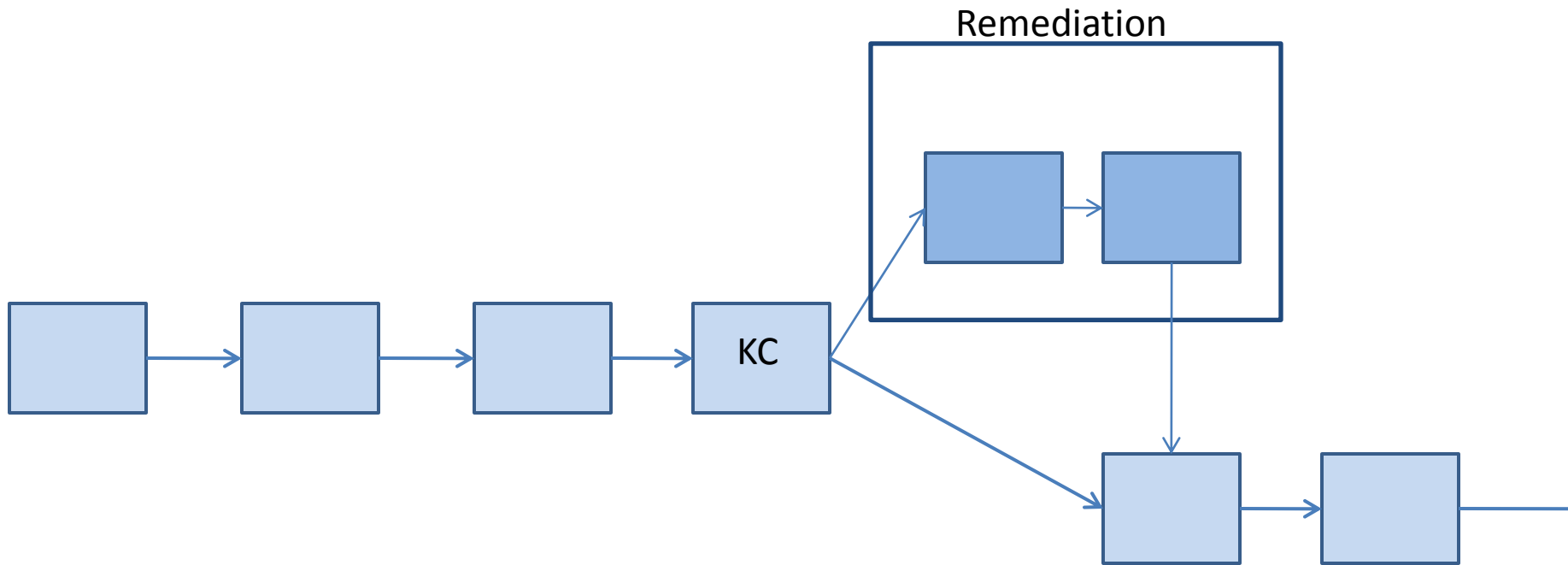
Creates a “stop” to the Instruction



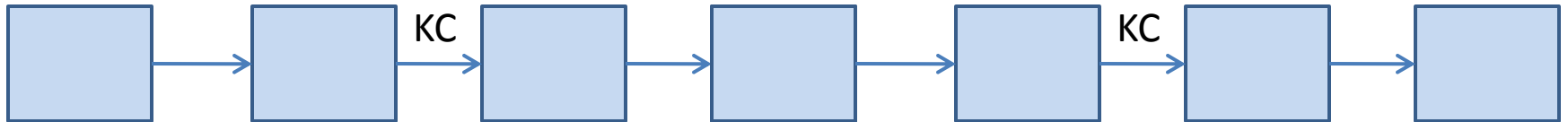
KC Question in Narrated Presentation



Remediation via branching

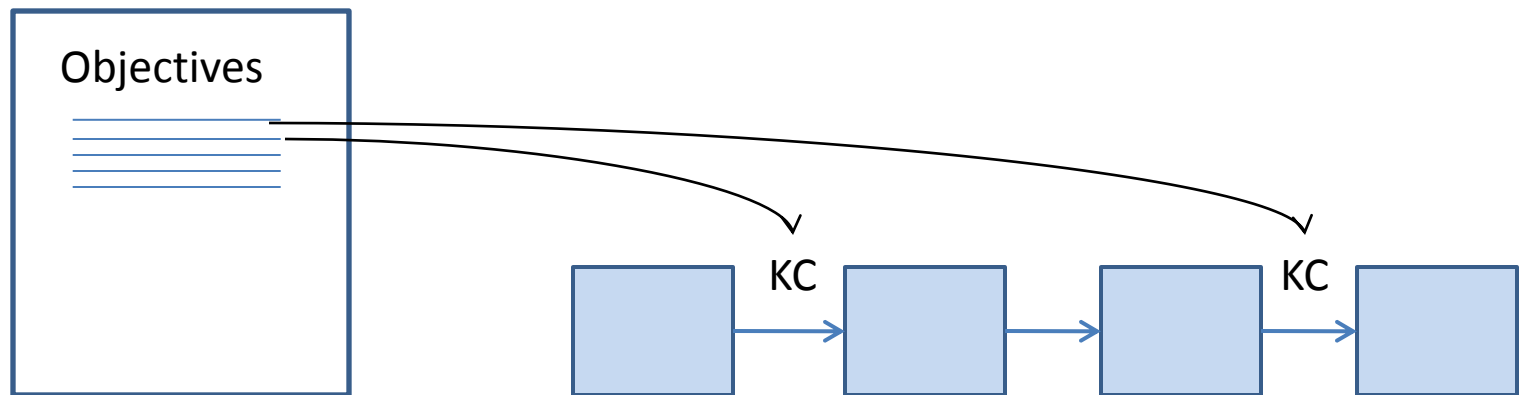


