How do you know your teaching strategies are working?

Action research in the classroom

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T&L Network Luncheon; February 11, 2009

Action Research

- Active inquiry that occurs *during* the teaching process
  - by those engaged in the process
  - in order to learn more about the process
  - leads to change that improves the process
- Action research does not require those engaged in the research to be assessment specialists

What is Action Research?

Instructors examine their own pedagogy and practice

- based on analysis and interpretation of methodically gathered data;
- in dialogue with other educators;
- with contributions from students as important partners.

Instructor identifies the research question

- Articulate a problem or experience in teaching.
- Define terms embedded in question.
- Narrow the question.
- Consider ethical issues, hidden biases and assumptions.

Finding an Answer

- Read pedagogical research related to the issues inherent in question.
- Consider methodology for gathering classroom data.
  - Recording digital video/audio
  - Gathering student artifacts/interviews
  - Inviting colleagues to observe

What is action research *not*?

- It is not simply reflecting on teaching.
  - Action research requires gathering and analyzing data.
- It is not just problem solving.
  - Action research is about improving teaching by learning about the effects of specific teaching strategies.

What is action research *not*?

- It is not research on others by an outside entity.
  - Action research is research by individuals who wish to improve what they do.
- It is not the scientific method applied to teaching.
  - Data gathered by the researcher is used to change the researcher and the classroom in which the researcher is embedded.

Steps in Action Research

- Define a meaningful question
- Decide a plan of action
- Gather your data
- Analyze the data
- Compare results
- Plan for future action

Example 1: Do online quizzes positively contribute to the learning environment?

Quiz Satisfaction Survey Response Category: Introductory Biology	No. Responses*
Helpful to learning material; good preparation for exams	20
Convenient/Like the freedom of choosing when to take the quiz	13
Not helpful to learning or neutral (not helpful or harmful)	33
Quizzes unfair or too difficult	39
Time constraint too stressful or unfair	14
Inconvenient / hard to remember to take quizzes outside of class time	11

Quiz Satisfaction Survey Response Category: Adv. Cell Biology	No. Responses*
Forces student to stay current on material for course	20
Helpful to learning material; good preparation for exams	40
Convenient/Like the freedom of choosing when to take the quiz	3
Too difficult or stressful to take quizzes online	25
Inconvenient / hard to remember to take quizzes outside of class time	5
Online examinations provide students with opportunity to cheat	1

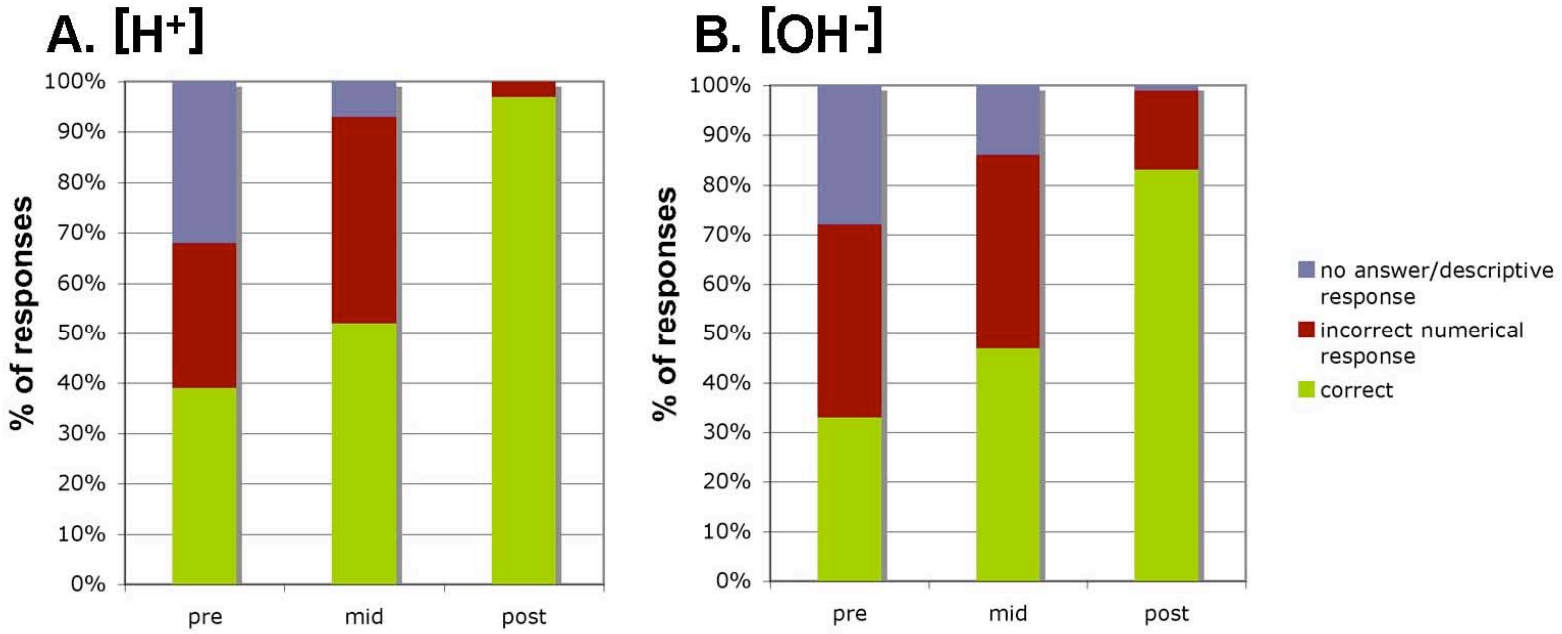
Example 2

- Will students engage in more productive online threaded discussion if they have more immediate feedback from the instructor?
- Are the comments I provide on student written work helpful in their learning? To what degree? How can they be more effective.

Example 3: Did a hands-on experimental design lab help student understanding of positive and negative controls?

	Catalase Assay Neg. Control			Isomorph 1	Isomorph 2
	Pre	**Mid**	**Post**	**Post**	**Post**
Leave out enzyme (correct)	36	72*	86‡	83	33
Describe positive control	5	3	2	15	4
Leave out substrate	10	18	10	1	33 (omit reporter enzyme)
Other incorrect	49	7	2	1	24
Incorrect mimic	(NA)	(NA)	(NA)	(NA)	5

Example 4: Do students really know what they should from prerequisites?



(Test question: Write the [H+] and [OH-] concentration of a pH = 2 solution).

Example 5: Does writing on the whiteboard better engage students than powerpoint?