Evolution of Pre and Post Assessment Quizzes for Use in Assessment

By Thomas Dilley and Emily Deaver, Environmental Science Program

A simple Pre- and Post- Assessment Quiz is an easy tool to implement in almost every course. For example, Tom Dilley uses a 16 question multiple choice quiz in his ENVS 101 Physical Geology Class (see attached) handed out the first day of class before any introduction. This can be scored and evaluated quickly to identify the students' incoming strengths and weaknesses. The exact same quiz is administered on the very last day of the semester and the results are easily compared to the pre-quiz (see attached handout). Emily Deaver uses a similar idea in her large ENVS 180 Introduction to Environmental Science Class, a 20 question quiz, posted in D2L that the students take the first week of class and again the last week of class (see attached questions). Deaver has tabulated and graphed the results from 2005 - 2012 quizzes for long term comparisons. Furthermore, as the next step in the assessment process, Deaver has used D2L to not only grade the quizzes but to tabulate the percentage wrong and right for each individual choice on the questions to identify common wrong answers and misconceptions. The third step in this process has been to compare the results from the pre- assessment quiz to the same questions on a cumulative final exam.

ENVS 101 Pre & Post-Quiz Assessment Tool Results
DILLEY
FALL 2012

CLASS AVERAGE

PRE-QUIZ: 53% **POST QUIZ: 78%**

Results for selected questions (*) reported below:

Place the letter of the **most appropriate** answer in the blank next to the question.

***_____** 1. The Scientific Method consists of

➔A. posing a question, developing a hypothesis, testing the hypothesis by gathering observations, refuting or supporting the hypothesis, developing Theories and models to explain the data, repeated testing and refinement.

B. proving your belief about how nature operates.

C. conducting experiments and calculations.

D. proving lab experiments.

PRE-QUIZ: 95% **POST-QUIZ: 100%**

_____ 2. Geology is

A. the study of rocks ➔B. the study of the Earth through time
C. the study of landforms D. based upon beliefs about creation

_____ 3. Minerals are

A. rocks B. never changing C. crystals
D. chemical compounds ➔E. chemicals with a specific crystalline structure

_____ 4. The three main classes of rocks are

A. quartz, sediments, & metamorphic B. sediments, volcanic, metamorphic
➔C. igneous, sedimentary, metamorphic D. volcanic, plutonic, sedimentary

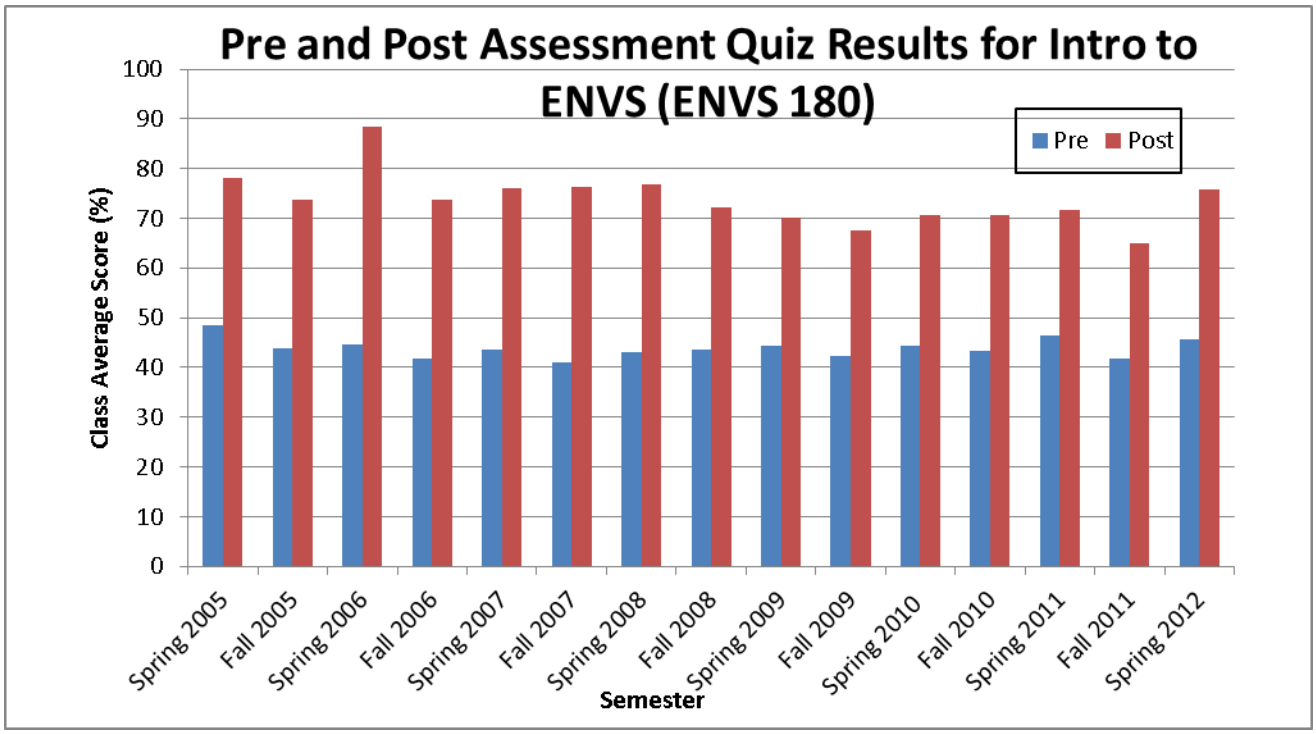
_____ 5. Plate Tectonics is responsible for