Where to use KC questions?

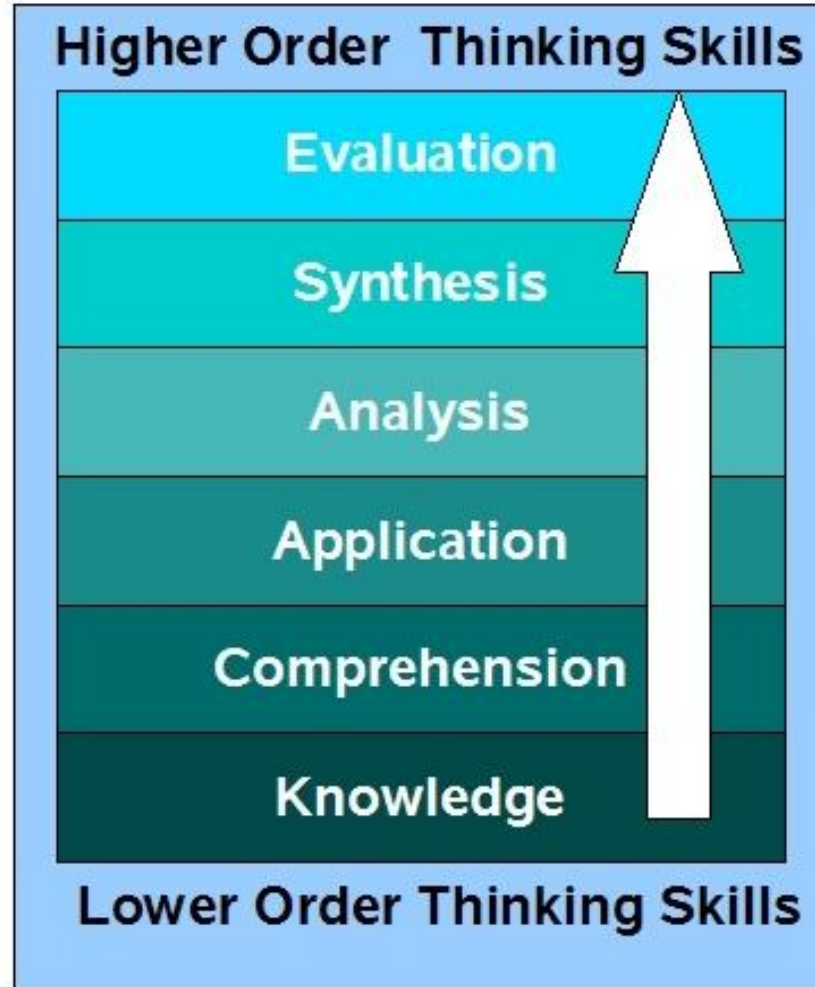


Based on Learning Objectives

- Reinforce the content of the objective
- Ensure the learning objectives have been met



