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## Starting at the End: Measuring Learning Using Retrospective Pre-Post Evaluations

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## Starting at the End: Measuring Learning Using Retrospective Pre-Post Evaluations

Hello! We are Debi Lang and Judy Savageau from the [Center for Health Policy and Research](#) at UMass Medical School. Earlier this year, Debi published a [post](#) on how program-specific learning objectives can help measure student learning to demonstrate program impact. Today's post shows how to measure whether training or professional development programs are meeting learning objectives using a retrospective pre-post methodology.

### Start at the End!

Using a traditional pre-and-then-post approach to measure student learning can suffer when students over or underestimate their knowledge/ability on the pre-test because we often "don't know what we don't know." Therefore, the difference between pre and post-program data may inaccurately reflect the true impact of the program.

Instead of collecting data at the beginning and end of the program, the **retrospective pre-post** approach measures students' learning only at the end by asking them to self-assess what they know from two viewpoints - BEFORE and AFTER participating. The responses can be compared to show changes in knowledge/skills.

Below is an example of the retrospective pre-post design excerpted from the evaluation of a class on American Sign Language (ASL) interpreting in health care settings. Students are self-assessing their knowledge based on statements reflecting the learning objectives.

For each of the topics listed below, please check the box under the number that indicates your level of knowledge both before and after completing the course:

- 1 = None - have no knowledge of the content
- 2 = Low - know very little about the content
- 3 = Moderate - have basic knowledge; there is more to learn
- 4 = High - consider myself very knowledgeable

How do you rate your knowledge about the following topics:	Knowledge BEFORE The Class				Knowledge AFTER The Class			
	1	2	3	4	1	2	3	4
<b>ANATOMY OF AN OFFICE VISIT</b>								
Q1. The names and roles of professionals in the health care system.								
Q2. The different types of health care encounters where patients and health care professionals meet.								
Q3. Various health care settings and their utilization.								

### Hot Tips:

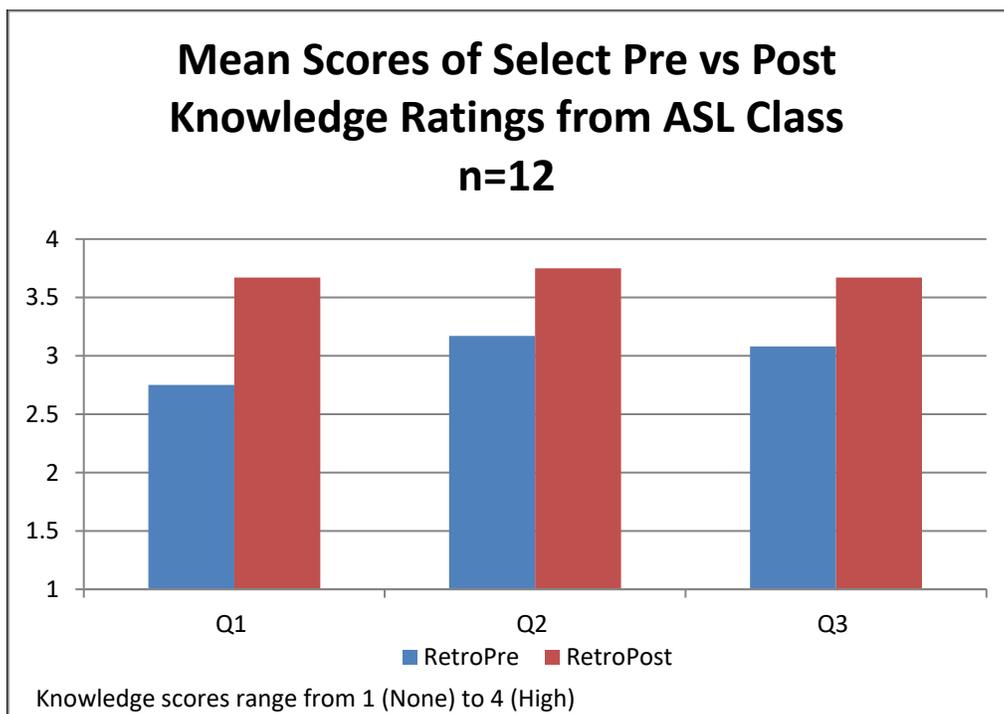
Here are some recommendations for designing a retrospective pre-post survey (as well as other training evaluation surveys):

- Write a brief statement at the top of the form stating the purpose of the evaluation along with general instructions on when, how and to whom to return completed forms, a confidentiality statement, and how responses will be used.
- Include space at the end to ask for comments on what worked and suggestions for improvement.
- Since many learners may not be familiar with the retrospective approach, use [plain language](#) so instructions are easily understood. This can be especially important for youth programs and when written or verbal instruction is not given in a student's native language.

**And Now for the Statistics...**

Generally, a simple paired t-test is used to compare mean pre and post scores. However, if sample sizes are too small such that the data are not normally distributed, the non-parametric equivalent of the paired t-test would typically be computed. To analyze the data from the ASL class, with a sample size of 12, we used the Wilcoxon signed-rank test. Below are the average class scores for the 3 measures.

How do you rate your knowledge about the following topics:	BEFORE		AFTER		Stat. Sig.
	Mean Score	Std. Dev.	Mean Score	Std. Dev.	Sig. (2-tailed)
<b>ANATOMY OF AN OFFICE VISIT</b>					
Q1. The names and roles of professionals in the health care system.	2.75	.62	3.67	.49	.000
Q2. The different types of health care encounters where patients and health care professionals meet.	3.17	.72	3.75	.45	.002
Q3. Various health care settings and their utilization.	3.08	.67	3.67	.49	.002



**Lessons Learned:**

Using a retrospective pre-post design allows for analysis of anonymous paired data, whereas the traditional pre-post approach requires linking the paired data to each student, which may compromise anonymity.

If follow-up data is collected (e.g., 6 months post-training) to measure sustainability of knowledge, additional analytic testing would require a plan to merge the two data files by some type of ID number.

**Rad Resources:**

- [What's the Difference? "Post then Pre" & "Pre then Post"](#)
- [The Retrospective Pretest: An Imperfect but Useful Tool](#)
- [Synthesis of Literature Relative to the Retrospective Pretest Design](#)