Improving Learning Assessment in Economics with Value-Added Analysis
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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.