Knowledge Check Questions & Blooms Taxonomy

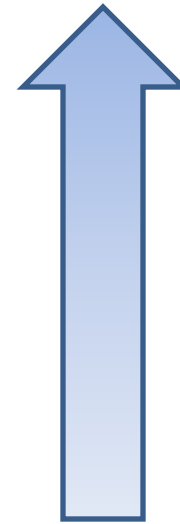


Learning? ... from a KC Question?

- learning results from:
 - the narrated presentation;
 - the presentation of the question and;
 - the feedback.

Types of feedback

- Elaborative feedback
- Diagnostic feedback
- Explanatory feedback
- Corrective feedback
- No Feedback – right/wrong



Specificity
increases

No Feedback- Right/Wrong

X Your answer was incorrect.

- the student still doesn't know why they were incorrect

Corrective feedback

X Your Answer was incorrect. The correct answer was Jefferson

- Tells the correct answer

Explanatory feedback

- ✗ Your answer was incorrect because Carter was from Georgia, only Jefferson called Virginia home.
- provides additional information

Diagnostic feedback

- ✗ Your answer was incorrect. Jefferson was the correct answer. *Your choice of Carter suggests some extra instruction on the home states of past presidents.*
- also provides suggestions of what the learner might study next

Elaborative feedback

- ✓ Your answer, Jefferson was correct. The University of Virginia, a campus rich with Jeffersonian architecture and writings, is sometimes referred to as Thomas Jefferson's school.
- provides information about particular responses

Elaborative feedback

- address the topic
- address the response
- discuss the particular error(s)
- provide worked examples, or;
- give gentle guidance.

A vertical bar on the left side of the slide, transitioning from dark blue at the top to light blue at the bottom.

Literature

Literature

- Extensive literature base
- Pressey (1920's)
- Skinner (1958) – Teaching machines
- Decades of clinical trials & classroom studies
- Literature
 - positive for more specific or elaborative feedback
 - mixed on the timing of feedback

