Improving Learning Assessment in Economics with Value-Added Analysis

William Walstad (U. of Nebraska-Lincoln) & Jamie Wagner (U. of Nebraska at Omaha)

1. A multiple-choice test with pre- & post items has 4 response patterns:
PL: positive learning   (0 pre & 1 post)
RL: retained learning (1 pre & 1 post)
NL: negative learning (1 pre & 0 post)
ZL: zero learning   (0 pre & 0 post)

2. Excel Program does analysis and creates graphs. Enter (0, 1) scores and group codes (1, 2, etc).

3. Post score = PL + RL
   a.   Analyze items
   b.   Analyze students
   c.   Analyze groups

4. Pre score = NL + RL
(analysis by item, group, student)

5. Difference score: PL – NL
(analysis by item, group, student)

6. Get overall results by test item.

See Walstad, W. B. & Wagner, J. (2016). The disaggregation of value-added test scores to assess learning outcomes in economics courses. *Journal of Economic Education*, *47*(2).

Posttest Scores = (Retained Learning + Positive Learning)

Posttest Score = (Retained + Positive Learning)
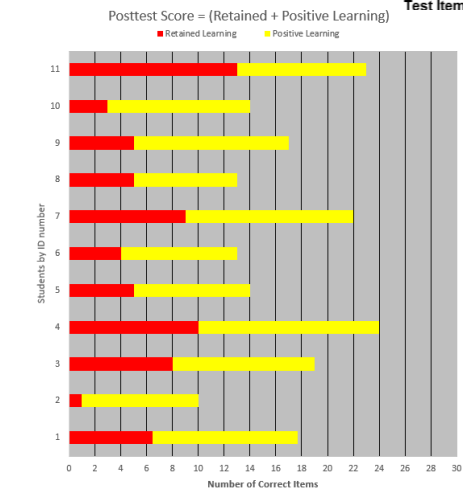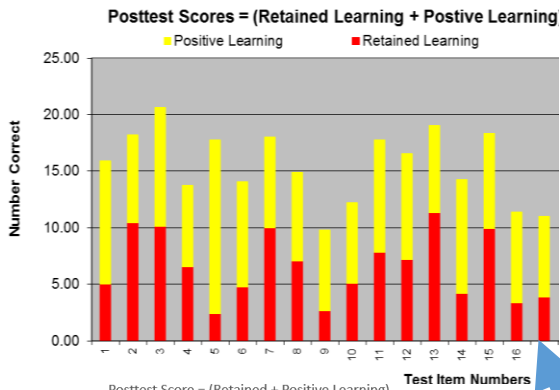
Postest Scores
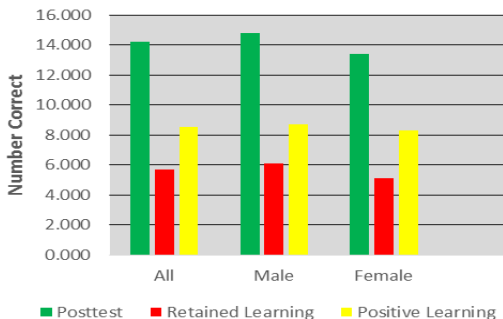
		Avg											
# C	17.700	24.00	17.50	23.50	25.00	16.00	28.50	22.50	16.50	10.50	21.00	19	
RL	6.467	11.00	8.50	8.50	2.50	7.50	5.50	16.00	2.50	3.50	11.00	2.	
PL	11.233	13.00	9.00	15.00	22.50	8.50	23.00	6.50	14.00	7.00	10.00	17	

		Avg											
Prop.	0.590	0.80	0.58	0.78	0.83	0.53	0.95	0.75	0.55	0.35	0.70	0.	
RL	0.216	0.37	0.28	0.28	0.08	0.25	0.18	0.53	0.08	0.12	0.37	0.	
PL	0.374	0.43	0.30	0.50	0.75	0.28	0.77	0.22	0.47	0.23	0.33	0.	

Key: #C = number correct; Prop. = Proportion Correct; RL

		Correct by Student		Prop. Correct by Student													
	Post	RL	PL	Post	RL	PL	1	2	3	4	5	6	7	8	9	10	
ID#	17.700	6.467	11.233	0.590	0.216	0.374											
1	10	1	9	0.33	0.03	0.30	1	0	0	0	1	1	0	0	1		
2	19	8	11	0.63	0.27	0.37	1	0	0	1	1	0	1	0	1		
3	24	10	14	0.80	0.33	0.47	1	1	1	1	1	1	1	1	1		
4	14	5	9	0.47	0.17	0.30	1	0	1	0	1	1	0	1	1		
5	13	4	9	0.43	0.13	0.30	1	0	0	1	0	1	1	0	1		
6	22	9	13	0.73	0.30	0.43	1	1	1	0	0	1	1	1	0		
7	13	5	8	0.43	0.17	0.27	1	1	1	1	1	1	0	0	1		
8	17	5	12	0.57	0.17	0.40	1	1	1	1	1	0	0	1	1		
9	14	3	11	0.47	0.10	0.37	0	1	1	1	0	1	0	1	1		
10	23	13	10	0.77	0.43	0.33	1	1	1	1	1	1	1	0	1		

	Test	Score	Proportion
1			
	Posttest	24.000	0.800
	Retained	11.000	0.367
	Postive	13.000	0.433
	Pretest	12.500	0.417
	Retained	11.000	0.367
	Negative	1.500	0.050
2	Posttest	17.50	0.58
	Retained	8.500	0.283
	Postive	9.000	0.300
	Pretest	12.000	0.400
	Retained	8.500	0.283
	Negative	3.500	0.117