➔A. volcanoes, earthquakes, sea floor spreading & continental drift
B. radioactive decay C. evolution D. rock weathering

*_____ 6. The 100-year flood

A. can only happen once every hundred years B. is based on past discharges
C. has a 1% chance of happening any given year
D. is the biggest flood that can occur E. A & D ➔F. B & C
G. all of the above H. none of the above

PRE-QUIZ: 22% **POST-QUIZ: 57%**



Spring Semester 2012

Date of Quiz	*Class Average Score (%)*	*Range (%)*	*Percent of students failing quiz (less than 60%)*	*Percent of students with a 60% (or D) or better on quiz*	*Percent of students with a 70% (or C) or better on quiz*	*Number of students that took quiz*
PreTest (Jan 2012)	45.57	15-95	84.15	15.85	7.32	82
PostTest (May 2012)	75.7	45-100	12.68	87.32	69.01	71

Comparison of Pre-Assessment Quiz answers to answers on the Final Exam for Introduction to Environmental Science (ENVS 180) Spring 2012 (86 students took each test)

Correct Answer	Possible Answers	Pre-Quiz Results	Final Exam Results
	Natural selection means that		
	those organisms that are most fit, or healthier, will survive	30.23 %	15%
	individual organisms adapt to survive in changing environments	15.12 %	0%
	individuals select mates based on characteristics that will allow them to survive in changing environments	13.95 %	10%
	isolated populations branch off and become new species	1.16 %	0%
➡	members of a population have characteristics that allow them to survive and produce offspring more successfully than others	39.53 %	75%
	Which is the equation for photosynthesis?		
	$C_6H_{12}O_6 + 6\ H_2O + light = 6H_2O + 6CO_2$	12.79 %	2.5%
➡	$6CO_2 + 6H_2O + light = C_6H_{12}O_6 + 6O_2$	44.19 %	62.5%
	$C_6H_{12}O_6 + 6O_2 + light = 6H_2O + 6CO_2$	19.77 %	20%
	$6O_2 + 6CO_2 + light = C_6H_{12}O_6 + 6\ H_2O$	11.63 %	2.5%
	$6CO_2 + 6H_2O + light = C_6H_{12}O_6 + 6H_2O$	11.63 %	12.5%
	Biomagnification is a concentration of toxins		
	within certain cells of the body	24.42 %	17.5%
➡	as predators consume and store toxins stored in the bodies of their prey	20.93 %	77.5%
	within the liver as an organisms gets older	6.98 %	0%
	within the bodies of organisms at low trophic levels	25.58 %	5%
	I don't know	22.09 %	0%
	The most significant cause of extinction today is		
	overhunting and fishing	1.16 %	12.5%
➡	destruction of habitat	69.77 %	85%
	introduction of exotic species into areas where they do not naturally occur	5.81 %	0%
	environmental pollution	22.09 %	2.5%
	I don't know	1.16 %	0%