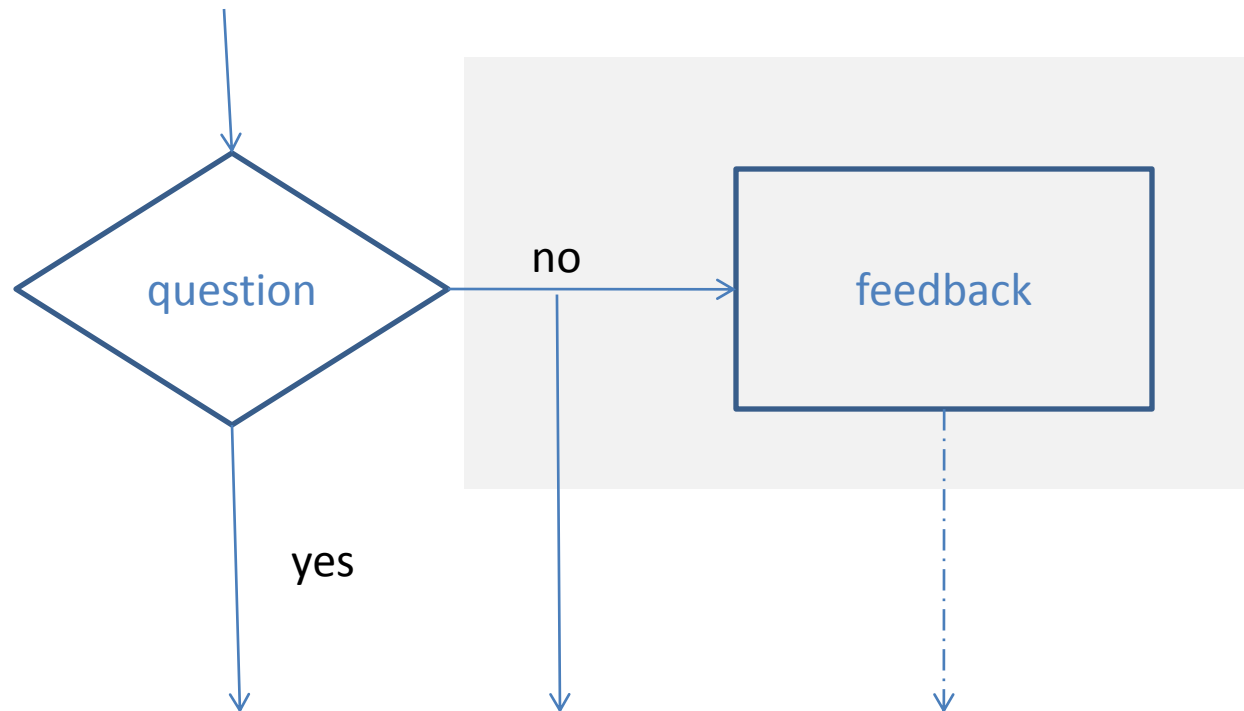
Timing of feedback

- Feedback ***immediately*** following the presentation of a question may be **detrimental to learning**

(Brackbill et al., 1962; Kulik & Kulik, 1988; Kulhavy & Anderson, 1972; Mory, 2004)

Kulhavy and Anderson (1972)

- “Interference-preservation theory”
- Incorrect response too close in time to feedback



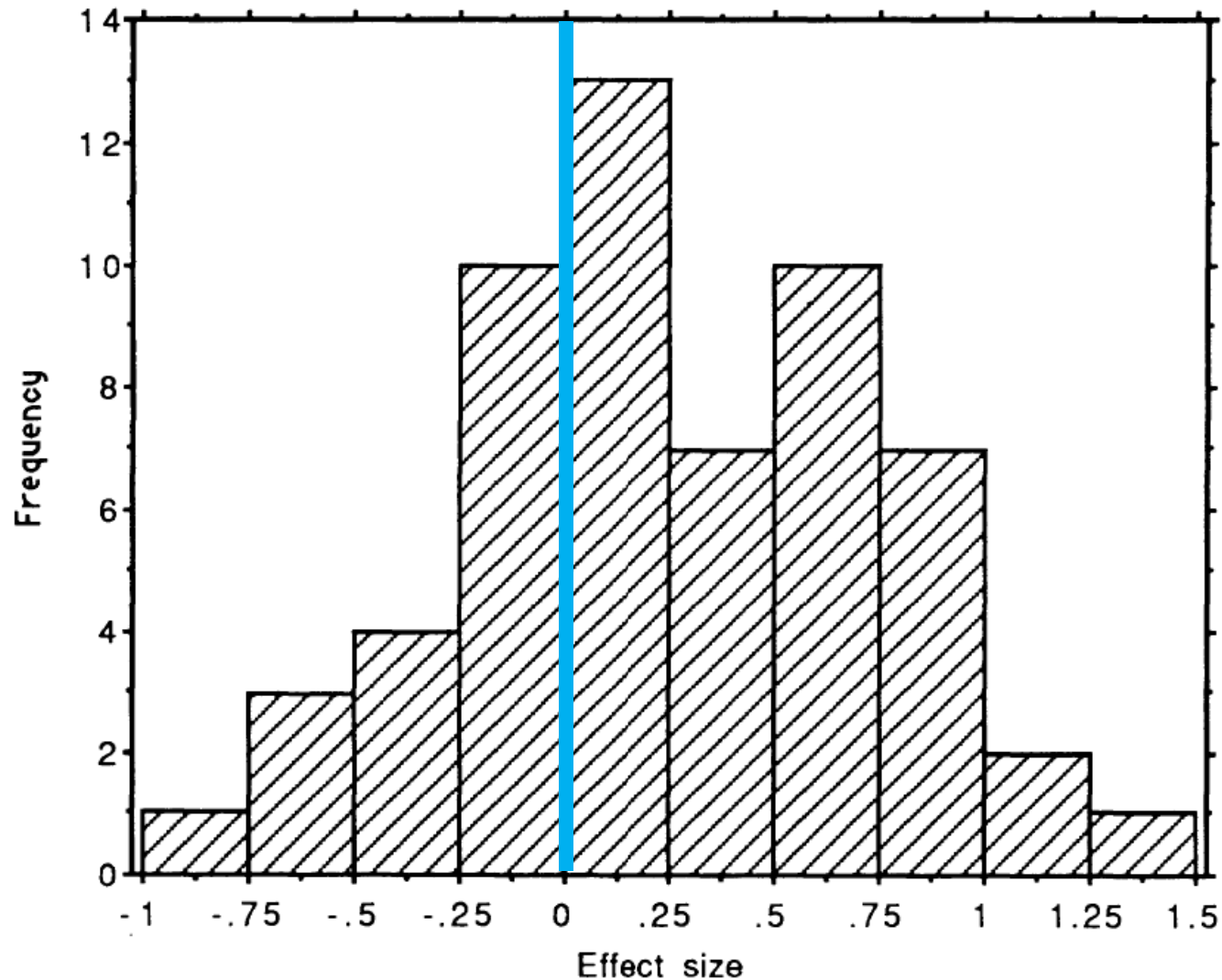
Delayed retention effect (DRE)

- Kulhavy and Anderson (1972)
- Found a positive learning effect for delaying feedback (a day or more)
- Controversial
 - Withholding information from the learner

“the feedback hypothesis”

- “law of effect”
- S->R animal studies
- humans react differently with language-based materials (Brackbill et al., 1962)

Feedback Literature

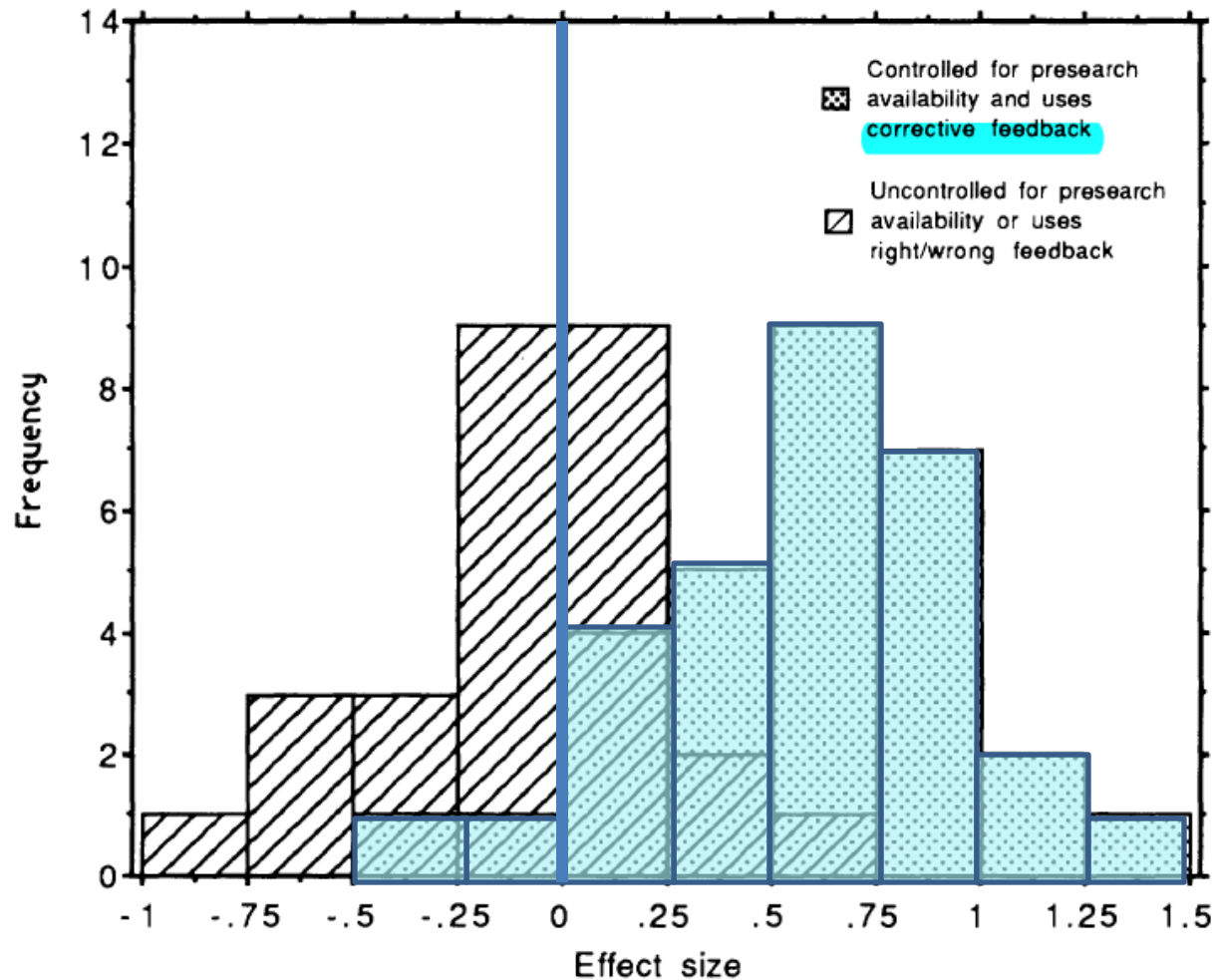


Source : Bangert-Drowns, Kulik, Kulik, Morgan, 1991

Components of Feedback

- Verification
- Other information acts as elaboration

Need for specificity in feedback



Instructional Design Guidelines

- Align KC questions with lesson objectives
- Raise the Bloom level (kick it up notch!)
- Provide detailed feedback for both correct and incorrect answers
- Use both components of feedback
 - Verification
 - Elaboration

Study & Results

Research Question & Hypotheses

Do knowledge check questions during a multimedia presentation impact student learning?

H_o Learner performance would be improved given the presentation of knowledge check questions

H_a Learner performance would not change given the presentation of knowledge check questions

Sample

Undergraduates in an online course
(Introduction to Public Health) ($n=284$)

Randomly assigned

- experimental group ($n=141$)
- control group ($n=143$)

Attrition

- experimental group ($n=136$) - 5
- control group ($n=140$) - 3

Knowledge Check Questions

The screenshot shows a Mozilla Firefox browser window displaying an Articulate presentation titled "Arboviruses 2". The address bar shows the URL http://eta.health.usf.edu/publichealth/EID/F09/Arboviruses2_KC/player.html. The presentation interface includes a sidebar with a table of contents, a main content area for a "Knowledge Check", and a bottom control bar.

Arboviruses 2 - Mozilla Firefox

File Edit View History Bookmarks Tools Help

[http://eta.health.usf.edu/publichealth/EID/F09/Arboviruses2_KC/player.html](#) oatmeal carb

Arboviruses 2 (03:47 / 36:39) ATTACHMENTS

articulate®

Outline Thumbnails Notes Search

- 5. New York City 1999!
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Knowledge Check

Question 1 of 1: Point Value: 1

Encephalitis flaviviruses are transmitted between _____ and _____.

- ☐ humans; mosquitoes
- ☐ monkeys; mosquitoes
- ☐ birds ; mosquitoes

Submit

Score so far: 0 points out of 0

articulate® POWERED PRESENTATION

SLIDE 6 OF 36 PLAYING 00:00 /

Done

Narrated presentations

- ranged in length from 34 to 72 minutes
- Subject matter
 - Tobacco
 - Diet
 - Health behaviors
 - Psychosocial Factors of Health behaviors
 - Poor health & Physical Inactivity
 - Injuries are not accidents

Results

Post-test scores

	Experimental group	Control group
<i>n</i>	136	140
post-test score		
<i>M</i>	38.44	37.07
<i>SD</i>	30.74	42.33

$$t(269) = 1.88, p = 0.061 \alpha=0.05$$

not significantly different

Discussion

Is interactivity warranted during a narrated presentation?

- Results
 - not a significant difference
- IF you use KC Questions
 - Give learners multiple chances to interact with the materials

Examples

- [Security and Privacy Awareness](#)
- [Arboviruses 1: Yellow Fever & Dengue Virus](#)
- [Chapter 15: Tobacco - Public Health Enemy #1](#)

<http://davidlewisphd.com>

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Acknowledgement

This material was based on work supported by the National Science Foundation, while working at the Foundation. Any opinion, finding, and conclusions or recommendations expressed in this material; are those of the author and do not necessarily reflect the views of the National Science Foundation.



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